VHF DIGITAL BASE-REPEATER

# NXR-710

## SERVICE MANUAL

KENWOOD

Kenwood Corporation

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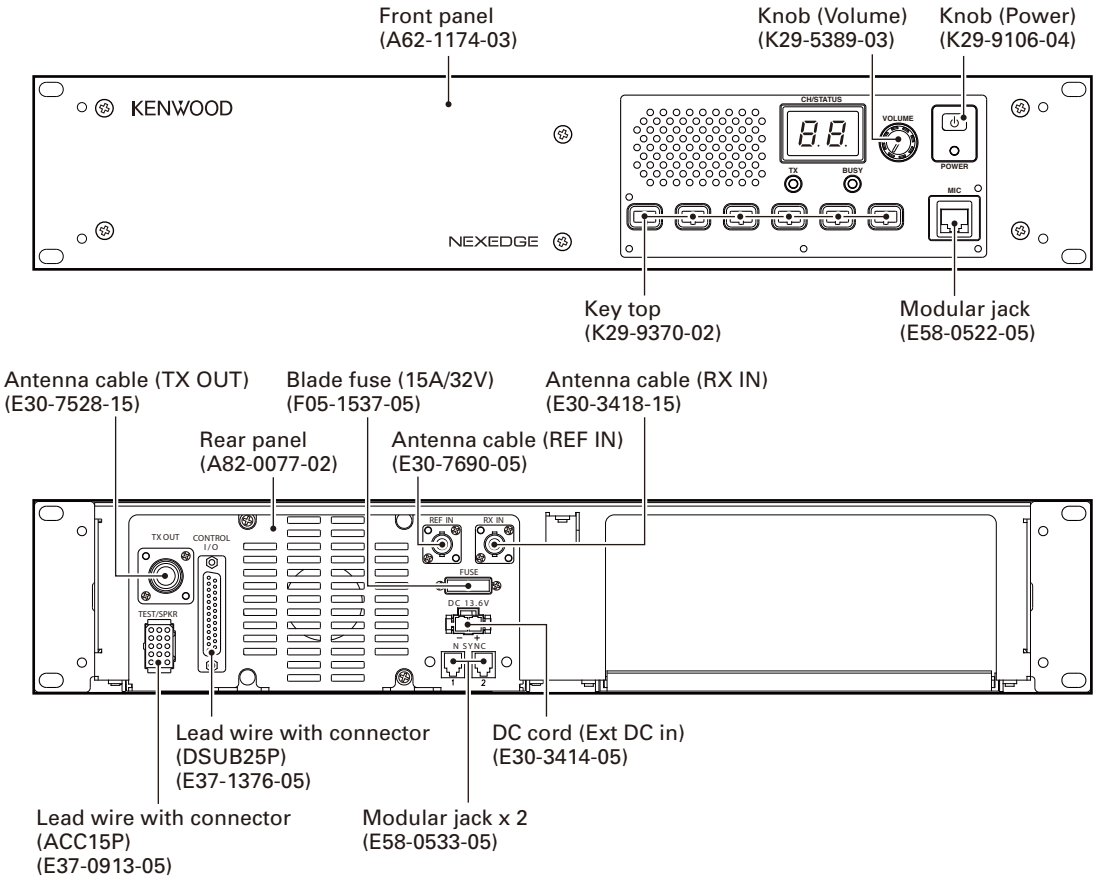


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This product complies with the **RoHS** directive for the European market.

LF

This product uses Lead Free solder.

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Transceivers containing AMBE+2™ Vocoder:

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

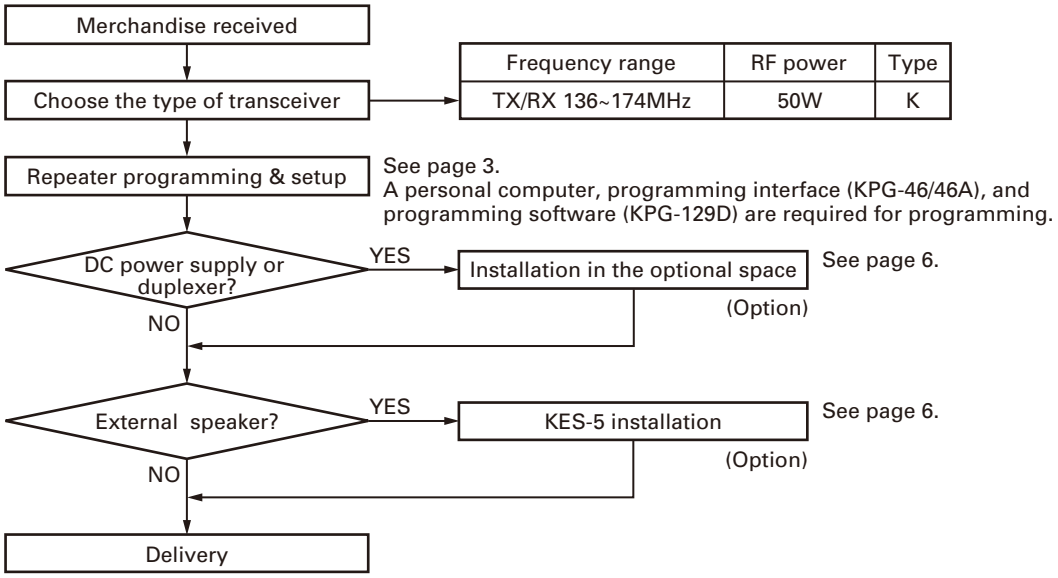
The following precautions are recommended for personal safety:

- 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

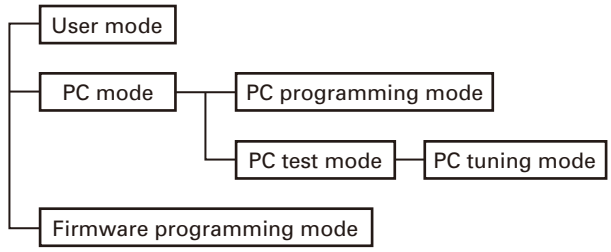
This transceiver is designed for easy servicing. Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained within.

# 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.

# 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 2000, XP or Vista (32-bit) 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.

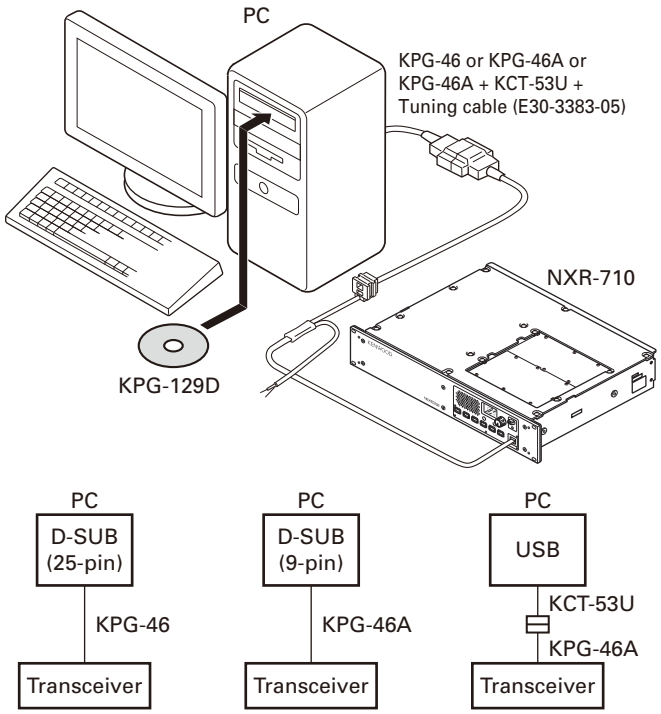



**Fig. 1**

## 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 3 to 6.

**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.

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# 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.: J5800-002 (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 (J5800-002) 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.

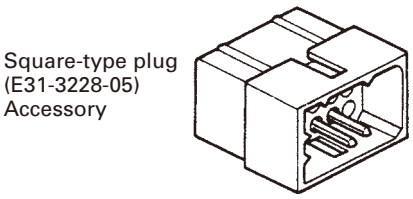


**Fig. 1-1**

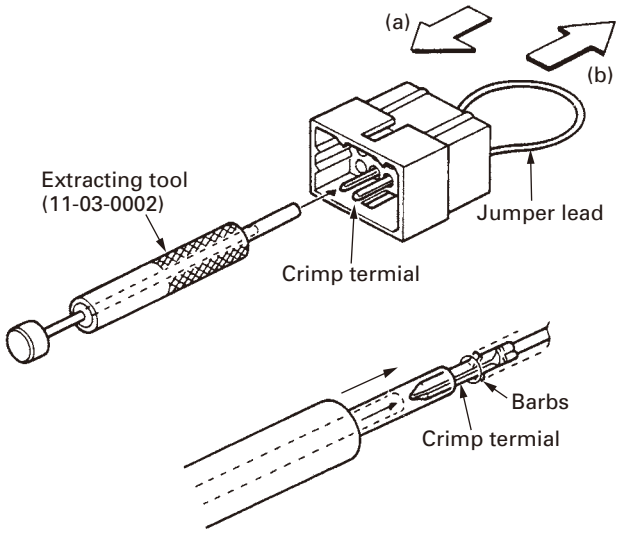


**Fig. 1-2**

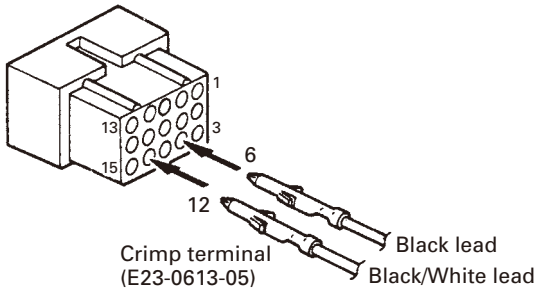


**Fig. 1-3**

## 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.



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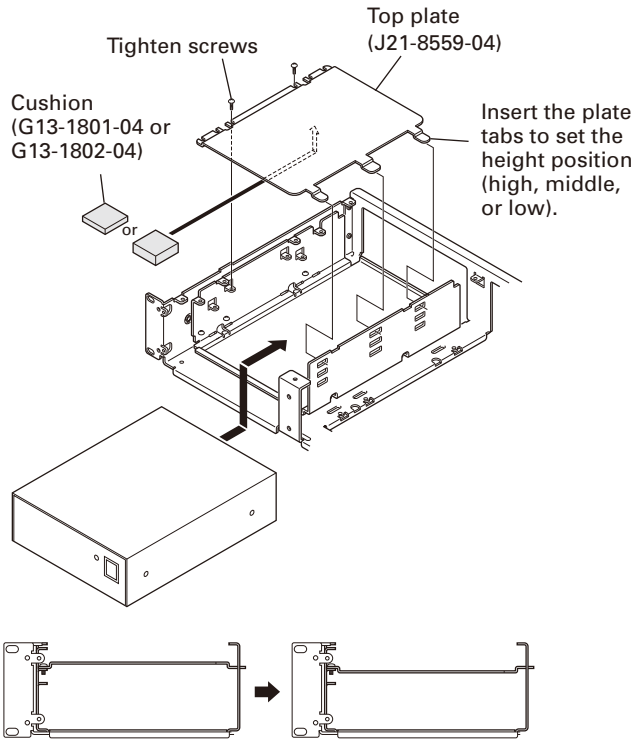
# INSTALLATION




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).

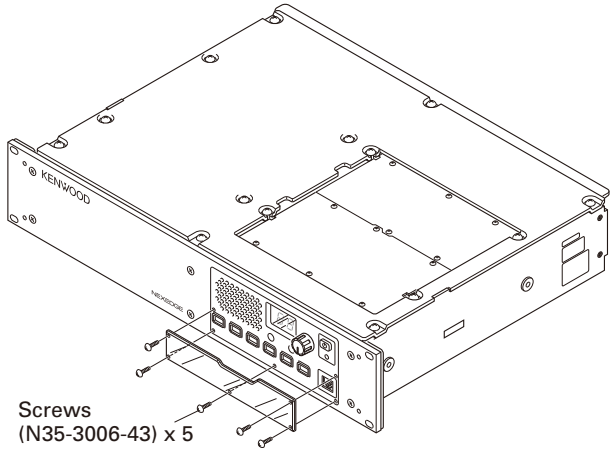



**Fig. 3**

## 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.

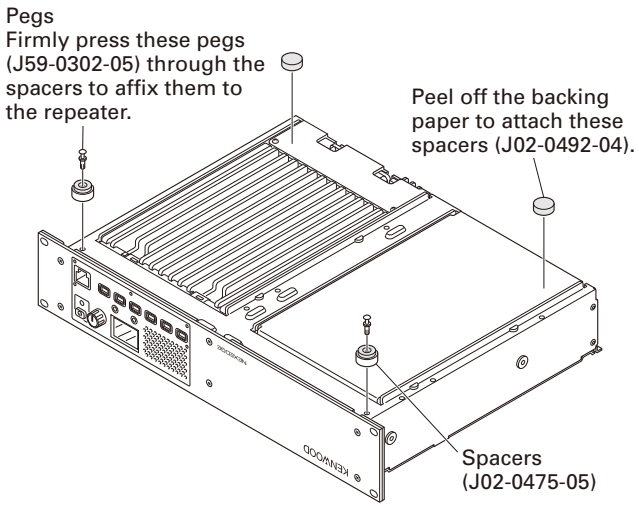



**Fig. 4**

## 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.

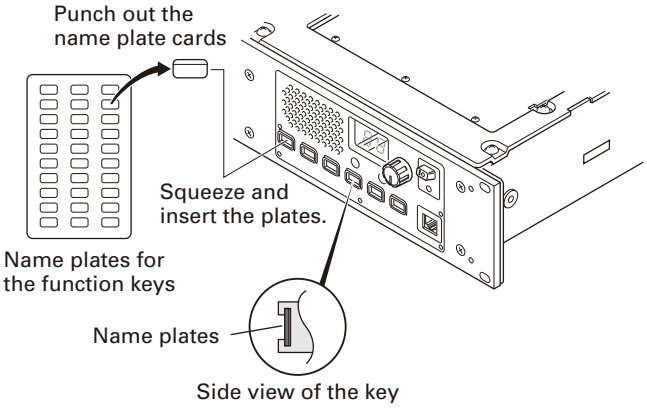



**Fig. 5**



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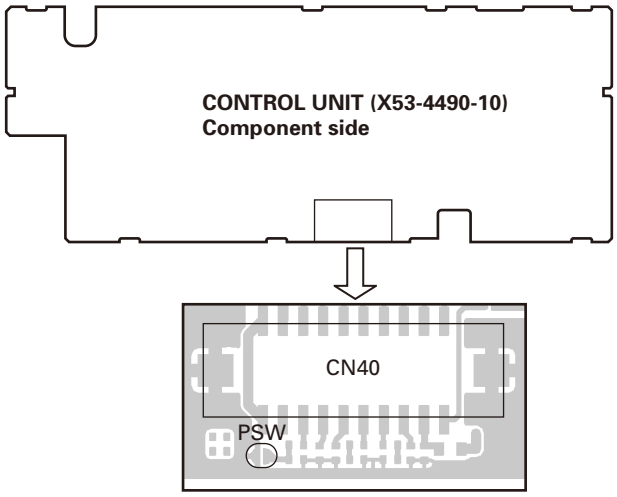
# MODIFICATION

## 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.

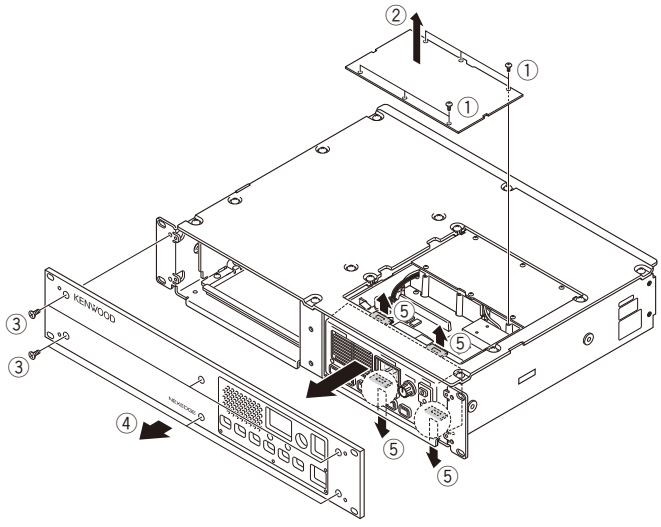


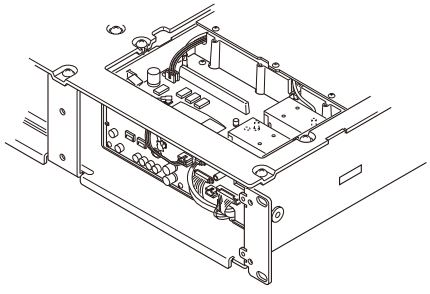

# DISASSEMBLY FOR REPAIR

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

**Note:** You can remove the panel assembly (ABS) without removing the top panel (A62-0840-03).

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.





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# 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 (X57-7940-10) 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.

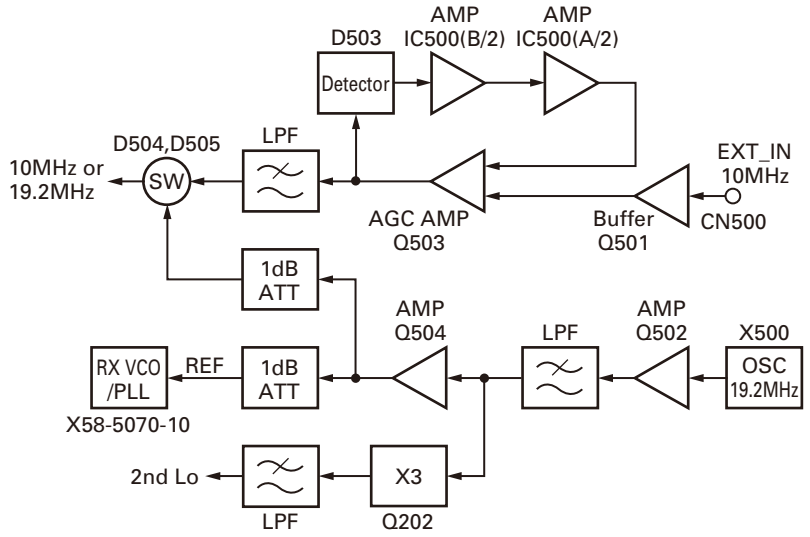


**Fig. 1 Internal/external reference circuit**

### 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.



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# CIRCUIT DESCRIPTION

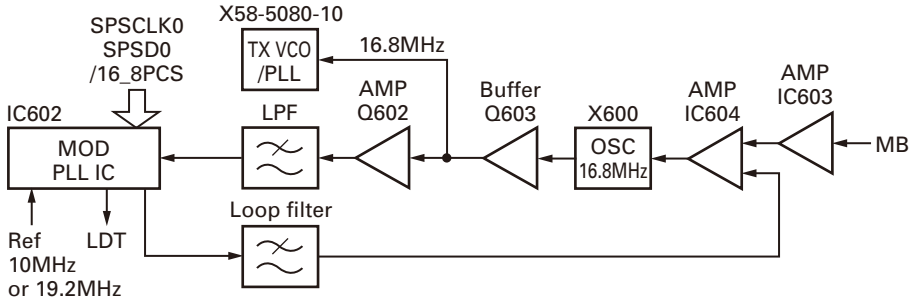


**Fig. 2 Transmitter reference 16.8MHz PLL circuit**

### 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 generates 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.

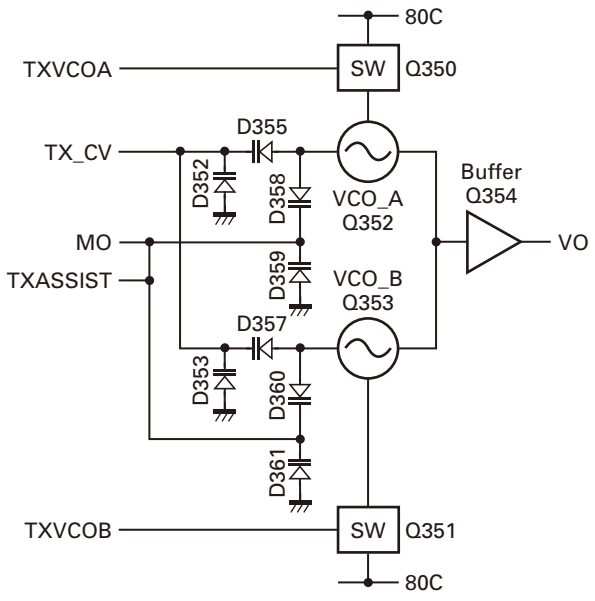


**Fig. 3 Transmitter VCO circuit**

#### ■ 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 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", "/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.

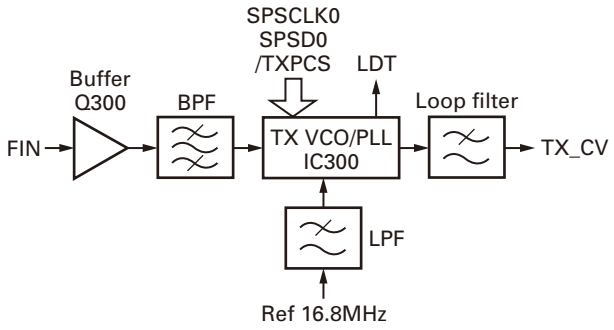


**Fig. 4 Transmitter Main PLL IC circuit**

### 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 Pin 14). 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



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# 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.

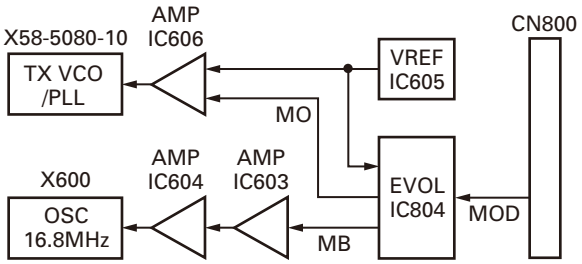


**Fig. 5 Modulation level adjustment circuit**

## 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.

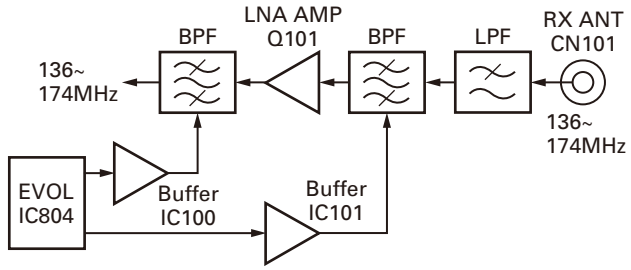


**Fig. 6 Front-end circuit**

## 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.

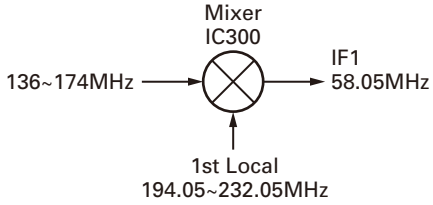


**Fig. 7 1st-Mixer circuit**

## 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

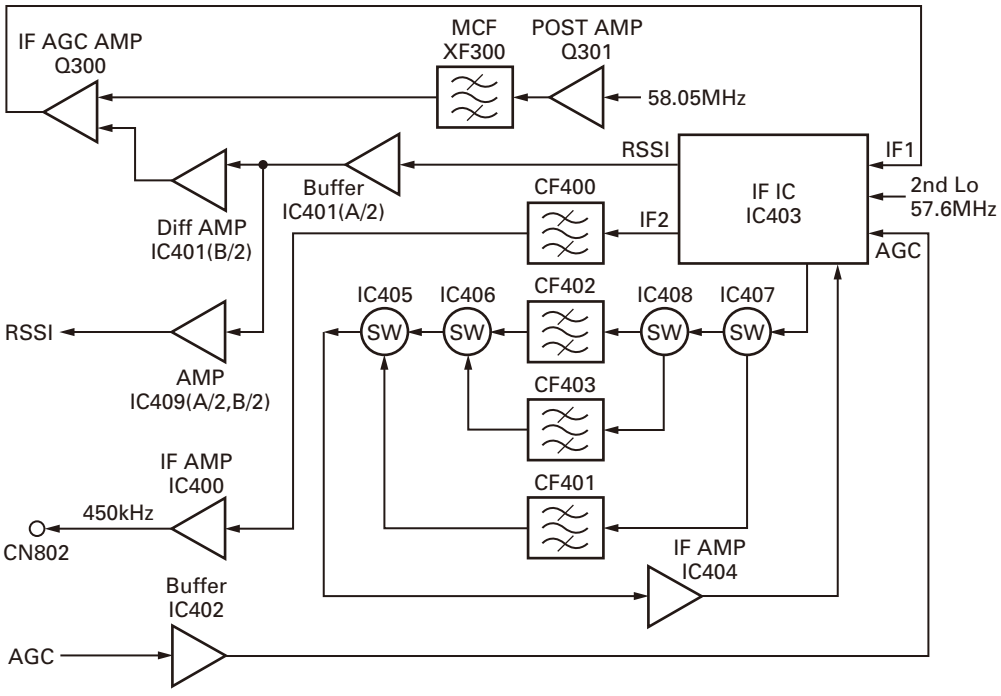


**Fig. 8 IF circuit**

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.

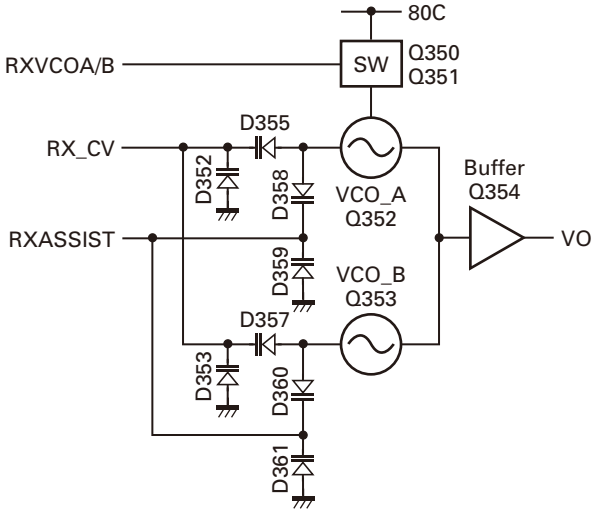


**Fig. 9 Receiver VCO circuit**

#### ■ 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.

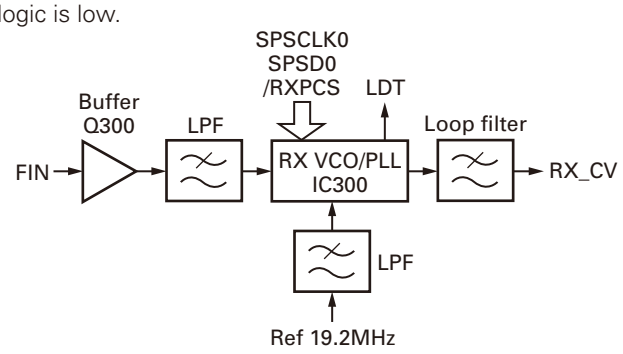


**Fig. 10 Receiver PLL circuit**

### 2-9. AVR circuit

The 13.6V 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 13.6V 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

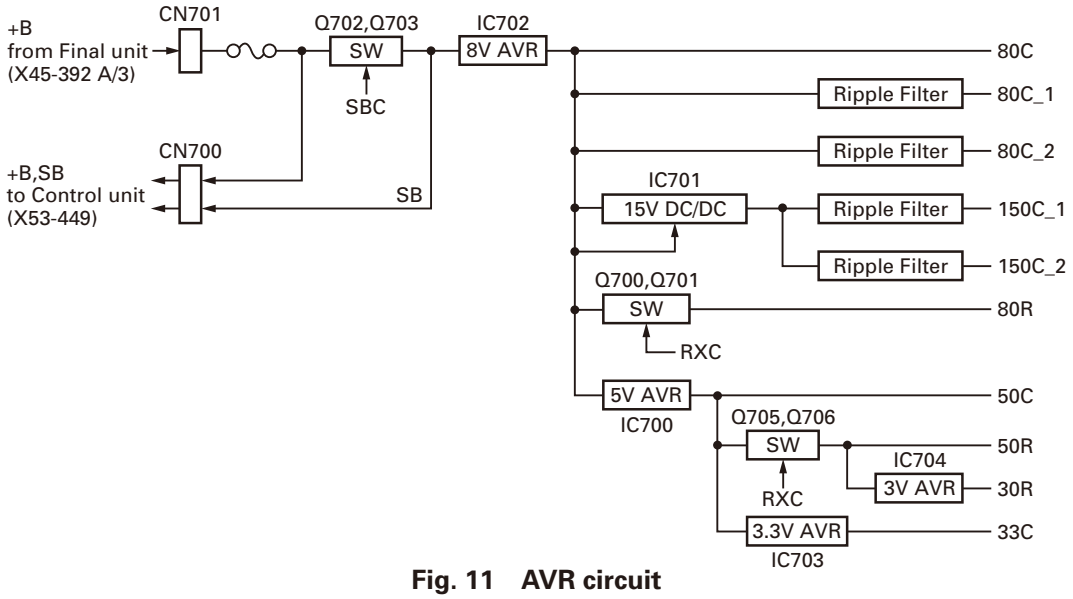


**Fig. 11 AVR circuit**

### 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 (X45-3920-10) 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.

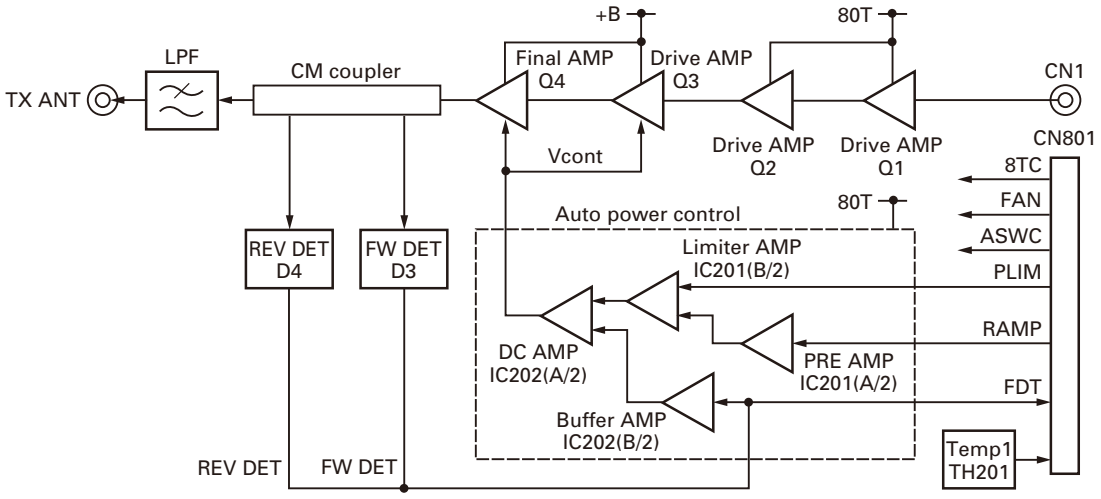


**Fig. 12 Driver and Final power amplifier circuit**

# 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 stabilizers 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 13.6V power source (+B) is provided through connector CN201 to the Final unit (X45-392 A/3). +B is connected to CN203 to supply the 13.6V 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.

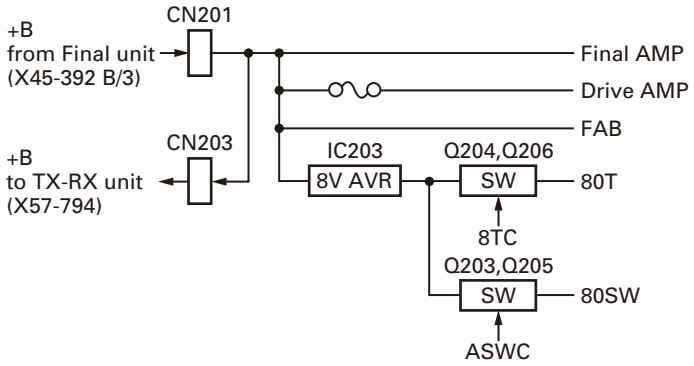


**Fig. 13 AVR circuit**

## 4. Control unit

The Control unit (X53-4490-10) 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.

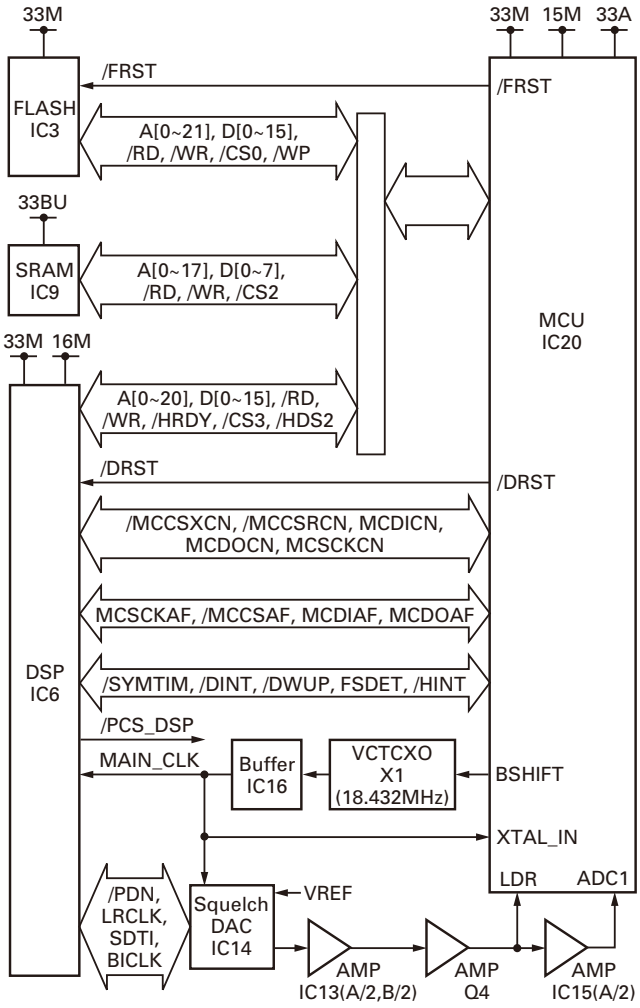


**Fig. 14 Control circuit**

### 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 13.6V to 6.0V. This 13.6V 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.



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# 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.

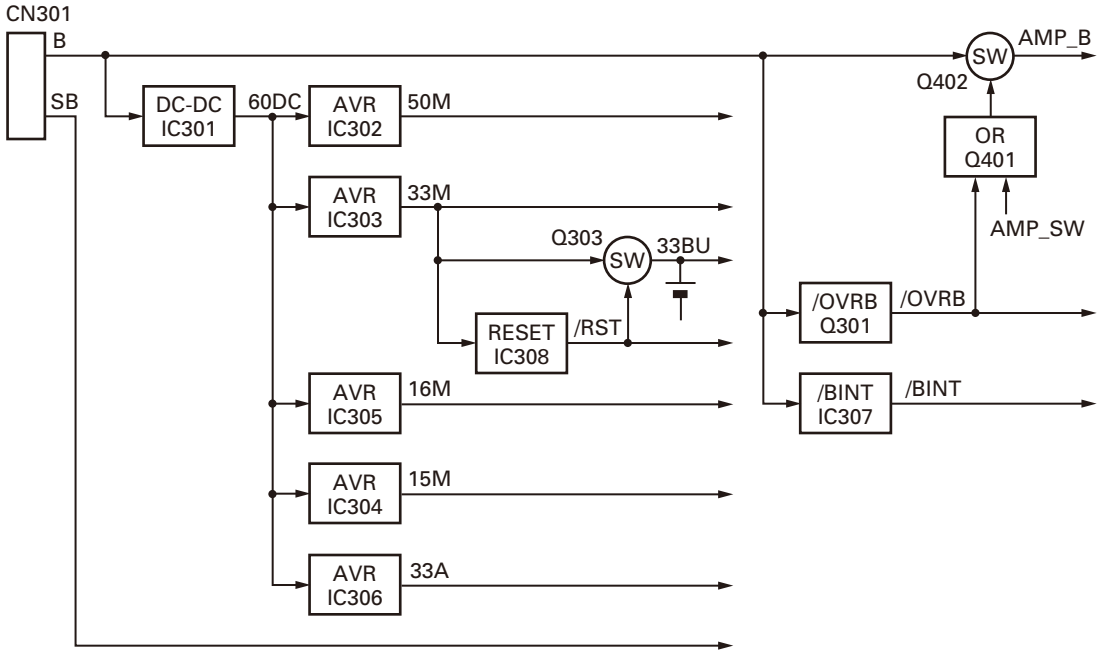


**Fig. 15 Power supply circuit**

### 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 13.6V and a 4Ω load.

#### ■ Microphone circuit

The signal from the microphone is passed through the AGC circuit located in the Display unit (X54-358 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 (X54-358 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.



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# CIRCUIT DESCRIPTION

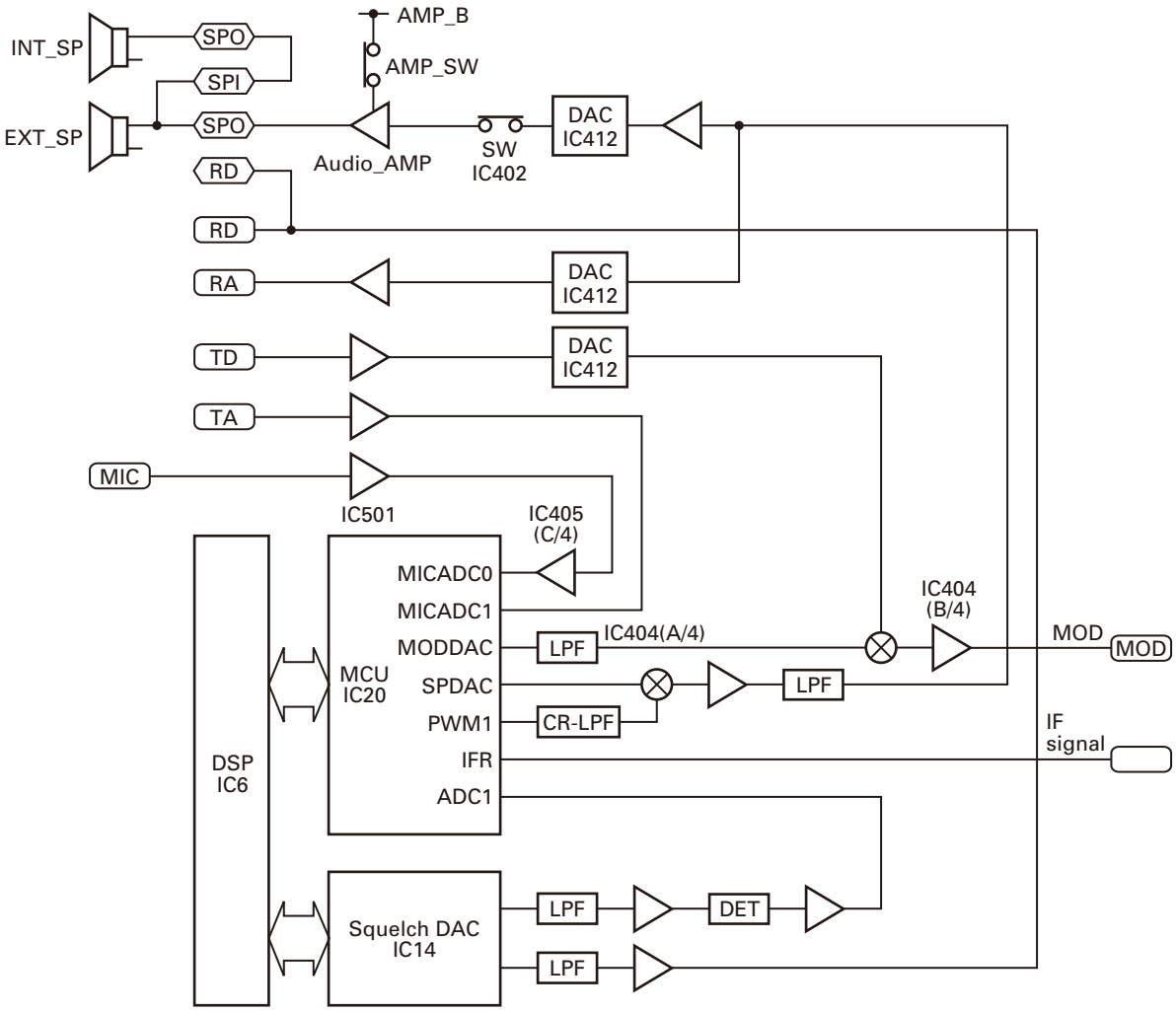


**Fig. 16 Modulation circuit (Analog/Digital signal processing)**

## 5. Display unit

The Display unit (X54-3580-20) is the same circuit as X54-3580-20, used in TKR-750/850/751/851.

The Display unit (X54-3580-20) consists of the following circuits:

(1) LED circuit

(2) Key switch circuit

### 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 LEDs.

### 5-2. Key switch circuit

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

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



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# COMPONENTS DESCRIPTION

### FINAL UNIT (X45-3920-10)

| Ref. No. | Part Name | Description |
|---|---|---|
| IC201,202 | MOS-IC | DC amplifier |
| IC203 | Analogue 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 |
| D7,8 | 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 | ROM IC | Flash memory |
| IC4,5 | MOS-IC | RS-485 transceiver |
| IC6 | Microprocessor IC | DSP |
| IC7,8 | MOS-IC | Buffer |
| IC9 | SRAM IC | SRAM |
| IC10,11 | MOS-IC | Buffer |
| IC12 | MOS-IC | AND gate |
| IC13 | MOS-IC | AF amplifier |
| IC14 | MOS-IC | CODEC |
| IC15 | MOS-IC | AF amplifier |
| IC16 | MOS-IC | Buffer amplifier |
| IC17 | MOS-IC | RTC IC |
| IC18,19 | MOS-IC | Buffer |
| IC20 | MOS-IC | MCU |
| IC21 | MOS-IC | RS-232C driver/receiver |
| IC22 | MOS-IC | I/O expander |
| IC23 | MOS-IC | NAND gate |
| IC24 | MOS-IC | AND gate |
| IC25 | MOS-IC | OR gate |
| IC26 | MOS-IC | AND gate |
| IC27,28 | MOS-IC | AF amplifier |
| IC301 | Analogue IC | DC/DC converter |
| IC302 | MOS-IC | Voltage regulator |
| IC303~306 | Analogue IC | Voltage regulator |
| IC307 | MOS-IC | Voltage regulator |
| IC308 | Analogue IC | Voltage regulator |

| Ref. No. | Part Name | Description |
|---|---|---|
| IC401 | MOS-IC | NAND gate |
| IC402 | MOS-IC | Analog switch |
| IC403 | Bi-polar IC | AF power amplifier |
| IC404~406 | Bi-polar IC | OP AMP |
| IC407 | MOS-IC | Analog switch |
| IC411 | Bi-polar IC | OP AMP |
| IC412 | MOS-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 (X54-3580-20)

| Ref. No. | Part Name | Description |
|---|---|---|
| IC501 | MOS IC | MIC amplifier |
| IC502~505 | MOS IC | Shift register |
| IC506,507 | MOS IC | Voltage regulator |
| Q501,502 | Transistor | Level controller |
| Q503,504 | FET | DC switch |
| Q506 | Transistor | DC switch |



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# COMPONENTS DESCRIPTION

| Ref. No. | Part Name | Description |
|---|---|---|
| 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 (X57-7940-10)

| Ref. No. | Part Name | Description |
|---|---|---|
| IC100,101 | MOS-IC | OP AMP |
| IC200,201 | MOS-IC | OP AMP |
| IC203 | MOS-IC | Buffer |
| IC300 | MOS-IC | Mixer |
| IC400 | MOS-IC | IF amplifier |
| IC401 | MOS-IC | Buffer amplifier |
| IC402 | MOS-IC | OP AMP |
| IC403 | MOS-IC | IF system |
| IC404 | MOS-IC | IF amplifier |
| IC405~408 | MOS-IC | Analog switch |
| IC409 | MOS-IC | Buffer amplifier |
| IC500 | MOS-IC | Buffer amplifier |
| IC501 | MOS-IC | OP AMP |
| IC600,601 | MOS-IC | Buffer |
| IC602 | MOS-IC | 16.8MHz PLL |
| IC603~607 | MOS-IC | OP AMP |
| IC608 | MOS-IC | AF amplifier |
| IC700~702 | Analogue IC | Voltage regulator |
| IC703,704 | Bi-polar IC | Voltage regulator |
| IC800 | MOS-IC | Temperature sensor |
| IC801 | MOS-IC | OP AMP |
| IC802 | ROM IC | EEPROM |
| IC803 | MOS-IC | Buffer amplifier |
| IC804 | MOS-IC | Digital potentiometer |
| IC805 | MOS-IC | I/O expander |
| IC806 | MOS-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 |
| 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)

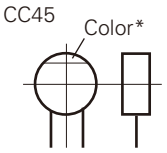
| Ref. No. | Part Name | Description |
|---|---|---|
| IC300 | IC | PLL |
| Q300 | Transistor | Buffer amplifier |
| Q350,351 | FET | DC switch |
| Q352,353 | FET | VCO OSC |
| Q354 | Transistor | Buffer amplifier |
| D352,353 | Varicap | Frequency control |
| D355 | Varicap | Frequency control |
| D357~361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

# PARTS LIST

## CAPACITORS

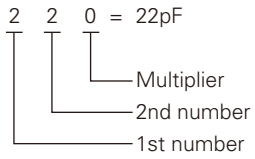
| CC | 45 | TH | 1H | 220 | J |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |

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<br>–20 | +80<br>–20 | +100<br>–0 | More than 10μF : –10~+50<br>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 / 1st word | A | B | C | D | E | F | G | H | J | K | V |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | – |

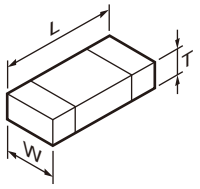
**• Chip capacitors**

(EX) CC 73 F SL 1H 000 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) CK 73 F F 1H 000 Z
1 2 3 4 5 6 7
(Chip) (B, F)

Refer to the table above.
1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

**• 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 |

## RESISTORS

**• Chip resistor (Carbon)**

(EX) RD 73 E B 2B 000 J
1 2 3 4 5 6 7
(Chip) (B, F)

**• Carbon resistor (Normal type)**

(EX) RD 14 B B 2C 000 J
1 2 3 4 5 6 7

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

**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 |

**• 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 | | |



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# PARTS LIST

✻ New Parts. ⚠indicates safety critical components.
Parts without **Parts No.** are not supplied.
Les articles non mentionnes 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 (X45-3920-10)**

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| **NXR-710** | | | | | |
| 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 | ✻ | B62-2199-00 | INSTRUCTION MANUAL | |
| 11 | 2C,3D | ✻ | B72-2596-04 | 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 | | E37-1340-15 | FLAT CABLE | |
| 29 | 2C | | E37-1376-05 | LEAD WIRE WITH CONNECTOR (DSUB25P) | |
| 30 | 2C | ✻ | E37-1473-05 | LEAD WIRE WITH CONNECTOR (X45-X53) | |
| 32 | 1C,1E | | F05-1537-05 | BLADE FUSE (15A/32V) ACCESSORY | |
| 33 | 2C | | F09-0445-05 | CAP (DSUB) | |
| 34 | 1C | | F09-0471-15 | FANMOTOR | |
| - | | | F10-2409-04 | SHIELDING CASE (X57 TX-RX PCB) | |
| 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) | |
| 45 | 1B | ✻ | G02-1856-04 | EARTH SPRING (FUSE) | |
| 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 | 1F | | G13-1801-04 | CUSHION (40X40X5) ACCESSORY | |
| 51 | 1F | | G13-1802-04 | CUSHION (40X40X10) ACCESSORY | |
| 52 | 2B | | G13-1886-04 | CUSHION (BNC) | |
| 54 | 1E | | H25-0029-04 | PROTECTION BAG (60/110/0.07) | |
| 55 | 1F | | H25-0747-04 | PROTECTION BAG (250X350) | |
| 56 | 1E | | H25-0762-04 | PROTECTION BAG (120X300) | |
| 57 | 1F | | H25-2328-04 | PROTECTION BAG (80/250/0.07) | |
| 58 | 1F | ✻ | H52-2334-02 | ITEM CARTON CASE | |
| 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 | |
| 65 | 2C | ✻ | J21-8616-04 | MOUNTING HARDWARE (X45:MODULAR) | |
| 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:EXT DC IN) | |
| 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 | | T07-0770-35 | SPEAKER | |
| 80 | 3A | | W09-0971-05 | LITHIUM CELL | |
| - | | | 490-0174-05 | ADHESIVE TAPE | |
| **FINAL UNIT (X45-3920-10)** | | | | | |
| C4 | | | CK73GB1H104K | CHIP C 0.10UF K | |
| C5-7 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C10 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C12 | | | CC73GCH1H180J | CHIP C 18PF J | |
| C14 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C16-18 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C19 | | | CC73FCH1H120J | CHIP C 12PF 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 | | | CC73FCH1H390J | CHIP C 39PF J | |
| C27 | | | CC73FCH1H560J | CHIP C 56PF J | |
| C28 | | | CK73FB1H102K | CHIP C 1000PF K | |
| C33 | | | C93-0603-05 | CHIP C 1000PF K | |
| C34 | | ✻ | C93-1744-05 | CHIP C 470PF J | |
| C37 | | | CK73GB1E105K | CHIP C 1.0UF K | |
| C43 | | | CC73GCH1H220J | CHIP C 22PF J | |

# PARTS LIST

**FINAL UNIT (X45-3920-10)**

| Ref. No. | Address | New parts | Parts No. | Description | | | Destination |
|---|---|---|---|---|---|---|---|
| C44 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C45 | | | C93-0603-05 | CHIP C | 1000PF | K | |
| C51 | | | C93-0603-05 | CHIP C | 1000PF | K | |
| C52 | | ✻ | C93-0868-15 | MICA | 240PF | J | |
| C53 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C54 | | ✻ | C93-1747-05 | CHIP C | 130PF | J | |
| C57 | | ✻ | C93-1800-05 | CHIP C | 82PF | J | |
| C60 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C61 | | | CC73GCH1H220J | CHIP C | 22PF | J | |
| C63 | | ✻ | C93-1790-05 | CHIP C | 33PF | 500WV | |
| C65 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C66 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C68 | | | CM73F2H471J | CHIP C | 470PF | J | |
| C69 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C71 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C75 | | | C93-0603-05 | CHIP C | 1000PF | K | |
| C78 | | | CM73F2H471J | CHIP C | 470PF | J | |
| C80 | | | CC73FCH1H270J | CHIP C | 27PF | J | |
| C82 | | | C93-0563-05 | CHIP C | 18PF | J | |
| C84 | | | C93-0562-05 | CHIP C | 15PF | J | |
| C88 | | ✻ | C93-1788-05 | CHIP C | 27PF | 500WV | |
| C89 | | ✻ | C93-1784-05 | CHIP C | 18PF | 500WV | |
| C91 | | ✻ | C93-1788-05 | CHIP C | 27PF | 500WV | |
| C92 | | ✻ | C93-1786-05 | CHIP C | 22PF | 500WV | |
| C94 | | | C93-0564-05 | CHIP C | 22PF | J | |
| C97 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C98 | | | C93-0564-05 | CHIP C | 22PF | J | |
| C99 | | | CC73FCH1H050C | CHIP C | 5.0PF | C | |
| C201 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C205 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C206 | | | CK73GB1H104K | CHIP C | 0.10UF | K | |
| C207 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C210 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C216 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C218 | | | CK73GB1H104K | CHIP C | 0.10UF | K | |
| C219 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C220 | | ✻ | CD04AZ1V100M | ELECTRO | 10UF | 35WV | |
| C221,222 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C223 | | | CD04AZ1V102M | ELECTRO | 1000UF | 35WV | |
| C224 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C225 | | | CK73GB1H104K | CHIP C | 0.10UF | K | |
| C229-238 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C239 | | | CD04BD1H101M | ELECTRO | 100UF | 50WV | |
| C240 | | | CC73GCH1H220J | CHIP C | 22PF | J | |
| C241-244 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C245 | | | CC73GCH1H220J | CHIP C | 22PF | J | |
| C246 | | | CK73GB1H104K | CHIP C | 0.10UF | K | |
| C247-253 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C301,302 | | | CK73GB1H471K | CHIP C | 470PF | K | |
| CN1 | | | E04-0154-05 | PIN SOCKET | | | |
| CN2,3 | | | E23-1262-05 | TERMINAL | | | |
| CN4,5 | | | E23-1330-05 | TERMINAL | | | |
| CN201,202 | | | E23-0462-05 | TERMINAL | | | |
| CN203 | | | E41-2672-05 | PIN ASSY | | | |
| CN204 | | | E41-2743-05 | PIN ASSY | | | |
| CN205 | | | E41-1682-05 | PIN ASSY | | | |
| J401,402 | | | E58-0533-05 | MODULAR JACK | | | |
| F1 | | | F53-0392-05 | FUSE (3A) | | | |

| Ref. No. | Address | New parts | Parts No. | Description | | | | Destination |
|---|---|---|---|---|---|---|---|---|
| CN301 | | | J13-0071-05 | FUSE HOLDER | | | | |
| L3 | | | L41-5678-14 | SMALL FIXED INDUCTOR (56NH) | | | | |
| L4 | | | L41-6878-14 | SMALL FIXED INDUCTOR (68NH) | | | | |
| L5 | | | L41-2778-14 | SMALL FIXED INDUCTOR (27NH) | | | | |
| L6 | | | L41-1278-14 | SMALL FIXED INDUCTOR (12NH) | | | | |
| L7 | | | L41-1878-14 | SMALL FIXED INDUCTOR (18NH) | | | | |
| L8 | | | L92-0179-05 | CHIP FERRITE | | | | |
| L9 | | | L34-4520-05 | AIR-CORE COIL | | | | |
| L10 | | ✻ | L34-4560-05 | AIR-CORE COIL | | | | |
| L11 | | ✻ | L34-4557-05 | AIR-CORE COIL | | | | |
| L12,13 | | | L41-2785-14 | SMALL FIXED INDUCTOR (270NH) | | | | |
| L14 | | | L34-4667-05 | AIR-CORE COIL | | | | |
| L15 | | | L34-4744-05 | AIR-CORE COIL | | | | |
| L16-18 | | | L34-4520-05 | AIR-CORE COIL | | | | |
| L19 | | | L40-1085-92 | SMALL FIXED INDUCTOR (100NH) | | | | |
| R2 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R6 | | | RK73GB2A472J | CHIP R | 4.7K | J | 1/10W | |
| R7 | | | RK73GB2A102J | CHIP R | 1.0K | J | 1/10W | |
| R8 | | | RK73FB2B330J | CHIP R | 33 | J | 1/8W | |
| R9 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R10 | | | RK73FB2B271J | CHIP R | 270 | J | 1/8W | |
| R11 | | | RK73FB2B270J | CHIP R | 27 | J | 1/8W | |
| R12 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R14 | | | RK73GB2A220J | CHIP R | 22 | J | 1/10W | |
| R15 | | | RK73GB2A472J | CHIP R | 4.7K | J | 1/10W | |
| R16 | | | RK73GB2A102J | CHIP R | 1.0K | J | 1/10W | |
| R17 | | | RK73FB2B100J | CHIP R | 10 | J | 1/8W | |
| R18 | | | RK73GB2A471J | CHIP R | 470 | J | 1/10W | |
| R19 | | | RK73FB2B272J | CHIP R | 2.7K | J | 1/8W | |
| R20 | | | RK73FB2B220J | CHIP R | 22 | J | 1/8W | |
| R21 | | | RK73FB2B271J | CHIP R | 270 | J | 1/8W | |
| R23 | | | RK73FB2B180J | CHIP R | 18 | J | 1/8W | |
| R24 | | | RK73FB2B271J | CHIP R | 270 | J | 1/8W | |
| R25 | | | RK73EB2E470J | CHIP R | 47 | J | 1/4W | |
| R26 | | | RK73FB2B154J | CHIP R | 150K | J | 1/8W | |
| R27 | | | RK73FB2B104J | CHIP R | 100K | J | 1/8W | |
| R28,29 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R30 | | | RK73RB2H101J | CHIP R | 100 | J | 1/2W | |
| R31,32 | | | RK73FB2B104J | CHIP R | 100K | J | 1/8W | |
| R33 | | | RK73GB2A823J | CHIP R | 82K | J | 1/10W | |
| R34,35 | | | RK73FB2B000J | CHIP R | 0.0 | J | 1/8W | |
| R36 | | | RK73FB2B820J | CHIP R | 82 | J | 1/8W | |
| R38 | | | RK73FB2B000J | CHIP R | 0.0 | J | 1/8W | |
| R39 | | | RK73GB2A101J | CHIP R | 100 | J | 1/10W | |
| R40 | | | RK73FB2B000J | CHIP R | 0.0 | J | 1/8W | |
| R41 | | | RK73FB2B820J | CHIP R | 82 | J | 1/8W | |
| R42 | | ✻ | RK73PB2H121J | CHIP R | 120 | J | 1/2W | |
| R43 | | | RK73FB2B224J | CHIP R | 220K | J | 1/8W | |
| R44 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R201 | | | RK73GB2A333J | CHIP R | 33K | J | 1/10W | |
| R202 | | | RK73GB2A104J | CHIP R | 100K | J | 1/10W | |
| R203 | | | RK73GB2A473J | CHIP R | 47K | J | 1/10W | |
| R204 | | | RK73GB2A273J | CHIP R | 27K | J | 1/10W | |
| R205,206 | | | RK73GB2A104J | CHIP R | 100K | J | 1/10W | |
| R207 | | | RK73GB2A154J | CHIP R | 150K | J | 1/10W | |
| R208 | | | RK73GB2A101J | CHIP R | 100 | J | 1/10W | |
| R210 | | | RK73GB2A104J | CHIP R | 100K | J | 1/10W | |
| R213 | | | RK73GB2A564J | CHIP R | 560K | J | 1/10W | |
| R215 | | | RK73GB2A563J | CHIP R | 56K | J | 1/10W | |



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# PARTS LIST

FINAL UNIT (X45-3920-10)
CONTROL UNIT (X53-4490-10)

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| R217 | | | RK73GB2A154J | CHIP R 150K J 1/10W | |
| R218,219 | | | RK73GB2A104J | CHIP R 100K J 1/10W | |
| R220 | | | RK73GB2A224J | CHIP R 220K J 1/10W | |
| R221 | | | RK73GB2A183J | CHIP R 18K J 1/10W | |
| R225 | | | RK73GB2A000J | CHIP R 0.0 J 1/10W | |
| R226 | | | RK73GB2A332J | CHIP R 3.3K J 1/10W | |
| R228,229 | | | RK73GB2A473J | CHIP R 47K J 1/10W | |
| R230,231 | | | RK73GB2A472J | CHIP R 4.7K J 1/10W | |
| R232,233 | | | RK73GB2A474J | CHIP R 470K J 1/10W | |
| R235,236 | | | RK73PB2H100J | CHIP R 10 J 1/2W | |
| R237 | | | RK73GB2A123J | CHIP R 12K J 1/10W | |
| R351 | | | RK73GB2A000J | CHIP R 0.0 J 1/10W | |
| R354 | | | RK73GB2A000J | CHIP R 0.0 J 1/10W | |
| D1 | | | 1SS226-F | DIODE | |
| D3,4 | | | HSM88AS-E | DIODE | |
| D7,8 | | | L7091CER | DIODE | |
| D9 | | | CSA70-401L | SURGE ABSORBER | |
| D10 | | | MA2S111-F | DIODE | |
| D201 | | | 02DZ6.2F-Y | ZENER DIODE | |
| D202 | | | 22ZR-10D | SURGE ABSORBER | |
| D203 | | | 1SS355 | DIODE | |
| D301 | | | DSA3A1 | DIODE | |
| IC201,202 | | | TA75W01FUF | MOS-IC | |
| IC203 | | | NJM78M08FA-ZB | ANALOGUE IC | |
| Q1,2 | | | 2SC3357-A | TRANSISTOR | |
| Q3 | 2B | | PD55003S-E | FET | |
| Q4 | 2B | | RD70HVF1-101 | FET | |
| Q203,204 | | | 2SJ484 | FET | |
| Q205,206 | | | SSM3K15TE(F) | FET | |
| Q207 | | | DTD123EK | DIGITAL TRANSISTOR | |
| TH201 | | | S1R103J440H | THERMISTOR | |

## CONTROL UNIT (X53-4490-10)

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| C7-10 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C11 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C12-15 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C18,19 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C20 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C21,22 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C23-30 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C31 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C32,33 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C34 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C35,36 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C38 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C39 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C40 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C41-45 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C46 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C47 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C49 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C50 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C51 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C52 | | | CC73HCH1H270J | CHIP C 27PF J | |
| C56,57 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C58 | | | CK73HB1H681K | CHIP C 680PF K | |
| C60,61 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C62,63 | | | CK73FB0J106K | CHIP C 10UF K | |
| C64 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C65 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C66 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C67 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C68 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C69 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C70 | | | CK73HB1A224K | CHIP C 0.22UF K | |
| C72 | | | CK73HB1A224K | CHIP C 0.22UF K | |
| C73 | | | CC73HCH1H470J | CHIP C 47PF J | |
| C74 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C75 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C76 | | | CC73HCH1H470J | CHIP C 47PF J | |
| C77 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C79,80 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C81 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C82,83 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C84-86 | | | CK73HB1H682K | CHIP C 6800PF K | |
| C87 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C88 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C89 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C90 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C91 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C92 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C93 | | | CS77CP0J100M | CHIP TNTL 10UF 6.3WV | |
| C94 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C95,96 | | | CC73HCH1H020C | CHIP C 2.0PF C | |
| C97 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C98-100 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C101 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C102 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C103 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C104-107 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C108 | | | CC73HCH1H020C | CHIP C 2.0PF C | |
| C109 | | | CS77CP0J100M | CHIP TNTL 10UF 6.3WV | |
| C110,111 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C112 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C114 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C115-119 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C120 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C121 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C122-126 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C127 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C128 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C129 | | | CK73HB1H102K | CHIP C 1000PF 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 | |
| C137 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C138 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C139 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C140 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C141,142 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C143 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C144-146 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C147 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C148 | | | CK73HB1H122K | CHIP C 1200PF K | |
| C149 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C150 | | | CK73HB1E103K | CHIP C 0.010UF K | |

**If a part reference number is listed in a shaded box, that part does not come with the PCB.**



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# PARTS LIST

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

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| C151-155 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C156 | | | CC73HCH1H221J | CHIP C 220PF J | |
| C157 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C158 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C159 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C160 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C161 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C162 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C164 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C166 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C167 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C170,171 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C175,176 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C179,180 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C182 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C184,185 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C186 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C187 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C188 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C189 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C190 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C191 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C192 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C193 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C194-197 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C198 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C199 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C200 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C201 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C202 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C203 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C205 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C206 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C207 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C209-212 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C213 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C215,216 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C218 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C219-223 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C224 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C225,226 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C227 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C228,229 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C230 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C232 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C233 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C235 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C237 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C239 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C240-242 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C243 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C244 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C245,246 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C247 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C249 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C250 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C252 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C254 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C256 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C257 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C258 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C259,260 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C301,302 | | | C92-0905-05 | OS-CON 47UF 35WV | |
| C303,304 | | ✻ | C93-1810-05 | CHIP C 4.7UF 50WV | |
| C306 | | | CK73HB1H471K | CHIP C 470PF K | |
| C308 | | | CK73EB1H474K | CHIP C 0.47UF K | |
| C310,311 | | | CE32AU1C330M | CHIP EL 33UF 16WV | |
| C312 | | | CE32BM1E470M | CHIP EL 47UF 25WV | |
| C313 | | | CK73HB1E223K | CHIP C 0.022UF K | |
| C314 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C315-317 | | | CE32BM1E470M | CHIP EL 47UF 25WV | |
| C318-321 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C322 | | | CE32BM1E470M | CHIP EL 47UF 25WV | |
| C323 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C324 | | | CE32BM1E470M | CHIP EL 47UF 25WV | |
| C325,326 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C327-329 | | | CE32BM1E470M | CHIP EL 47UF 25WV | |
| C330,331 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C332 | | | CE32BM1E470M | CHIP EL 47UF 25WV | |
| C333 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C334 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C335 | | | CK73HB1H471K | CHIP C 470PF K | |
| C336 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C337 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C401 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C402 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C403 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C404 | | | C90-4120-05 | ELECTRO 470UF 35WV | |
| C405 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C406,407 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C408,409 | | | C93-0912-05 | CHIP C 100UF M | |
| C410 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C412 | | | CK73FB0J106K | CHIP C 10UF K | |
| C413 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C414 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C415 | | | CD04AY1E470M | ELECTRO 47UF 25WV | |
| C416 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C417 | | | CK73HB1H222K | CHIP C 2200PF K | |
| C418 | | | CC73HCH1H391J | CHIP C 390PF J | |
| C419 | | | CK73HB1H152K | CHIP C 1500PF K | |
| C420 | | | CC73HCH1H221J | CHIP C 220PF J | |
| C421 | | | CK73FB0J106K | CHIP C 10UF K | |
| C422 | | | CD04AY1E470M | ELECTRO 47UF 25WV | |
| C423 | | | CK73HB1H471K | CHIP C 470PF K | |
| C424 | | | CC73HCH1H331J | CHIP C 330PF J | |
| C425 | | | CD04AY1E470M | ELECTRO 47UF 25WV | |
| C426 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C427 | | | CK73HB1H471K | CHIP C 470PF K | |
| C428 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C429 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C430 | | | C92-0777-05 | ELECTRO 1000UF 25WV | |
| C432 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C433 | | | CC73HCH1H181J | CHIP C 180PF J | |
| C434,435 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C436 | | | CC73HCH1H221J | CHIP C 220PF J | |
| C438 | | | C93-0912-05 | CHIP C 100UF M | |
| C441 | | | C93-0912-05 | CHIP C 100UF M | |
| C442 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C443 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C445 | | | CK73HB1A105K | CHIP C 1.0UF K | |



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# PARTS LIST

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

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| C446 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C450,451 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C455 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C456 | | | CC73HCH1H221J | CHIP C 220PF J | |
| C457 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C459 | | | CC73HCH1H221J | CHIP C 220PF J | |
| C460-462 | | | CK73HB1A104K | CHIP C 0.10UF K | |
| C463 | | | CC73HCH1H331J | CHIP C 330PF J | |
| C464 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C465 | | | CK73HB1H152K | CHIP C 1500PF K | |
| C466 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C469 | | | CK73HB1A105K | CHIP C 1.0UF K | |
| C470,471 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C472,473 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| CN5 | | | E41-1481-05 | PIN ASSY | |
| CN38 | | | E40-6656-05 | PIN ASSY | |
| CN39 | | | E04-0193-05 | PIN SOCKET | |
| CN40 | | | E40-6102-05 | PIN ASSY | |
| CN41 | | ✻ | E41-3086-05 | PIN ASSY | |
| CN42 | | ✻ | E41-3090-05 | PIN ASSY | |
| CN43 | | | E41-2671-05 | PIN ASSY | |
| CN44 | | | E40-5960-05 | PIN ASSY | |
| CN301 | | | E41-2672-05 | PIN ASSY | |
| CN302 | | | J19-5386-05 | HOLDER (LITHIUM CELL) | |
| L1 | | | L92-0467-05 | CHIP FERRITE | |
| L2,3 | | | L33-1500-05 | CHOKE COIL | |
| L4 | | | L92-0467-05 | CHIP FERRITE | |
| L5-7 | | | L92-0162-05 | BEADS CORE | |
| L8 | | | L92-0639-05 | CHIP FERRITE | |
| L9-11 | | | L92-0467-05 | CHIP FERRITE | |
| L14-16 | | | L92-0467-05 | CHIP FERRITE | |
| L17 | | | L92-0639-05 | CHIP FERRITE | |
| L18 | | | L92-0162-05 | BEADS CORE | |
| L20 | | | L92-0162-05 | BEADS CORE | |
| L22,23 | | ✻ | L92-0171-05 | BEADS CORE | |
| L301-304 | | | L92-0639-05 | CHIP FERRITE | |
| L305 | | ✻ | L33-1541-05 | SMALL FIXED INDUCTOR | |
| L306-309 | | | L92-0467-05 | CHIP FERRITE | |
| L311 | | | L92-0162-05 | BEADS CORE | |
| L312 | | | L92-0467-05 | CHIP FERRITE | |
| L313,314 | | | L92-0639-05 | CHIP FERRITE | |
| L315-317 | | | L92-0467-05 | CHIP FERRITE | |
| X1 | | | L77-3015-05 | TCXO (18.432MHZ) | |
| X2 | | | L77-1802-05 | CRYSTAL RESONATOR (32768HZ) | |
| CP1-8 | | ✻ | RK74HB1J334J | CHIP-COM 330K J 1/16W | |
| R3-9 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R10-13 | | | RK73EB2E101J | CHIP R 100 J 1/4W | |
| R14 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R15 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R18 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R22,23 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R24 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R25,26 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R27,28 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R29 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R30 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R32,33 | | | RK73HB1J472J | CHIP R 4.7K J 1/16W | |
| R34-36 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R37 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| R38 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R40-42 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R43-50 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R51 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R52 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R53-57 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R58 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R59-61 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R62 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R63 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R64,65 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R66-73 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R74,75 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R77 | | | RK73HB1J151J | CHIP R 150 J 1/16W | |
| R78 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R79 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R80 | | | RK73HB1J823J | CHIP R 82K J 1/16W | |
| R81-83 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R85 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R87 | | | RK73HB1J334J | CHIP R 330K J 1/16W | |
| R88 | | | RK73HB1J100J | CHIP R 10 J 1/16W | |
| R89 | | | RK73HB1J332J | CHIP R 3.3K J 1/16W | |
| R90 | | | RK73HB1J471J | CHIP R 470 J 1/16W | |
| R92-94 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R95 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R99,100 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R101 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R102,103 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R104 | | | RK73HB1J393J | CHIP R 39K J 1/16W | |
| R105 | | | RK73HB1J334J | CHIP R 330K J 1/16W | |
| R106 | | | RK73HB1J100J | CHIP R 10 J 1/16W | |
| R107 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R108 | | | RK73HB1J184J | CHIP R 180K J 1/16W | |
| R109 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R110 | | | RK73HB1J682J | CHIP R 6.8K J 1/16W | |
| R111,112 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R113 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R114,115 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R116,117 | | | RK73HB1J472J | CHIP R 4.7K J 1/16W | |
| R118 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R119 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R121 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R122 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R123 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R124 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R126 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R127 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R128 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R129,130 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R131 | | | RK73HB1J472J | CHIP R 4.7K J 1/16W | |
| R132 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R133 | | | RK73HB1J472J | CHIP R 4.7K J 1/16W | |
| R135 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R137,138 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R141,142 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R143,144 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R145 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R146,147 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R148 | | | RK73HB1J563J | CHIP R 56K J 1/16W | |
| R149-151 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |



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# PARTS LIST

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

| Ref. No. | Address | New parts | Parts No. | Description | | | | Destination |
|---|---|---|---|---|---|---|---|---|
| R152 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R153 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R154,155 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R156,157 | | | RK73HB1J474J | CHIP R | 470K | J | 1/16W | |
| R159 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R160 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R161 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R162 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R163 | | | RK73HH1J334D | CHIP R | 330K | D | 1/16W | |
| R164 | | | RK73HH1J104D | CHIP R | 100K | D | 1/16W | |
| R165,166 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R167-169 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R170 | | | RK73HH1J124D | CHIP R | 120K | D | 1/16W | |
| R171 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R172 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R173,174 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R175 | | | RK73HB1J683J | CHIP R | 68K | J | 1/16W | |
| R176-178 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R179 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R180-183 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R184 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R185 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R186 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R187 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R190 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R191 | | | RK73HB1J474J | CHIP R | 470K | J | 1/16W | |
| R194 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R196,197 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R199 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R204 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R205-208 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R209 | | | RK73HB1J121J | CHIP R | 120 | J | 1/16W | |
| R210 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R211,212 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R213-219 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R220 | | | RK73HB1J471J | CHIP R | 470 | J | 1/16W | |
| R221 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R222 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R223 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R224 | | | RK73HB1J121J | CHIP R | 120 | J | 1/16W | |
| R225 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R226 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R227-230 | | | RK73HB1J122J | CHIP R | 1.2K | J | 1/16W | |
| R231-238 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R241-253 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R254 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R255-262 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R263 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R265,266 | | | RK73HB1J471J | CHIP R | 470 | J | 1/16W | |
| R267 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R268 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R269 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R270-275 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R276 | | | RK73HB1J471J | CHIP R | 470 | J | 1/16W | |
| R277 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R278,279 | | | RK73HB1J471J | CHIP R | 470 | J | 1/16W | |
| R280 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R281 | | | RS14KB3D5R6J | FL-PROOF RS | 5.6 | J | 2W | |
| R282 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R301,302 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R303 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R304 | | | RK73HB1J223J | CHIP R | 22K | J | 1/16W | |
| R305 | | | RK73HB1J183J | CHIP R | 18K | J | 1/16W | |
| R306 | | | RK73HH1J184D | CHIP R | 180K | D | 1/16W | |
| R307 | | | RK73HH1J273D | CHIP R | 27K | D | 1/16W | |
| R308 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R309 | | | RK73PB2H220J | CHIP R | 22 | J | 1/2W | |
| R310 | | | RK73GB2A220J | CHIP R | 22 | J | 1/10W | |
| R312 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R313 | | | RK73HH1J822D | CHIP R | 8.2K | D | 1/16W | |
| R314 | | | RK73HH1J332D | CHIP R | 3.3K | D | 1/16W | |
| R315 | | | RK73HB1J471J | CHIP R | 470 | J | 1/16W | |
| R316 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R317,318 | | | RK73HB1J472J | CHIP R | 4.7K | J | 1/16W | |
| R319 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R320 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R321 | | | RK73HH1J272D | CHIP R | 2.7K | D | 1/16W | |
| R322 | | | RK73HH1J473D | CHIP R | 47K | D | 1/16W | |
| R323 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R324 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R401 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R402 | | | RK73HB1J472J | CHIP R | 4.7K | J | 1/16W | |
| R403 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R404 | | | RK73HB1J472J | CHIP R | 4.7K | J | 1/16W | |
| R405 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R406,407 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R408,409 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R410 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R411 | | | RK73HB1J472J | CHIP R | 4.7K | J | 1/16W | |
| R412 | | | RK73HB1J123J | CHIP R | 12K | J | 1/16W | |
| R413 | | | RK73HB1J223J | CHIP R | 22K | J | 1/16W | |
| R414 | | | RK73HB1J153J | CHIP R | 15K | J | 1/16W | |
| R415 | | | RK73HB1J123J | CHIP R | 12K | J | 1/16W | |
| R416 | | | RK73HB1J224J | CHIP R | 220K | J | 1/16W | |
| R417,418 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R419 | | | RK73HB1J105J | CHIP R | 1.0M | J | 1/16W | |
| R420 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R421 | | | RK73HB1J393J | CHIP R | 39K | J | 1/16W | |
| R422 | | | RK73HB1J223J | CHIP R | 22K | J | 1/16W | |
| R423 | | | RK73HB1J471J | CHIP R | 470 | J | 1/16W | |
| R424 | | | RK73HB1J153J | CHIP R | 15K | J | 1/16W | |
| R425 | | | RK73HB1J223J | CHIP R | 22K | J | 1/16W | |
| R426 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R430 | | | RK73HB1J2R7J | CHIP R | 2.7 | J | 1/16W | |
| R431 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R432 | | | RK73HB1J333J | CHIP R | 33K | J | 1/16W | |
| R433 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R435 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R436 | | | RK73HB1J124J | CHIP R | 120K | J | 1/16W | |
| R437 | | | RK73HB1J333J | CHIP R | 33K | J | 1/16W | |
| R438 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R439 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R441 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R442 | | | RK73HB1J683J | CHIP R | 68K | J | 1/16W | |
| R443 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R444,445 | | | RK73HB1J333J | CHIP R | 33K | J | 1/16W | |
| R446 | | | RK73HB1J224J | CHIP R | 220K | J | 1/16W | |
| R450 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R451 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R452 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |



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# PARTS LIST

**CONTROL UNIT (X53-4490-10)**
**DISPLAY UNIT (X54-3580-20)**

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| R457 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R458-460 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R461-463 | | | RK73HB1J223J | CHIP R 22K J 1/16W | |
| R464,465 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R466,467 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R502 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R508 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R509 | | | RK73HB1J223J | CHIP R 22K J 1/16W | |
| R510 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R511 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| D1 | | | RB706F-40 | DIODE | |
| D2 | | | MA2S111-F | DIODE | |
| D3 | | | 1SS388F | DIODE | |
| D4-11 | | | DA204U | DIODE | |
| D12 | | | 1SS355 | DIODE | |
| D13 | | | 02DZ18F-X | ZENER DIODE | |
| D14-16 | | | DA204U | DIODE | |
| D18 | | | DA204U | DIODE | |
| D20 | | | DA204U | DIODE | |
| D22 | | | DA204U | DIODE | |
| D23 | | | 1SS355 | DIODE | |
| D24 | | | 02DZ18F-X | ZENER DIODE | |
| D26 | | | DA204U | DIODE | |
| D28 | | | DA204U | DIODE | |
| D29 | | | 1SS355 | DIODE | |
| D30 | | | 02DZ18F-X | ZENER DIODE | |
| D31 | | | 1SS355 | DIODE | |
| D32 | | | 02DZ18F-X | ZENER DIODE | |
| D35 | | | 1SS355 | DIODE | |
| D36 | | | 02DZ18F-X | ZENER DIODE | |
| D37 | | | SMD185F-2 | VARISTOR | |
| D301 | | ✻ | RSX301L-30 | DIODE | |
| D302 | | | 1SS388F | DIODE | |
| D303 | | | 02DZ18F-X | ZENER DIODE | |
| D304,305 | | | 1SS388F | DIODE | |
| D401 | | | 1SS388F | DIODE | |
| IC3 | | ✻ | E29PL03270TIP | ROM IC | |
| IC4,5 | | ✻ | ISL8485EIBZ | MOS-IC | |
| IC6 | | | **Note 1** | MICROPROCESSOR IC | |
| IC7,8 | | | TC7WT125FUF | MOS-IC | |
| IC9 | | | **Note 1** | SRAM IC | |
| IC10,11 | | | TC7SH125FU-F | MOS-IC | |
| IC12 | | | TC7SH08FU-F | MOS-IC | |
| IC13 | | | TC75W51FK(F) | MOS-IC | |
| IC14 | | ✻ | AK4386VTP | MOS-IC | |
| IC15 | | | TC75W51FK(F) | MOS-IC | |
| IC16 | | | SM5023CNDH-G | MOS-IC | |
| IC17 | | ✻ | R2023T | MOS-IC | |
| IC18 | | ✻ | TC74VHCT244AFK | MOS-IC | |
| IC19 | | | TC7MBD3245AFK | MOS-IC | |
| IC20 | | | **Note 1** | MOS-IC | |
| IC21 | | | ADM101EARMZ | MOS-IC | |
| IC22 | | ✻ | MCP23017TE/ML | MOS-IC | |
| IC23 | | | TC7WT125FUF | MOS-IC | |
| IC24 | | | TC7SH08FU-F | MOS-IC | |
| IC25 | | | TC7SH32FU-F | MOS-IC | |
| IC26 | | | TC7SET08FU-F | MOS-IC | |
| IC27 | | | TC75W51FK(F) | MOS-IC | |
| IC28 | | | TC75S51FE(F) | MOS-IC | |
| IC301 | | ✻ | LT3685EMSE | ANALOGUE IC | |

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| IC302 | | | XC6201P502PR | MOS-IC | |
| IC303 | | | XC6204B332P1 | ANALOGUE IC | |
| IC304 | | | XC6205B152PRN | ANALOGUE IC | |
| IC305 | | ✻ | XC6205B162PR | ANALOGUE IC | |
| IC306 | | | XC6204B332P1 | ANALOGUE IC | |
| IC307 | | | XC61CN2702N | MOS-IC | |
| IC308 | | | XC6109C29ANN | ANALOGUE IC | |
| IC401 | | | TC7SH00FU-F | MOS-IC | |
| IC402 | | | TC7S66FUF | MOS-IC | |
| IC403 | 3B | | LA4422 | BI-POLAR IC | |
| IC404 | | | NJM2732V | BI-POLAR IC | |
| IC405 | | | NJM2734V | BI-POLAR IC | |
| IC406 | | | NJM2732V | BI-POLAR IC | |
| IC407 | | | TC7W53FK(F) | MOS-IC | |
| IC411 | | | NJM2734V | BI-POLAR IC | |
| IC412 | | | M62364FP-F | MOS-IC | |
| Q4 | | | 2SC4617(S) | TRANSISTOR | |
| Q5 | | | SSM3K15TE(F) | FET | |
| Q6-10 | | | 2SD2114K(W) | TRANSISTOR | |
| Q301 | | | RT1N441U-T111 | TRANSISTOR | |
| Q302 | | | SSM3K15TE(F) | FET | |
| Q303 | | | 2SA1955A-F | TRANSISTOR | |
| Q401 | | | RT1N141M-T111 | TRANSISTOR | |
| Q402 | | | 2SJ506-E(S) | FET | |
| Q403 | | | RT1N441M-T111 | TRANSISTOR | |
| Q404 | | | RT1N141M-T111 | TRANSISTOR | |
| Q405 | | | DTC363EU | DIGITAL TRANSISTOR | |
| TH1 | | | ERTJ0EV104H | THERMISTOR | |

## DISPLAY UNIT (X54-3580-20)

| | | | | | | |
|---|---|---|---|---|---|---|
| D503-505 | | | B30-2151-05 | LED (RED/GREEN) | | |
| C501 | | | CS77AA1A100M | CHIP TNTL | 10UF | 10WV |
| C502,503 | | | CS77AA1A1R5M | CHIP TNTL | 1.5UF | 10WV |
| C504,505 | | | CK73GB1C104K | CHIP C | 0.10UF | K |
| C506 | | | CC73GCH1H470J | CHIP C | 47PF | J |
| C507,508 | | | CK73GB1C104K | CHIP C | 0.10UF | K |
| C509 | | | CK73GB1H103K | CHIP C | 0.010UF | K |
| C510 | | | CS77AA1A100M | CHIP TNTL | 10UF | 10WV |
| C511,512 | | | CK73GB1E103K | CHIP C | 0.010UF | K |
| C513-518 | | | CC73GCH1H101J | CHIP C | 100PF | J |
| C519,520 | | | CK73GB1E103K | CHIP C | 0.010UF | K |
| C521 | | | CS77AA1A100M | CHIP TNTL | 10UF | 10WV |
| C522 | | | CK73GB1C104K | CHIP C | 0.10UF | K |
| C523 | | | CK73FB1E334K | CHIP C | 0.33UF | K |
| C524 | | | CS77AA1A100M | CHIP TNTL | 10UF | 10WV |
| C525 | | | CK73GB1C104K | CHIP C | 0.10UF | K |
| C526 | | | CK73FB1E334K | CHIP C | 0.33UF | K |
| C601 | | | CC73GCH1H101J | CHIP C | 100PF | J |
| C602 | | | CK73GB1H102K | CHIP C | 1000PF | K |
| C603 | | | CC73GCH1H101J | CHIP C | 100PF | J |
| C606 | | | CC73GCH1H101J | CHIP C | 100PF | J |
| C607 | | | CK73GB1C104K | CHIP C | 0.10UF | K |
| CN501 | | | E41-2743-05 | PIN ASSY | | |
| CN502 | | | E40-6102-05 | PIN ASSY | | |
| CN601 | | | E41-2751-05 | PIN ASSY | | |
| J601 | | | E58-0522-05 | MODULAR JACK | | |
| - | | | J31-0543-05 | COLLAR (LH-5-1.5) | | |

**Note 1: This part cannot be replaced. Therefore, this part is not supplied as a service part.**
**If a part reference number is listed in a shaded box, that part does not come with the PCB.**

# PARTS LIST

**DISPLAY UNIT (X54-3580-20)**
**TX-RX UNIT (X57-7940-10)**

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| CP501-504 | | | RK75GB1J471J | CHIP-COM 470 J 1/16W | |
| R502,503 | | | RK73GB2A000J | CHIP R 0.0 J 1/10W | |
| R505 | | | RK73GB2A683J | CHIP R 68K J 1/10W | |
| R506 | | | RK73GB2A103J | CHIP R 10K J 1/10W | |
| R507 | | | RK73GB2A682J | CHIP R 6.8K J 1/10W | |
| R508 | | | RK73GB2A102J | CHIP R 1.0K J 1/10W | |
| R509 | | | RK73GB2A103J | CHIP R 10K J 1/10W | |
| R510 | | | RK73GB2A224J | CHIP R 220K J 1/10W | |
| R511,512 | | | RK73GB2A103J | CHIP R 10K J 1/10W | |
| R513 | | | RK73GB2A104J | CHIP R 100K J 1/10W | |
| R514 | | | RK73GB2A154J | CHIP R 150K J 1/10W | |
| R516 | | | RK73PB2H102J | CHIP R 1.0K J 1/2W | |
| R517 | | | RK73PB2H821J | CHIP R 820 J 1/2W | |
| R518,519 | | | RK73PB2H102J | CHIP R 1.0K J 1/2W | |
| R520-526 | | | RK73PB2H821J | CHIP R 820 J 1/2W | |
| R529-540 | | | RK73GB2A102J | CHIP R 1.0K J 1/10W | |
| R541-544 | | | RK73GB2A103J | CHIP R 10K J 1/10W | |
| R601 | | | RK73GB2A681J | CHIP R 680 J 1/10W | |
| R604,605 | | | RK73GB2A102J | CHIP R 1.0K J 1/10W | |
| R606 | | | RK73GB2A473J | CHIP R 47K J 1/10W | |
| VR501 | | | R32-0689-05 | SEMI FIXED VARIABLE RESISTOR (10K) | |
| VR601 | | | R31-0630-05 | VARIABLE RESISTOR (10K) | |
| S501-506 | | | S70-0502-05 | TACT SWITCH | |
| S507 | | | S68-0410-05 | PUSH SWITCH | |
| D501,502 | | | HSM88AS-E | DIODE | |
| D506,507 | | | LA-501DD | LED | |
| D508-514 | | | DA204U | DIODE | |
| D601,602 | | | DA204U | DIODE | |
| D603 | | | MINISMDC020F | VARISTOR | |
| IC501 | | | NJM4558E-ZB | ANALOGUE IC | |
| IC502-505 | | | BU4094BCFV | MOS-IC | |
| IC506,507 | | | TA78L05FF | MOS-IC | |
| Q501 | | | 2SC4116(Y)F | TRANSISTOR | |
| Q502 | | | 2SA1586(Y,GR)F | TRANSISTOR | |
| Q503,504 | | | UPA672T-A | FET | |
| Q506 | | ✻ | RT1P141M-T111 | TRANSISTOR | |
| Q507 | | | UPA672T-A | FET | |
| Q508-511 | | ✻ | RT1P141M-T111 | TRANSISTOR | |
| Q512-514 | | | UPA672T-A | FET | |
| Q516-519 | | | UPA672T-A | FET | |
| Q521-524 | | | UPA672T-A | FET | |
| Q525 | | | 2SK1824-A | FET | |

## TX-RX UNIT (X57-7940-10)

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| C101,102 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C103 | | | CC73HCH1H100B | CHIP C 10PF B | |
| C104 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C105 | | | CC73HCH1H100B | CHIP C 10PF B | |
| C106,107 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C108 | | | CC73HCH1H100B | CHIP C 10PF B | |
| C109 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C110 | | ✻ | CS77CA1V2R2M | CHIP TNTL 2.2UF 35WV | |
| C112 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C113 | | | CC73HCH1H120G | CHIP C 12PF G | |
| C114 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C115 | | | CC73HCH1H100B | CHIP C 10PF B | |
| C116,117 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C118 | | | CC73HCH1H220G | CHIP C 22PF G | |
| C119 | | ✻ | CK73HB1E104K | CHIP C 0.10UF K | |
| C120 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C121 | | | CC73HCH1H070B | CHIP C 7.0PF B | |
| C122 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C123 | | ✻ | CK73HB1E104K | CHIP C 0.10UF K | |
| C124 | | | CC73HCH1H270J | CHIP C 27PF J | |
| C125 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C127 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C129 | | | CC73HCH1H080D | CHIP C 8.0PF D | |
| C130 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C131 | | ✻ | CK73HB1E104K | CHIP C 0.10UF K | |
| C134,135 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C136 | | | CC73HCH1H080B | CHIP C 8.0PF B | |
| C137 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C138 | | | CC73HCH1H100B | CHIP C 10PF B | |
| C139,140 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C141 | | | CC73HCH1H080B | CHIP C 8.0PF B | |
| C142 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C144 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C145 | | | CC73HCH1H100B | CHIP C 10PF B | |
| C146 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C147 | | | CC73HCH1H100B | CHIP C 10PF B | |
| C148,149 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C150 | | | CC73HCH1H100B | CHIP C 10PF B | |
| C151 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C152 | | | CC73HCH1H220G | CHIP C 22PF G | |
| C154 | | | CC73HCH1H330G | CHIP C 33PF G | |
| C156 | | | CC73HCH1H330G | CHIP C 33PF G | |
| C158 | | | CC73HCH1H220G | CHIP C 22PF G | |
| C160,161 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C176 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C200,201 | | ✻ | CS77CA1V2R2M | CHIP TNTL 2.2UF 35WV | |
| C202 | | | CC73HCH1H100D | CHIP C 10PF D | |
| C203 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C204 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C205 | | ✻ | CK73HB1E104K | CHIP C 0.10UF K | |
| C206 | | | CC73HCH1H330J | CHIP C 33PF J | |
| C207,208 | | | CS77BA1D100M | CHIP TNTL 10UF 20WV | |
| C209 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C210 | | | CE32CL1V100M | CHIP EL 10UF 35WV | |
| C211 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C212 | | ✻ | CK73HB1H103K | CHIP C 0.010UF K | |
| C219 | | | CC73HCH1H100D | CHIP C 10PF D | |
| C220-223 | | ✻ | CK73HB1H103K | CHIP C 0.010UF K | |
| C224 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C225 | | | CC73HCH1H120G | CHIP C 12PF G | |
| C226 | | | CC73HCH1H680J | CHIP C 68PF J | |
| C227 | | ✻ | CK73HB1E104K | CHIP C 0.10UF K | |
| C228 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C229 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C230 | | | CC73HCH1H680J | CHIP C 68PF J | |
| C231 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C233,234 | | | CC73HCH1H470J | CHIP C 47PF J | |
| C235,236 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C237 | | | CC73HCH1H080B | CHIP C 8.0PF B | |
| C239 | | | CC73HCH1H180J | CHIP C 18PF J | |
| C241 | | | CC73HCH1H270J | CHIP C 27PF J | |
| C243 | | | CC73HCH1H270J | CHIP C 27PF J | |
| C245 | | | CC73HCH1H150J | CHIP C 15PF J | |



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# PARTS LIST

TX-RX UNIT (X57-7940-10)

| Ref. No. | Address | New parts | Parts No. | Description | | | Destination |
|---|---|---|---|---|---|---|---|
| C246 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C247 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C300 | | | CC73HCH1H270J | CHIP C | 27PF | J | |
| C301 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C302-305 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C306 | | | CC73HCH1H020B | CHIP C | 2.0PF | B | |
| C318 | | | CC73HCH1H270G | CHIP C | 27PF | G | |
| C322 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C323 | | | CE32CL1E4R7M | CHIP EL | 4.7UF | 25WV | |
| C325 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C326 | | | CC73HCH1H330G | CHIP C | 33PF | G | |
| C329 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C331 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C332,333 | | | CC73HCH1H270J | CHIP C | 27PF | J | |
| C334 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C335 | | | CC73HCH1H820J | CHIP C | 82PF | J | |
| C336 | | | CC73HCH1H270J | CHIP C | 27PF | J | |
| C337,338 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C339 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C341 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C342 | | | CC73HCH1H180J | CHIP C | 18PF | J | |
| C343,344 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C345 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C346 | | | CC73HCH1H180J | CHIP C | 18PF | J | |
| C347 | | | CC73HCH1H150G | CHIP C | 15PF | G | |
| C349 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C350 | | | CK73HB1A104K | CHIP C | 0.10UF | K | |
| C356 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C400-403 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C404 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C405,406 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C407 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C408 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C410 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C411 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C412 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C413 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C414 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C415 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C416 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C417 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C418,419 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C421 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C422 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C423 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C424-430 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C437-440 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C500-503 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C504 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C505-507 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C508 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C509-512 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C514 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C515 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C517 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C518 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C519 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C520 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C521 | | | CC73HCH1H180J | CHIP C | 18PF | J | |
| C522 | | | CC73HCH1H101J | CHIP C | 100PF | J | |
| C523 | | | CC73HCH1H331J | CHIP C | 330PF | J | |
| C524 | | | CC73HCH1H180J | CHIP C | 18PF | J | |
| C525 | | | CC73HCH1H470J | CHIP C | 47PF | J | |
| C526 | | | CC73HCH1H471J | CHIP C | 470PF | J | |
| C528 | | | CC73HCH1H121J | CHIP C | 120PF | J | |
| C529 | | | CC73HCH1H221J | CHIP C | 220PF | J | |
| C530-533 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C534 | | | CC73HCH1H050C | CHIP C | 5.0PF | C | |
| C535 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C536,537 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C538 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C539 | | | CC73HCH1H820J | CHIP C | 82PF | J | |
| C540 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C541 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C542 | | | CK73FB1A106K | CHIP C | 10UF | K | |
| C543-545 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C546 | | | CC73HCH1H390J | CHIP C | 39PF | J | |
| C547,548 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C549 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C550 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C551 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C600,601 | | | CK73FB1A106K | CHIP C | 10UF | K | |
| C602-604 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C605 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C606,607 | | | CK73FB1A106K | CHIP C | 10UF | K | |
| C608 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C610-613 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C614 | | | CS77BA1D100M | CHIP TNTL | 10UF | 20WV | |
| C615 | | | CC73HCH1H181J | CHIP C | 180PF | J | |
| C616 | | | CC73HCH1H470J | CHIP C | 47PF | J | |
| C618 | | | CS77CB21A470M | CHIP TNTL | 47UF | 10WV | |
| C619 | | | CC73HCH1H331J | CHIP C | 330PF | J | |
| C620 | | | CC73HCH1H180J | CHIP C | 18PF | J | |
| C621 | | | CS77CB21A470M | CHIP TNTL | 47UF | 10WV | |
| C622 | | | CC73HCH1H221J | CHIP C | 220PF | J | |
| C623 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C624 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C625 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C626 | | | CS77BA1D100M | CHIP TNTL | 10UF | 20WV | |
| C627 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C628 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C629,630 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C631 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C632 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C633,634 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C635 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C636,637 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C638 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C639 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C641 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C642 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C643 | | | CS77BA1D100M | CHIP TNTL | 10UF | 20WV | |
| C644 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C645 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C647,648 | | ✻ | CS77CA1V2R2M | CHIP TNTL | 2.2UF | 35WV | |
| C649 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C650 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C651 | | | CC73HCH1H101J | CHIP C | 100PF | J | |
| C652 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C653,654 | | | CS77BA1D100M | CHIP TNTL | 10UF | 20WV | |



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# PARTS LIST

**TX-RX UNIT (X57-7940-10)**

| Ref. No. | Address | New parts | Parts No. | Description | | | Destination |
|---|---|---|---|---|---|---|---|
| C655 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C656 | | | CE32CL1V100M | CHIP EL | 10UF | 35WV | |
| C657 | | | CC73HCH1H330J | CHIP C | 33PF | J | |
| C658 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C660 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C661 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C662 | | | CC73HCH1H390G | CHIP C | 39PF | G | |
| C663 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C664 | | | CC73HCH1H390G | CHIP C | 39PF | G | |
| C667 | | | CC73HCH1H030B | CHIP C | 3.0PF | B | |
| C671 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C672,673 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C674 | | | CC73HCH1H220J | CHIP C | 22PF | J | |
| C679,680 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C683-688 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C700 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C701 | | | C92-0905-05 | OS-CON | 47UF | 35WV | |
| C702 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C703 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C704 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C705 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C706 | | | C92-0765-05 | CHIP TNTL | 4.7UF | 16WV | |
| C707 | | | CE32CL1V100M | CHIP EL | 10UF | 35WV | |
| C708 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C709 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C710,711 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C712 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C713 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C714 | | | CC73HCH1H181J | CHIP C | 180PF | J | |
| C715 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C716 | | | CE32CL1V100M | CHIP EL | 10UF | 35WV | |
| C717 | | | CC73HCH1H220J | CHIP C | 22PF | J | |
| C718 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C719 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C720 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C721 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C722,723 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C724,725 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C726 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C727 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C728,729 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C814 | | | CC73HCH1H101J | CHIP C | 100PF | J | |
| C815 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C817,818 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C819 | | ✻ | CK73HB1H103K | CHIP C | 0.010UF | K | |
| C820 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C821 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C822 | | | CC73HCH1H100D | CHIP C | 10PF | D | |
| C823 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C825 | | | C93-0912-05 | CHIP C | 100UF | M | |
| C826 | | | CK73GB1E105K | CHIP C | 1.0UF | K | |
| C827 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C828 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C831 | | ✻ | CK73HB1E104K | CHIP C | 0.10UF | K | |
| C832 | | | CC73HCH1H050B | CHIP C | 5.0PF | B | |
| CN101 | | | E04-0154-05 | PIN SOCKET | | | |
| CN102 | | | E23-1330-05 | TERMINAL | | | |
| CN106 | | | E23-1330-05 | TERMINAL | | | |
| CN500 | | | E04-0154-05 | PIN SOCKET | | | |
| CN610 | | | E04-0154-05 | PIN SOCKET | | | |

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| CN700,701 | | | E41-2672-05 | PIN ASSY | |
| CN800 | | | E40-6656-05 | PIN ASSY | |
| CN801 | | | E41-2743-05 | PIN ASSY | |
| CN802 | | | E04-0193-05 | PIN SOCKET | |
| CN807-809 | | | E23-1278-05 | TERMINAL | |
| CN811-813 | | | E23-1278-05 | TERMINAL | |
| F700 | | | F53-0328-15 | FUSE (5A) | |
| CF400,401 | | | L72-1028-05 | CERAMIC FILTER | |
| CF402 | | | L72-1027-05 | CERAMIC FILTER | |
| CF403 | | | L72-1041-05 | CERAMIC FILTER | |
| L100,101 | | | L34-4567-05 | AIR-CORE COIL | |
| L102 | | | L41-2785-14 | SMALL FIXED INDUCTOR (270NH) | |
| L103,104 | | | L34-4567-05 | AIR-CORE COIL | |
| L105 | | | L41-2775-33 | SMALL FIXED INDUCTOR (0.027UH) | |
| L106 | | | L92-0467-05 | CHIP FERRITE | |
| L107 | | | L41-6878-14 | SMALL FIXED INDUCTOR (68NH) | |
| L108 | | | L41-2775-33 | SMALL FIXED INDUCTOR (0.027UH) | |
| L109 | | | L41-2278-14 | SMALL FIXED INDUCTOR (22NH) | |
| L111,112 | | | L34-4567-05 | AIR-CORE COIL | |
| L113 | | | L41-2785-14 | SMALL FIXED INDUCTOR (270NH) | |
| L114,115 | | | L34-4567-05 | AIR-CORE COIL | |
| L116-118 | | ✻ | L34-4932-05 | AIR-CORE COIL | |
| L119 | | | L34-4615-05 | AIR-CORE COIL | |
| L203 | | ✻ | L41-5685-47 | SMALL FIXED INDUCTOR (560NH) | |
| L205 | | | L41-4778-14 | SMALL FIXED INDUCTOR (47NH) | |
| L206 | | | L40-1085-92 | SMALL FIXED INDUCTOR (100NH) | |
| L207 | | | L41-5678-14 | SMALL FIXED INDUCTOR (56NH) | |
| L208-210 | | | L41-3375-33 | SMALL FIXED INDUCTOR (0.033UH) | |
| L211 | | | L41-1578-14 | SMALL FIXED INDUCTOR (15NH) | |
| L212,213 | | | L92-0467-05 | CHIP FERRITE | |
| L300 | | | L92-0467-05 | CHIP FERRITE | |
| L301 | | | L40-3381-86 | SMALL FIXED INDUCTOR (330NH) | |
| L302 | | ✻ | L41-5685-47 | SMALL FIXED INDUCTOR (560NH) | |
| L303 | | ✻ | L41-3385-47 | SMALL FIXED INDUCTOR (330NH) | |
| L306 | | | L40-3385-47 | SMALL FIXED INDUCTOR (330NH) | |
| L308 | | | L41-2263-14 | SMALL FIXED INDUCTOR (2.2NH) | |
| L309 | | | L41-1085-14 | SMALL FIXED INDUCTOR (100NH) | |
| L310 | | | L40-3385-47 | SMALL FIXED INDUCTOR (330NH) | |
| L312 | | | L41-3978-14 | SMALL FIXED INDUCTOR (39NH) | |
| L313 | | | L40-8275-92 | SMALL FIXED INDUCTOR (82NH) | |
| L315 | | | L41-3978-14 | SMALL FIXED INDUCTOR (39NH) | |
| L316 | | | L40-2785-92 | SMALL FIXED INDUCTOR (270NH) | |
| L317 | | | L41-1095-33 | SMALL FIXED INDUCTOR (1.0UH) | |
| L320 | | | L40-1885-92 | SMALL FIXED INDUCTOR (180NH) | |
| L500 | | | L41-3395-33 | SMALL FIXED INDUCTOR (3.3UH) | |
| L501 | | | L41-4795-33 | SMALL FIXED INDUCTOR (4.7UH) | |
| L502 | | | L41-6885-33 | SMALL FIXED INDUCTOR (0.68UH) | |
| L503 | | | L41-5685-33 | SMALL FIXED INDUCTOR (0.56UH) | |
| L504 | | | L41-2295-33 | SMALL FIXED INDUCTOR (2.2UH) | |
| L505,506 | | | L41-1295-33 | SMALL FIXED INDUCTOR (1.2UH) | |
| L507,508 | | | L41-3305-33 | SMALL FIXED INDUCTOR (33UH) | |
| L600,601 | | | L41-1005-33 | SMALL FIXED INDUCTOR (10UH) | |
| L602 | | | L92-0467-05 | CHIP FERRITE | |
| L603 | | | L41-1005-33 | SMALL FIXED INDUCTOR (10UH) | |
| L604 | | | L41-3385-33 | SMALL FIXED INDUCTOR (0.33UH) | |
| L605 | | | L41-3985-33 | SMALL FIXED INDUCTOR (0.39UH) | |
| L606 | | | L41-1095-33 | SMALL FIXED INDUCTOR (1.0UH) | |
| L607,608 | | | L41-4778-14 | SMALL FIXED INDUCTOR (47NH) | |



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# PARTS LIST

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| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| L609 | | | L41-1578-14 | SMALL FIXED INDUCTOR (15NH) | |
| L610 | | | L41-8278-14 | SMALL FIXED INDUCTOR (82NH) | |
| L613,614 | | | L92-0639-05 | CHIP FERRITE | |
| L615-617 | | | L92-0467-05 | CHIP FERRITE | |
| L618 | | | L41-1095-14 | SMALL FIXED INDUCTOR (1.0UH) | |
| L700 | | | L33-1462-05 | SMALL FIXED INDUCTOR (68UH) | |
| L701,702 | | | L41-1005-33 | SMALL FIXED INDUCTOR (10UH) | |
| L800,801 | | | L92-0467-05 | CHIP FERRITE | |
| L803 | | | L92-0162-05 | BEADS CORE | |
| L804 | | | L41-1285-14 | SMALL FIXED INDUCTOR (120NH) | |
| L805,806 | | | L92-0467-05 | CHIP FERRITE | |
| X500 | | | L77-3034-05 | TCXO (19.2MHZ) | |
| X600 | | * | L77-1960-15 | VCXO (16.8MHZ) | |
| XF300 | | | L71-0649-05 | MCF (58.05MHZ) | |
| R100 | | | RK73GB2A102J | CHIP R 1.0K J 1/10W | |
| R101 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R105,106 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R107 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R109,110 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R111 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R112 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R113 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R114 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R115 | | | RK73FB2B121J | CHIP R 120 J 1/8W | |
| R117 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R118 | | | RK73HB1J274J | CHIP R 270K J 1/16W | |
| R119 | | | RK73HB1J393J | CHIP R 39K J 1/16W | |
| R120 | | | RK73HB1J472J | CHIP R 4.7K J 1/16W | |
| R121 | | | RK73HB1J821J | CHIP R 820 J 1/16W | |
| R122 | | | RK73HB1J221J | CHIP R 220 J 1/16W | |
| R125 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R126 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R128,129 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R130 | | | RK73HB1J274J | CHIP R 270K J 1/16W | |
| R131 | | | RK73HB1J393J | CHIP R 39K J 1/16W | |
| R132-136 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R137 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R200 | | | RK73HB1J223J | CHIP R 22K J 1/16W | |
| R201,202 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R203 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R204 | | | RK73HB1J224J | CHIP R 220K J 1/16W | |
| R205 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R206 | | | RK73HB1J334J | CHIP R 330K J 1/16W | |
| R207 | | | RK73HB1J393J | CHIP R 39K J 1/16W | |
| R208 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R209 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R210 | | | RK73HB1J124J | CHIP R 120K J 1/16W | |
| R211 | | | RK73HB1J333J | CHIP R 33K J 1/16W | |
| R212 | | | RK73HB1J394J | CHIP R 390K J 1/16W | |
| R213 | | | RK73HB1J106J | CHIP R 10M J 1/16W | |
| R214 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R215,216 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R217 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R220 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R223 | | | RK73HB1J181J | CHIP R 180 J 1/16W | |
| R224 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R225 | | | RK73HB1J334J | CHIP R 330K J 1/16W | |
| R227 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R228,229 | | | RK73HB1J180J | CHIP R 18 J 1/16W | |

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| R231 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R232 | | | RK73HB1J271J | CHIP R 270 J 1/16W | |
| R233 | | | RK73HB1J472J | CHIP R 4.7K J 1/16W | |
| R234 | | | RK73HB1J182J | CHIP R 1.8K J 1/16W | |
| R235 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R236 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R237 | | | RK73HB1J680J | CHIP R 68 J 1/16W | |
| R238 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R243 | | | RK73HB1J271J | CHIP R 270 J 1/16W | |
| R244 | | | RK73HB1J180J | CHIP R 18 J 1/16W | |
| R245 | | | RK73HB1J271J | CHIP R 270 J 1/16W | |
| R247-249 | | | RK73GB2A180J | CHIP R 18 J 1/10W | |
| R250 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R251 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R300 | | | RK73HB1J331J | CHIP R 330 J 1/16W | |
| R301 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R302 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R303 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R304 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R305 | | | RK73HB1J123J | CHIP R 12K J 1/16W | |
| R306 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R310 | | | RK73HB1J122J | CHIP R 1.2K J 1/16W | |
| R311 | | | RK73GB2A100J | CHIP R 10 J 1/10W | |
| R312 | | | RK73HB1J100J | CHIP R 10 J 1/16W | |
| R313 | | | RK73HB1J272J | CHIP R 2.7K J 1/16W | |
| R314 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R315 | | | RK73GB2A101J | CHIP R 100 J 1/10W | |
| R316 | | | RK73GB2A100J | CHIP R 10 J 1/10W | |
| R318 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R320 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R323 | | | RK73HB1J151J | CHIP R 150 J 1/16W | |
| R332 | | | RK73HB1J470J | CHIP R 47 J 1/16W | |
| R400 | | | RK73HB1J224J | CHIP R 220K J 1/16W | |
| R401 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R402 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R403 | | | RK73HB1J682J | CHIP R 6.8K J 1/16W | |
| R404 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R405 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R406 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R407 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R408 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R409-411 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R412 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R413 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R415 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R416 | | | RK73HB1J222J | CHIP R 2.2K J 1/16W | |
| R417,418 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R420 | | | RK73HB1J470J | CHIP R 47 J 1/16W | |
| R421 | | | RK73HB1J182J | CHIP R 1.8K J 1/16W | |
| R422 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R425 | | | RK73HB1J183J | CHIP R 18K J 1/16W | |
| R426 | | | RK73HB1J822J | CHIP R 8.2K J 1/16W | |
| R427,428 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R429 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R431 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R433-435 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R436-438 | | | RK73HB1J152J | CHIP R 1.5K J 1/16W | |
| R442 | | | RK73HB1J821J | CHIP R 820 J 1/16W | |
| R443 | | | RK73HB1J821J | CHIP R 820 J 1/16W | |
| R444 | | | RK73HB1J122J | CHIP R 1.2K J 1/16W | |



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# PARTS LIST

**TX-RX UNIT (X57-7940-10)**

| Ref. No. | Address | New parts | Parts No. | Description | | | | Destination |
|---|---|---|---|---|---|---|---|---|
| R447 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R448,449 | | | RK73HB1J334J | CHIP R | 330K | J | 1/16W | |
| R450 | | | RK73HB1J563J | CHIP R | 56K | J | 1/16W | |
| R451 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R452 | | | RK73HB1J224J | CHIP R | 220K | J | 1/16W | |
| R453 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R500 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R501,502 | | | RK73HH1J104D | CHIP R | 100K | D | 1/16W | |
| R503 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R504 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R505 | | | RK73HB1J124J | CHIP R | 120K | J | 1/16W | |
| R506 | | | RK73HB1J471J | CHIP R | 470 | J | 1/16W | |
| R507 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R509 | | | RK73HB1J183J | CHIP R | 18K | J | 1/16W | |
| R510 | | | RK73HB1J223J | CHIP R | 22K | J | 1/16W | |
| R511 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R512 | | | RK73HB1J223J | CHIP R | 22K | J | 1/16W | |
| R513 | | | RK73HB1J471J | CHIP R | 470 | J | 1/16W | |
| R514 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R515 | | | RK73HB1J272J | CHIP R | 2.7K | J | 1/16W | |
| R516 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R518 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R519 | | | RK73HB1J181J | CHIP R | 180 | J | 1/16W | |
| R520 | | | RK73HB1J394J | CHIP R | 390K | J | 1/16W | |
| R521 | | | RK73HB1J154J | CHIP R | 150K | J | 1/16W | |
| R522 | | | RK73HB1J333J | CHIP R | 33K | J | 1/16W | |
| R523 | | | RK73HB1J151J | CHIP R | 150 | J | 1/16W | |
| R524 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R525 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R527 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R528 | | | RK73HB1J224J | CHIP R | 220K | J | 1/16W | |
| R529 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R530 | | | RK73HB1J471J | CHIP R | 470 | J | 1/16W | |
| R531,532 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R533 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R534 | | | RK73HB1J682J | CHIP R | 6.8K | J | 1/16W | |
| R535 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R536 | | | RK73HB1J272J | CHIP R | 2.7K | J | 1/16W | |
| R537 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R538 | | | RK73HB1J221J | CHIP R | 220 | J | 1/16W | |
| R539,540 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R541 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R542 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R543 | | | RK73HB1J221J | CHIP R | 220 | J | 1/16W | |
| R544 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R545,546 | | | RK73HB1J120J | CHIP R | 12 | J | 1/16W | |
| R547-550 | | | RK73HB1J182J | CHIP R | 1.8K | J | 1/16W | |
| R551 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R552 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R602 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R604 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R605 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R606-608 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R609 | | | RK73HB1J472J | CHIP R | 4.7K | J | 1/16W | |
| R610 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R611 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R612 | | | RK73HB1J470J | CHIP R | 47 | J | 1/16W | |
| R613 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R614 | | | RK73HB1J223J | CHIP R | 22K | J | 1/16W | |
| R615 | | | RK73HB1J273J | CHIP R | 27K | J | 1/16W | |

| Ref. No. | Address | New parts | Parts No. | Description | | | | Destination |
|---|---|---|---|---|---|---|---|---|
| R616 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R617 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R618 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R619 | | | RK73HB1J221J | CHIP R | 220 | J | 1/16W | |
| R620 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R621 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R622 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R623 | | | RK73HB1J562J | CHIP R | 5.6K | J | 1/16W | |
| R624 | | | RK73HB1J224J | CHIP R | 220K | J | 1/16W | |
| R625 | | | RK73HB1J221J | CHIP R | 220 | J | 1/16W | |
| R626 | | | RK73HB1J100J | CHIP R | 10 | J | 1/16W | |
| R627 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R628 | | | RK73HB1J471J | CHIP R | 470 | J | 1/16W | |
| R629,630 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R631 | | | RK73HB1J822J | CHIP R | 8.2K | J | 1/16W | |
| R632 | | | RK73HB1J182J | CHIP R | 1.8K | J | 1/16W | |
| R633 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R634 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R635 | | | RK73GB2A2R2J | CHIP R | 2.2 | J | 1/10W | |
| R636 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R637 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R638 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R639 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R640 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R641 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R642,643 | | | RK73HB1J104J | CHIP R | 100K | J | 1/16W | |
| R644 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R645 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R646 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R647 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R648 | | | RK73HB1J274J | CHIP R | 270K | J | 1/16W | |
| R649 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R650-652 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R653 | | | RK73HB1J124J | CHIP R | 120K | J | 1/16W | |
| R654 | | | RK73HB1J333J | CHIP R | 33K | J | 1/16W | |
| R655 | | | RK73HB1J394J | CHIP R | 390K | J | 1/16W | |
| R656 | | | RK73HB1J106J | CHIP R | 10M | J | 1/16W | |
| R657 | | | RK73HB1J223J | CHIP R | 22K | J | 1/16W | |
| R658 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R659 | | | RK73HB1J224J | CHIP R | 220K | J | 1/16W | |
| R660 | | | RK73HB1J334J | CHIP R | 330K | J | 1/16W | |
| R661 | | | RK73HB1J393J | CHIP R | 39K | J | 1/16W | |
| R663 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R665 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R666 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R668 | | | RK73HB1J472J | CHIP R | 4.7K | J | 1/16W | |
| R669 | | | RK73HB1J182J | CHIP R | 1.8K | J | 1/16W | |
| R670 | | | RK73HB1J271J | CHIP R | 270 | J | 1/16W | |
| R671 | | | RK73HB1J220J | CHIP R | 22 | J | 1/16W | |
| R672 | | | RK73HB1J180J | CHIP R | 18 | J | 1/16W | |
| R680 | | | RK73HB1J821J | CHIP R | 820 | J | 1/16W | |
| R681 | | | RK73HB1J5R6J | CHIP R | 5.6 | J | 1/16W | |
| R682 | | | RK73HB1J821J | CHIP R | 820 | J | 1/16W | |
| R683-685 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R686,687 | | | RK73HB1J472J | CHIP R | 4.7K | J | 1/16W | |
| R689,690 | | | RK73HB1J271J | CHIP R | 270 | J | 1/16W | |
| R700 | | | RK73HB1J330J | CHIP R | 33 | J | 1/16W | |
| R701 | | | RK73HB1J100J | CHIP R | 10 | J | 1/16W | |
| R702 | | | RK73HB1J473J | CHIP R | 47K | J | 1/16W | |
| R703 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |



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# PARTS LIST

**TX-RX UNIT (X57-7940-10)**
**RX VCO/PLL UNIT (X58-5070-10)**

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| R704 | | | RK73HB1J472J | CHIP R 4.7K J 1/16W | |
| R705 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R706 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R707 | | | RK73HB1J154J | CHIP R 150K J 1/16W | |
| R708,709 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R710 | | | RK73HB1J472J | CHIP R 4.7K J 1/16W | |
| R711 | | | RK73HB1J123J | CHIP R 12K J 1/16W | |
| R712 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R713 | | | RK73HH1J334D | CHIP R 330K D 1/16W | |
| R714 | | | RK73HH1J223D | CHIP R 22K D 1/16W | |
| R715-717 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R800-803 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R806-815 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R816,817 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R818 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R819 | | | RK73HB1J683J | CHIP R 68K J 1/16W | |
| R820 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R821 | | | RK73HB1J394J | CHIP R 390K J 1/16W | |
| R822 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R824,825 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R826 | | | RK73HB1J562J | CHIP R 5.6K J 1/16W | |
| R827 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R828 | | | RK73HB1J224J | CHIP R 220K J 1/16W | |
| R829 | | | RK73HB1J220J | CHIP R 22 J 1/16W | |
| R830 | | | RK73HB1J334J | CHIP R 330K J 1/16W | |
| R831 | | | RK73HB1J563J | CHIP R 56K J 1/16W | |
| R832 | | | RK73HB1J683J | CHIP R 68K J 1/16W | |
| R833-835 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R837 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R838 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R840,841 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R842-849 | | | RK73HB1J104J | CHIP R 100K J 1/16W | |
| R850,851 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R853 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R855 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R856 | | | RK73GB2A220J | CHIP R 22 J 1/10W | |
| R860,861 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| D100,101 | | | 1SV283F | VARIABLE CAPACITANCE DIODE | |
| D103-108 | | | 1SV283F | VARIABLE CAPACITANCE DIODE | |
| D200 | | | DA221 | DIODE | |
| D500,501 | | | UDZS3.0B | ZENER DIODE | |
| D503 | | | HSM88AS-E | DIODE | |
| D504,505 | | ✻ | JDP4P02AT | DIODE | |
| D600 | | | DA221 | DIODE | |
| D601 | | | HVC131 | DIODE | |
| D801 | | | 1SS388F | DIODE | |
| IC100,101 | | | LMC7101BIM5 | MOS-IC | |
| IC200 | | | TC75W51FK(F) | MOS-IC | |
| IC201 | | | LMC7101BIM5 | MOS-IC | |
| IC203 | | | TC7SH126FU-F | MOS-IC | |
| IC300 | | ✻ | ADL5350ACPZ | MOS-IC | |
| IC400 | | | AD8051ART | ANALOGUE IC | |
| IC401 | | | TC75W51FK(F) | MOS-IC | |
| IC402 | | | LMC7101BIM5 | MOS-IC | |
| IC403 | | ✻ | NJM2287V | MOS-IC | |
| IC404 | | | MCP6021-E/OT | MOS-IC | |
| IC405-408 | | | TC7W53FK(F) | MOS-IC | |
| IC409 | | | TC75W51FK(F) | MOS-IC | |
| IC500 | | | TC75W51FK(F) | MOS-IC | |

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| IC501 | | | TC75S59F-F | MOS-IC | |
| IC600,601 | | | TC7WH126FU-F | MOS-IC | |
| IC602 | | | ADF4001BRUZ | MOS-IC | |
| IC603 | | | TC75S51FE(F) | MOS-IC | |
| IC604 | | | LMC7101BIM5 | MOS-IC | |
| IC605 | | | TC75S51FE(F) | MOS-IC | |
| IC606,607 | | | LMC7101BIM5 | MOS-IC | |
| IC608 | | | TC75W51FK(F) | MOS-IC | |
| IC700 | | | NJM78M05DL1AZB | ANALOGUE IC | |
| IC701 | | | XC9101D09AKR | ANALOGUE IC | |
| IC702 | | | NJM78M08FA-ZB | ANALOGUE IC | |
| IC703 | | | TK71733S | BI-POLAR IC | |
| IC704 | | | TK11230CMCL-G | BI-POLAR IC | |
| IC800 | | | LM73CIMKX-0 | MOS-IC | |
| IC801 | | | TC75S51FE(F) | MOS-IC | |
| IC802 | | ✻ | M24C02-RMN6TP | ROM IC | |
| IC803 | | | TC75W51FK(F) | MOS-IC | |
| IC804 | | | M62364FP-F | MOS-IC | |
| IC805 | | ✻ | MCP23S08TE/ML | MOS-IC | |
| IC806 | | | TC7W53FK(F) | MOS-IC | |
| Q100 | | | 2SC5383-T111 | TRANSISTOR | |
| Q101 | | | 2SC5337 | TRANSISTOR | |
| Q200,201 | | | 2SC5383-T111 | TRANSISTOR | |
| Q202,203 | | | 2SC5636 | TRANSISTOR | |
| Q300 | | | 3SK294-FP | FET | |
| Q301 | | | 2SC5337 | TRANSISTOR | |
| Q500 | | | SSM6L05FU-F | FET | |
| Q501 | | | 2SC4617(R) | TRANSISTOR | |
| Q502 | | ✻ | 2SK3737-5 | FET | |
| Q503 | | | 3SK294-FP | FET | |
| Q504 | | | 2SC4617(R) | TRANSISTOR | |
| Q505 | | | SSM3K15TE(F) | FET | |
| Q506 | | | SSM6L05FU-F | FET | |
| Q507 | | | UPA672T-A | FET | |
| Q600 | | | SSM3K15TE(F) | FET | |
| Q601 | | | 2SA1832(GR)F | TRANSISTOR | |
| Q602,603 | | | 2SC4617(R) | TRANSISTOR | |
| Q604,605 | | | 2SC5383-T111 | TRANSISTOR | |
| Q606 | | | 2SC5636 | TRANSISTOR | |
| Q607 | | | SSM3K15TE(F) | FET | |
| Q700 | | | CPH3317 | FET | |
| Q701 | | | SSM3K15TE(F) | FET | |
| Q702 | | | 2SJ506-E(S) | FET | |
| Q703 | | | RT1N141M-T111 | TRANSISTOR | |
| Q704 | | | SSM5H01TU-F | FET | |
| Q705 | | | CPH3317 | FET | |
| Q706 | | | SSM3K15TE(F) | FET | |
| Q800 | | | SSM3K15TE(F) | FET | |

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

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| C300 | | | C92-0863-05 | CHIP TNTL | 0.047UF | 35WV | |
| C303 | | | CS77BA1D100M | CHIP TNTL | 10UF | 20WV | |
| C304 | | | CC73GCH1H100C | CHIP C | 10PF | C | |
| C306 | | | CC73GCH1H100C | CHIP C | 10PF | C | |
| C307 | | | CS77CA1V0R1M | CHIP TNTL | 0.1UF | 35WV | |
| C308-310 | | | CK73HB1E103K | CHIP C | 0.010UF | K | |
| C311 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C312 | | | CC73GCH1H180J | CHIP C | 18PF | J | |



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# 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 |
|---|---|---|---|---|---|---|---|---|
| C313 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |
| C314 | | | CS77BA1E010M | CHIP TNTL | 1.0UF | 25WV | | |
| C315,316 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |
| C317 | | | CK73HB1E103K | CHIP C | 0.010UF | K | | |
| C318 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |
| C320-322 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |
| C323 | | | CC73GCH1H030B | CHIP C | 3.0PF | B | | |
| C324 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |
| C326 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |
| C328 | | | CC73GCH1H180J | CHIP C | 18PF | J | | |
| C329 | | | CK73HB1H102K | CHIP C | 1000PF | K | | |
| C330 | | | CC73HCH1H040B | CHIP C | 4.0PF | B | | |
| C331 | | | CK73HB1H102K | CHIP C | 1000PF | K | | |
| C332 | | | CC73HCH1H100C | CHIP C | 10PF | C | | |
| C333 | | | CK73HB1E103K | CHIP C | 0.010UF | K | | |
| C335 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |
| C352,353 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |
| C354,355 | | | CK73GB1H102K | CHIP C | 1000PF | K | | |
| C356,357 | | | CK73HB1H102K | CHIP C | 1000PF | K | | |
| C358,359 | | | CK73HB1E103K | CHIP C | 0.010UF | K | | |
| C360,361 | | | CK73HB1H102K | CHIP C | 1000PF | K | | |
| C362 | | | CC73GCH1H330G | CHIP C | 33PF | G | | |
| C363 | | | CC73GCH1H220G | CHIP C | 22PF | G | | |
| C364 | | | CC73GCH1H070B | CHIP C | 7.0PF | B | | |
| C365 | | | CC73GCH1H050B | CHIP C | 5.0PF | B | | |
| C366,367 | | | CK73HB1H102K | CHIP C | 1000PF | K | | |
| C368 | | | CC73GCH1H150G | CHIP C | 15PF | G | | |
| C369 | | | CC73GCH1H120G | CHIP C | 12PF | G | | |
| C370-373 | | | CC73GCH1H080B | CHIP C | 8.0PF | B | | |
| C374,375 | | | CC73GCH1H010B | CHIP C | 1.0PF | B | | |
| C376,377 | | | CK73HB1H102K | CHIP C | 1000PF | K | | |
| C378 | | | CC73HCH1H100C | CHIP C | 10PF | C | | |
| C379 | | | C93-0787-05 | CHIP C | 0.1UF | J | | |
| C380,381 | | | CC73GCH1H030B | CHIP C | 3.0PF | B | | |
| CN303 | | | E40-5816-05 | PIN ASSY | | | | |
| CN350 | | ✻ | E40-6860-05 | PIN ASSY | | | | |
| CN351 | | | E40-6098-05 | PIN ASSY | | | | |
| - | | | F10-2377-04 | SHIELDING CASE | | | | |
| L300 | | | L92-0163-05 | BEADS CORE | | | | |
| L303 | | | L41-1295-33 | SMALL FIXED INDUCTOR (1.2UH) | | | | |
| L305,306 | | | L92-0163-05 | BEADS CORE | | | | |
| L307 | | | L41-6868-14 | SMALL FIXED INDUCTOR (6.8NH) | | | | |
| L309 | | | L41-3978-14 | SMALL FIXED INDUCTOR (39NH) | | | | |
| L310 | | | L92-0163-05 | BEADS CORE | | | | |
| L312,313 | | | L92-0163-05 | BEADS CORE | | | | |
| L314 | | | L41-6868-14 | SMALL FIXED INDUCTOR (6.8NH) | | | | |
| L315 | | | L41-2778-14 | SMALL FIXED INDUCTOR (27NH) | | | | |
| L350-357 | | | L41-1005-33 | SMALL FIXED INDUCTOR (10UH) | | | | |
| L358,359 | | | L34-4612-05 | AIR-CORE COIL | | | | |
| L360-363 | | | L41-1005-33 | SMALL FIXED INDUCTOR (10UH) | | | | |
| L364 | | | L41-8275-33 | SMALL FIXED INDUCTOR (0.082UH) | | | | |
| R301 | | | RK73GB2A391J | CHIP R | 390 | J | 1/10W | |
| R302 | | | RK73GB2A151J | CHIP R | 150 | J | 1/10W | |
| R303 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R304 | | | RK73HB1J472J | CHIP R | 4.7K | J | 1/16W | |
| R305 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R306 | | | RK73HB1J100J | CHIP R | 10 | J | 1/16W | |
| R307 | | | RK73HB1J470J | CHIP R | 47 | J | 1/16W | |
| R308 | | | RK73HB1J100J | CHIP R | 10 | J | 1/16W | |
| R310 | | | RK73HB1J102J | CHIP R | 1.0K | J | 1/16W | |
| R311 | | | RK73HB1J100J | CHIP R | 10 | J | 1/16W | |
| R312 | | | RK73HB1J330J | CHIP R | 33 | J | 1/16W | |
| R313 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R314 | | | RK73HB1J472J | CHIP R | 4.7K | J | 1/16W | |
| R315 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R316 | | | RK73HB1J100J | CHIP R | 10 | J | 1/16W | |
| R317 | | | RK73HB1J101J | CHIP R | 100 | J | 1/16W | |
| R319 | | | RK73HB1J331J | CHIP R | 330 | J | 1/16W | |
| R320 | | | RK73HB1J223J | CHIP R | 22K | J | 1/16W | |
| R321 | | | RK73HB1J103J | CHIP R | 10K | J | 1/16W | |
| R322 | | | RK73HB1J8R2J | CHIP R | 8.2 | J | 1/16W | |
| R323 | | | RK73HB1J151J | CHIP R | 150 | J | 1/16W | |
| R324 | | | RK73HB1J8R2J | CHIP R | 8.2 | J | 1/16W | |
| R325 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R327 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R331 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R333 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R350,351 | | | RK73HB1J474J | CHIP R | 470K | J | 1/16W | |
| R352 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R354 | | | RK73HB1J474J | CHIP R | 470K | J | 1/16W | |
| R357-360 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R361,362 | | ✻ | RN73GH1J330D | CHIP R | 33 | D | 1/16W | |
| R363,364 | | | RN73GH1J271D | CHIP R | 270 | D | 1/16W | |
| R365,366 | | | RN73GH1J470D | CHIP R | 47 | D | 1/16W | |
| R367 | | | RK73HB1J330J | CHIP R | 33 | J | 1/16W | |
| R368 | | | RN73GH1J473D | CHIP R | 47K | D | 1/16W | |
| R369 | | | RN73GH1J103D | CHIP R | 10K | D | 1/16W | |
| R370 | | | RK73HB1J221J | CHIP R | 220 | J | 1/16W | |
| R372 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| R374 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R377 | | | RK73GB2A000J | CHIP R | 0.0 | J | 1/10W | |
| R379 | | | RK73HB1J000J | CHIP R | 0.0 | J | 1/16W | |
| D352,353 | | | 1SV325F | 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 | | | | |

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

| Ref. No. | Address | New parts | Parts No. | Description | | | | Destination |
|---|---|---|---|---|---|---|---|---|
| C300 | | | C92-0863-05 | CHIP TNTL | 0.047UF | 35WV | | |
| C303 | | | CS77BA1D100M | CHIP TNTL | 10UF | 20WV | | |
| C304 | | | CC73GCH1H100C | CHIP C | 10PF | C | | |
| C306 | | | CC73GCH1H100C | CHIP C | 10PF | C | | |
| C307 | | | CS77CA1VR15M | CHIP TNTL | 0.15UF | 35WV | | |
| C308-310 | | | CK73HB1E103K | CHIP C | 0.010UF | K | | |
| C311 | | | CK73HB1H102K | CHIP C | 1000PF | K | | |
| C312 | | | CC73GCH1H330G | CHIP C | 33PF | G | | |
| C313 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |
| C314 | | | CS77BA1E010M | CHIP TNTL | 1.0UF | 25WV | | |
| C315,316 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |
| C317 | | | CK73HB1E103K | CHIP C | 0.010UF | K | | |
| C318 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |
| C320-322 | | | CC73HCH1H101J | CHIP C | 100PF | J | | |



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# PARTS LIST

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

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| C323 | | | CC73GCH1H030B | CHIP C 3.0PF B | |
| C324 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C326 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C328 | | | CC73GCH1H330G | CHIP C 33PF G | |
| C329 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C330 | | | CC73HCH1H050C | CHIP C 5.0PF C | |
| C331,332 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C333 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C335 | | | CC73HCH1H101J | CHIP C 100PF J | |
| C350 | | | C93-0787-05 | CHIP C 0.1UF J | |
| C354,355 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C356,357 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C358,359 | | | CK73HB1E103K | CHIP C 0.010UF K | |
| C360,361 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C362,363 | | | CC73GCH1H220G | CHIP C 22PF G | |
| C366,367 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C368 | | | CC73GCH1H020B | CHIP C 2.0PF B | |
| C369 | | | CC73GCH1H030B | CHIP C 3.0PF B | |
| C372,373 | | | CC73GCH1H150G | CHIP C 15PF G | |
| C374,375 | | | CC73GCH1H010B | CHIP C 1.0PF B | |
| C376,377 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C378 | | | CC73HCH1H120J | CHIP C 12PF J | |
| C379 | | | C93-0787-05 | CHIP C 0.1UF J | |
| C382 | | | CC73GCH1H050B | CHIP C 5.0PF B | |
| C384 | | | CC73GCH1H050B | CHIP C 5.0PF B | |
| CN303 | | | E40-5816-05 | PIN ASSY | |
| CN350 | | ✻ | E40-6860-05 | PIN ASSY | |
| CN351 | | | E40-6098-05 | PIN ASSY | |
| - | | | F10-2377-04 | SHIELDING CASE | |
| L300 | | | L92-0163-05 | BEADS CORE | |
| L303 | | | L41-1295-33 | SMALL FIXED INDUCTOR (1.2UH) | |
| L305,306 | | | L92-0163-05 | BEADS CORE | |
| L307 | | | L41-6868-14 | SMALL FIXED INDUCTOR (6.8NH) | |
| L309 | | | L41-6878-14 | SMALL FIXED INDUCTOR (68NH) | |
| L310 | | | L92-0163-05 | BEADS CORE | |
| L312,313 | | | L92-0163-05 | BEADS CORE | |
| L314 | | | L41-6868-14 | SMALL FIXED INDUCTOR (6.8NH) | |
| L315 | | | L41-4778-14 | SMALL FIXED INDUCTOR (47NH) | |
| 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) | |
| R301 | | | RK73GB2A391J | CHIP R 390 J 1/10W | |
| R302 | | | RK73GB2A151J | CHIP R 150 J 1/10W | |
| R303 | | | RK73GB2A000J | CHIP R 0.0 J 1/10W | |
| R304 | | | RK73HB1J472J | CHIP R 4.7K J 1/16W | |
| R305 | | | RK73GB2A000J | CHIP R 0.0 J 1/10W | |
| R306 | | | RK73HB1J100J | CHIP R 10 J 1/16W | |
| R307 | | | RK73HB1J560J | CHIP R 56 J 1/16W | |
| R308 | | | RK73HB1J100J | CHIP R 10 J 1/16W | |
| R310 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R311 | | | RK73HB1J100J | CHIP R 10 J 1/16W | |
| R312 | | | RK73HB1J470J | CHIP R 47 J 1/16W | |
| R313 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R315 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R316 | | | RK73HB1J100J | CHIP R 10 J 1/16W | |
| R317 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R318 | | | RK73HB1J222J | CHIP R 2.2K J 1/16W | |
| R319 | | | RK73HB1J331J | CHIP R 330 J 1/16W | |
| R320 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R321 | | | RK73HB1J562J | CHIP R 5.6K J 1/16W | |
| R322 | | | RK73HB1J8R2J | CHIP R 8.2 J 1/16W | |
| R323 | | | RK73HB1J151J | CHIP R 150 J 1/16W | |
| R324 | | | RK73HB1J8R2J | CHIP R 8.2 J 1/16W | |
| R325 | | | RK73GB2A000J | CHIP R 0.0 J 1/10W | |
| R327 | | | RK73GB2A000J | CHIP R 0.0 J 1/10W | |
| R331 | | | RK73GB2A000J | CHIP R 0.0 J 1/10W | |
| R333 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R350,351 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R353 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R354 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R355 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R356 | | | RK73HB1J330J | CHIP R 33 J 1/16W | |
| R357-360 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R361,362 | | ✻ | RN73GH1J330D | CHIP R 33 D 1/16W | |
| R363,364 | | | RN73GH1J331D | CHIP R 330 D 1/16W | |
| R365,366 | | | RN73GH1J470D | CHIP R 47 D 1/16W | |
| R367 | | | RK73HB1J330J | CHIP R 33 J 1/16W | |
| R368 | | | RN73GH1J473D | CHIP R 47K D 1/16W | |
| R369 | | | RN73GH1J103D | CHIP R 10K D 1/16W | |
| R370 | | | RK73HB1J221J | CHIP R 220 J 1/16W | |
| R371 | | | RK73HB1J681J | CHIP R 680 J 1/16W | |
| R372 | | | RK73HB1J000J | CHIP R 0.0 J 1/16W | |
| R373 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R374 | | | RK73GB2A000J | CHIP R 0.0 J 1/10W | |
| R377 | | | RK73GB2A000J | CHIP R 0.0 J 1/10W | |
| 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 | |



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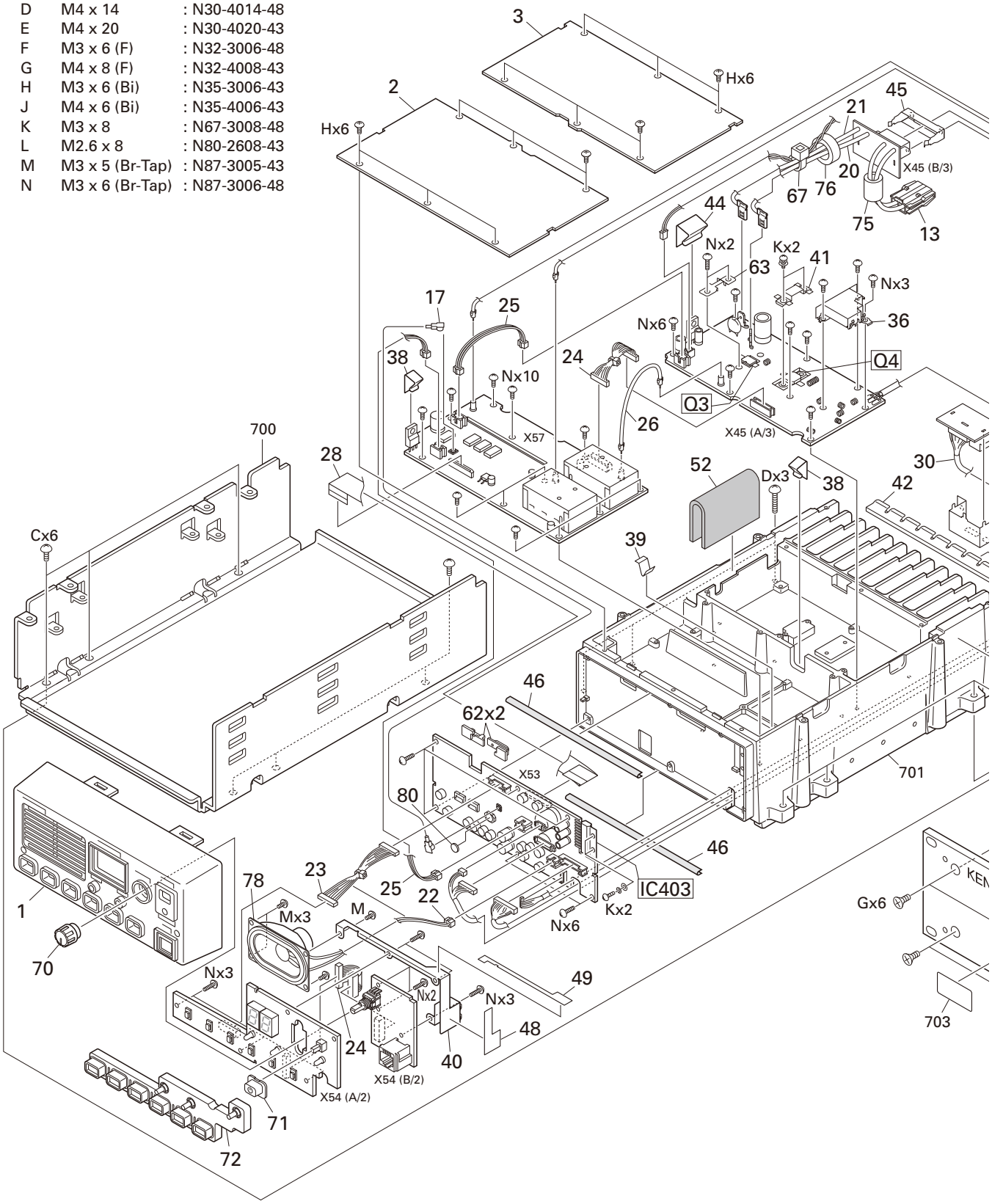
# EXPLODED VIEW

| | | |
|---|---|---|
| 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 |




**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.**



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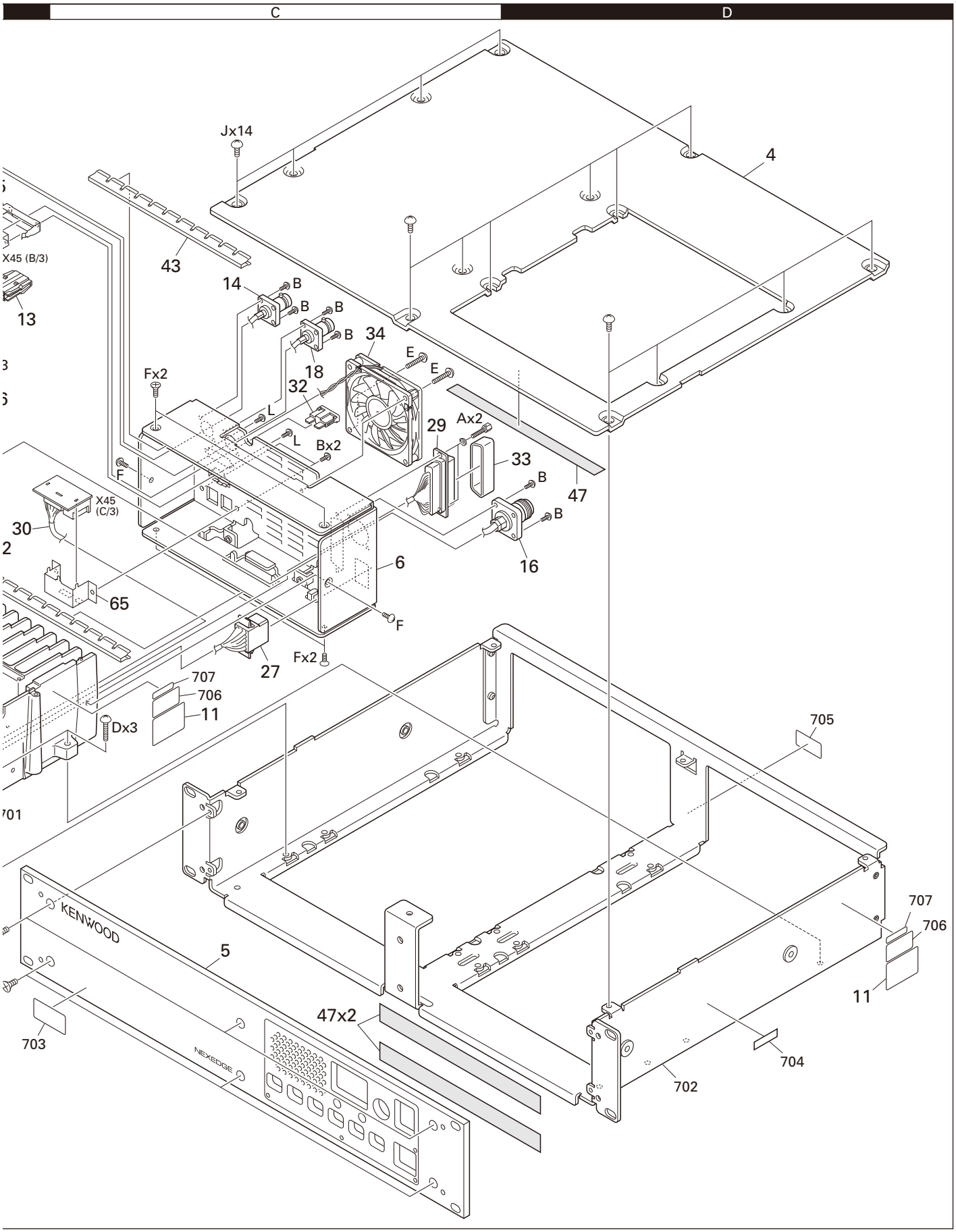
# EXPLODED VIEW




▲

**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.**



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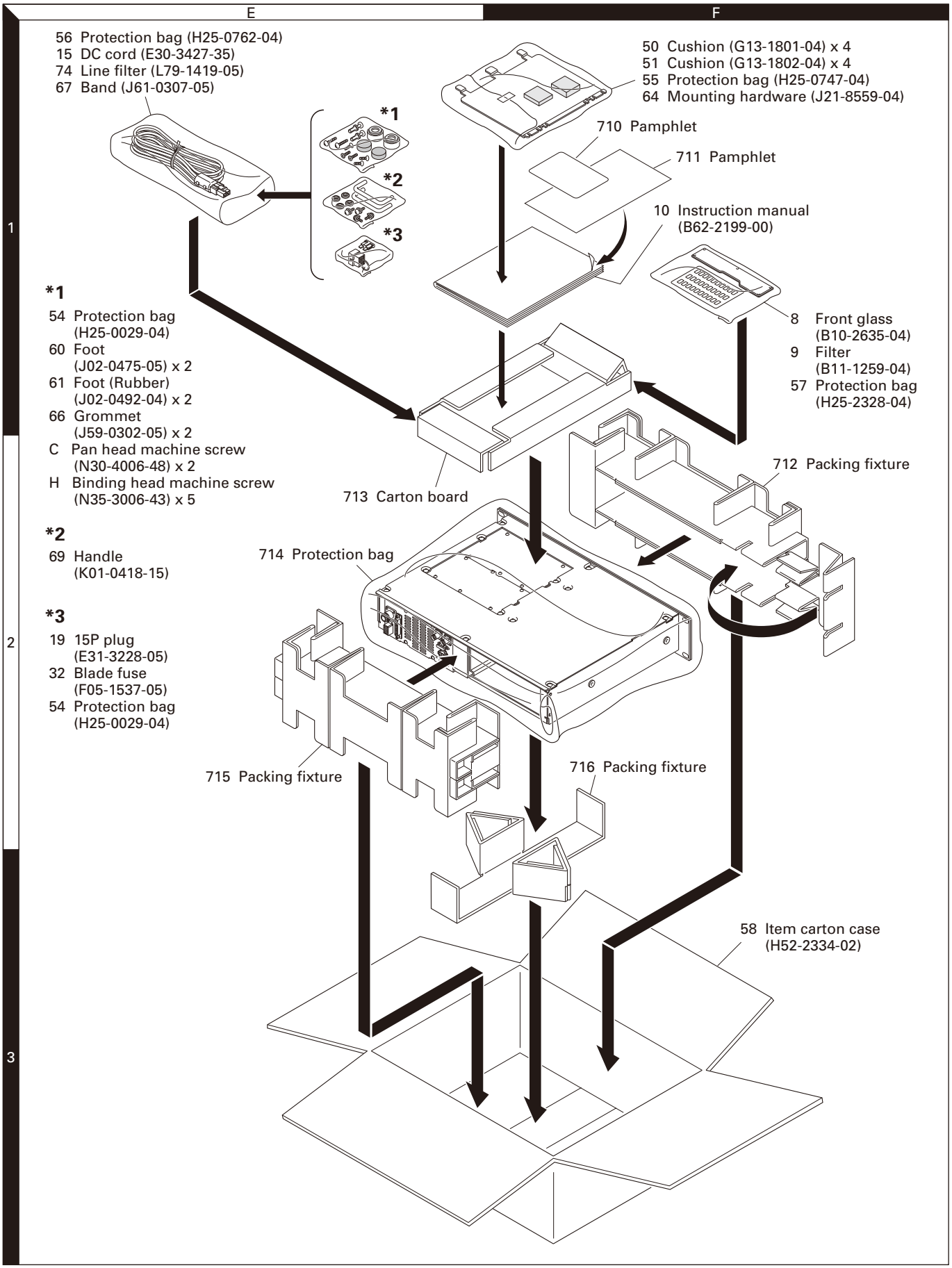
# PACKING




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



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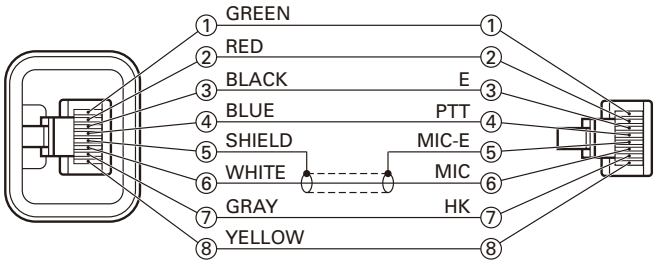
# ADJUSTMENT

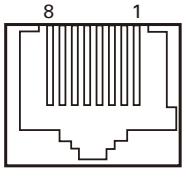
## Test Equipment Required for Alignment

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

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



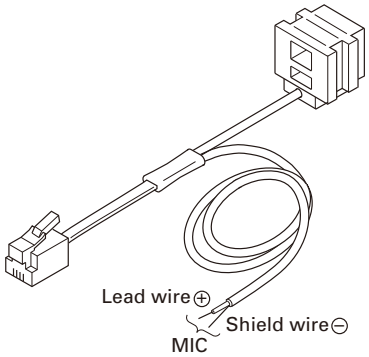

### MIC connector (Front panel view)




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

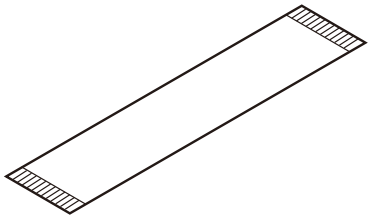
### Tuning cable (E30-3383-05)

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




### 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.





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# 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 | Blank | Blank |

## Test Signaling (Analog)

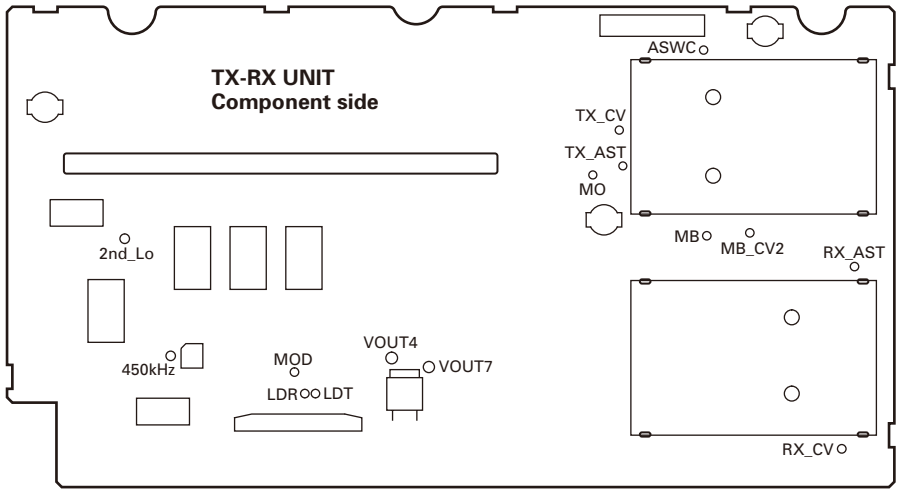
| No. | RX (Decode Signaling) | TX (Encode Signaling) |
|---|---|---|
| 1 | None | None |
| 2 | None | 100Hz Square Wave |
| 3 | QT 67.0Hz | QT 67.0Hz |
| 4 | QT 151.4Hz | QT 151.4Hz |
| 5 | QT 210.7Hz | QT 210.7Hz |
| 6 | QT 254.1Hz | QT 254.1Hz |
| 7 | DQT D023N | DQT D023N |
| 8 | DQT D754I | DQT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

## Measurement Terminal



# 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 (13.6V).<br>2) Turn the power switch on after connecting a PC and FPU cable to the radio.<br>3) Start up the program for the adjustment. | | | | | | | |
| 2. RX Assist voltage Adjust | FPU Test mode<br>1) Adjust Item: [Receive Assist]<br>2) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High] | | | | | PC ADJ | 3.0V | ±0.1V<br><br>[V] indicator on the PC window shows "VCO lock voltage".<br>Change the adjustment value to get "VCO lock voltage" within the limit of the specified voltage.<br><br>Press [Apply All] button to store the adjustment value.<br><br>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 | CV | | | Check | 3.0V±0.1V |
| 3. TX Assist voltage Adjust | FPU Test mode<br>1) Adjust Item: [Transmit Assist]<br>2) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High]<br>Press [Transmit] button. | | | | | PC ADJ | 3.0V | ±0.1V<br><br>[V] indicator on the PC window shows "VCO lock voltage".<br>Change the adjustment value to get "VCO lock voltage" within the limit of the specified voltage.<br><br>Press [Apply All] button to store the adjustment value.<br><br>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]<br>Press [Transmit] button. | DVM | TX-RX | CV | | | Check | 3.0V±0.1V |
| 4. Sensitivity 1 Adjust BPF Adjust | FPU Test mode<br>1) Adjust Item: [Sensitivity 1]<br>2) Adjust Item: [Low], [Low'], [Center], [High'], [High] | | | | | PC ADJ | Write the value as followings (typical value)<br>[Low] = 55<br>[Low'] = 70<br>[Center] = 85<br>[High'] = 110<br>[High] = 135 | Press [Apply All] button to store the adjustment value.<br><br>Variable-Capacitor Tune voltage is adjusted.<br>(Output voltage is adjustment of BPF) |



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# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications / Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 5. Sensitivity 2 Adjust BPF Adjust | FPU Test mode<br>1) Adjust Item: [Sensitivity 2]<br>2) Adjust Item: [Low], [Low'], [Center], [High'], [High] | | | | | PC ADJ | Write the value as followings (typical value)<br>[Low] = 65<br>[Low'] = 75<br>[Center] = 90<br>[High'] = 115<br>[High] = 145 | Press [Apply All] button to store the adjustment value.<br><br>Variable-Capacitor Tune voltage is adjusted.<br>(Output voltage is adjustment of BPF) |
| 6. AGC Target Level adjust | FPU Test mode<br>1) Adjust Item: [AGC Target Level Adjustment] | | | | | | Write the value as followings (typical value)<br>[AGC Target Level Adjustment] = –18 | Press [Apply] button to store the adjustment value. |
| 7. AGC adjustment [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [AGC Adjustment (Analog Narrow)]<br>2) Adjust Item: [Low], [Low'], [Center], [High'], [High] | | | | | | Write the value as followings (typical value)<br>[Low] = 256<br>[Low'] = 256<br>[Center] = 256<br>[High'] = 256<br>[High] = 256 | Press [Apply All] button to store the adjustment value. |
| 8. AGC adjustment [Analog Wide] | FPU Test mode<br>1) Adjust Item: [AGC Adjustment (Analog Wide)]<br>2) Adjust Item: [Low], [Low'], [Center], [High'], [High] | | | | | | | |
| 9. AGC adjustment [NXDN Very Narrow] | FPU Test mode<br>1) Adjust Item: [AGC Adjustment (NXDN Very Narrow)]<br>2) Adjust Item: [Low], [Low'], [Center], [High'], [High] | | | | | | | |
| 10. Frequency Adjust | FPU Test mode<br>1) Adjust Item: [Frequency]<br>Connect the SSG to the RX ANT.<br>CH: 1 (Analog Narrow)<br>SSG Output: –47dBm (without modulation)<br>**Caution:**<br>Perform the frequency adjustment under the following condition.<br>• Temperature range of +23°C to +27°C (+73.4°F to +80.6°F).<br>The temperature is displayed on the frequency adjustment screen of the [KPG-129D]<br>• Use an accuracy of 0.001ppm for the SSG.<br>Use a standard oscillator if necessary. | SSG | Rear | RX ANT | | PC ADJ | | Press [Start] button of [Auto Tuning].<br>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 Output level Adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [RD Level (Analog Wide)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: Desired Frequency<br>Output: –53dBm (501µV)<br>MOD: 1.0kHz<br>DEV: ±3.0kHz | SSG<br><br>AF VTVM | Rear | RX ANT<br><br>Control I/O Jack RD (Pin No.10) | | PC ADJ | 80mV | ±5mV<br><br>Press [Apply] button to store the adjustment value. |
| 2. RD Output level Adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [RD Level (Analog Narrow)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: Desired Frequency<br>Output: –53dBm (501µV)<br>MOD: 1.0kHz<br>DEV: ±1.5kHz | | | | | | | |
| 3. RA Output level Adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [RA Level (Analog Wide)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: Desired Frequency<br>Output: –53dBm (501µV)<br>MOD: 1.0kHz<br>DEV: ±3.0kHz | SSG<br><br>AF VTVM | Rear | RX ANT<br><br>Control I/O Jack RA (Pin No.11) | | PC ADJ | 400mV | ±20mV<br><br>Press [Apply] button to store the adjustment value. |
| 4. RA Output level Adjust [Analog Nrrow] | FPU Test mode<br>1) Adjust Item: [RA Level (Analog Narrow)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: Desired Frequency<br>Output: –53dBm (501µV)<br>MOD: 1.0kHz<br>DEV: ±1.5kHz | | | | | | | |
| 5. Open Squelch Adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [Open Squelch (Analog Wide)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'], [Center], [High'], [High]<br>Output<br>: 12dB SINAD level –1dB<br>MOD: 1.0kHz<br>DEV: ±3.0kHz | SSG<br>Audio analyzer<br>Oscilloscope | Rear | RX ANT | | PC ADJ | | Press [Apply] button to store the adjustment value. |
| | 2) SSG output: OFF | | | | | | Check | The squelch shall be closed. |



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# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications / Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 6. Open Squelch Adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [Open Squelch (Analog Narrow)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'], [Center], [High'], [High]<br>Output<br>: 12dB SINAD level –1dB<br>MOD: 1.0kHz<br>DEV: ±1.5kHz | SSG<br>Audio analyzer<br>Oscilloscope | Rear | RX ANT | | PC ADJ | | Press [Apply] button to store the adjustment value. |
| | 2) SSG output: OFF | | | | | | Check | The squelch shall be closed. |
| 7. Open Squelch Adjust [NXDN Very Narrow] | FPU Test mode<br>1) Adjust Item: [Open Squelch (NXDN Very Narrow)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'], [Center], [High'], [High]<br>Output: 12dB SINAD level of Analog Narrow –4dB<br>MOD: OFF | | | | | PC ADJ | | Press [Apply] button to store the adjustment value. |
| 8. Tight Squelch Adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [Tight Squelch (Analog Wide)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'], [Center], [High'], [High]<br>Output<br>: 12dB SINAD level +6dB<br>MOD: 1.0kHz<br>DEV: ±3.0kHz | | | | | PC ADJ | | Press [Apply] button to store the adjustment value. |
| | 2) SSG output: OFF | | | | | | Check | The squelch shall be closed. |
| 9. Tight Squelch Adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item [Tight Squelch (Analog Narrow)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'], [Center], [High'], [High]<br>Output<br>: 12dB SINAD level +8dB<br>MOD: 1.0kHz<br>DEV: ±1.5kHz | | | | | PC ADJ | | Press [Apply] button to store the adjustment value. |
| | 2) SSG output: OFF | | | | | | Check | The squelch shall be closed. |



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# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications / Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 10. RSSI Refarence Adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item [RSSI Ref (Analog Wide)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'] [Center], [High'], [High]<br>Output<br>: 12dB SINAD level –1dB<br>MOD: 1.0kHz<br>DEV: ±3.0kHz | SSG<br>Audio analyzer | Rear | RX ANT | | PC ADJ | | Press [Apply] button to store the adjustment value. |
| 11. RSSI Refarence Adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item [RSSI Ref (Analog Narrow)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'] [Center], [High'], [High]<br>Output<br>: 12dB SINAD level –1dB<br>MOD: 1.0kHz<br>DEV: ±1.5kHz | | | | | | | |
| 12. RSSI Refarence Adjust [NXDN Very Narrow] | FPU Test mode<br>1) Adjust Item [RSSI Ref (NXDN Very Narrow)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'] [Center], [High'], [High]<br>Output<br>: 12dB SINAD level –1dB<br>MOD: OFF | | | | | | | |
| 13. Low RSSI Adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item [Low RSSI (Analog Wide)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'] [Center], [High'], [High]<br>Output: –118dBm (0.28µV)<br>MOD: 1.0kHz<br>DEV: ±3.0kHz | SSG | Rear | RX ANT | | PC ADJ | | Press [Apply] button to store the adjustment value. |
| 14. Low RSSI Adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item [Low RSSI (Analog Narrow)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'] [Center], [High'], [High]<br>Output: –118dBm (0.28µV)<br>MOD: 1.0kHz<br>DEV: ±1.5kHz | | | | | | | |



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# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications / Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 15 .Low RSSI Adjust [NXDN Very Narrow] | FPU Test mode<br>1) Adjust Item [Low RSSI (NXDN Very Narrow)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'] [Center], [High'], [High]<br>Output: –118dBm (0.28µV)<br>MOD: OFF | SSG | Rear | RX ANT | | PC ADJ | | Press [Apply] button to store the adjustment value. |
| 16. High RSSI Adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item [High RSSI (Analog Wide)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'] [Center], [High'], [High]<br>Output: –70dBm (70.7µV)<br>MOD: 1.0kHz<br>DEV: ±3.0kHz | SSG | Rear | RX ANT | | PC ADJ | | Press [Apply] button to store the adjustment value. |
| 17. High RSSI Adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item [High RSSI (Analog Narrow)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'] [Center], [High'], [High]<br>Output: –70dBm (70.7µV)<br>MOD: 1.0kHz<br>DEV: ±1.5kHz | | | | | | | |
| 18. High RSSI Adjust [NXDN Very Narrow] | FPU Test mode<br>1) Adjust Item [High RSSI (NXDN Very Narrow)]<br>Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: [Low], [Low'] [Center], [High'], [High]<br>Output: –70dBm (70.7µV)<br>MOD: OFF | | | | | | | |
| 19. Receiver Sensitivity Check [Analog Wide] | 1) Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: Desired Frequency<br>Output: –53dBm (501µV)<br>MOD = 1.0kHz<br>DEV: ±3.0kHz<br>AF: 0.45V/4Ω | SSG<br>Audio analyzer<br>Oscilloscope | Rear | RX ANT<br>TEST/ SPKR Jack pin 12<br>4Ω load | | | Check | –115dBm (0.4µV) or Less |
| [Analog Narrow] | 2) SSG setting<br>DEV: ±1.5kHz | | | | | | | |

# ADJUSTMENT

## Transmitter Section

| Item | Condition | Measurement | | | Adjustment | | | Specifications / Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 1. High Transmit Power Limit Adjust | FPU Test mode<br>1) Adjust Item: [High Transmit Power Limit Adjust]<br>Frequency: [Low], [Low'], [Center], [High'], [High]<br>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<br>1) Adjust Item: [High Transmit Power ]<br>Frequency: [Low], [Low'], [Center], [High'], [High]<br>Press [Transmit] button. | | | | | | 50W±0.5W | |
| 3. Low Transmit Power Limit Adjust | FPU Test mode<br>1) Adjust Item: [Low Transmit Power Limit Adjust ]<br>Frequency: [Low], [Low'], [Center], [High'], [High]<br>Press [Transmit] button. | | | | | | 28W±1.5W | |
| 4. Low Transmit Power Adjust | FPU Test mode<br>1) Adjust Item: [High Transmit Power Adjust ]<br>Frequency: [Low], [Low'], [Center], [High'], [High]<br>Press [Transmit] button. | | | | | | 25W±0.5W | |
| 5. Maximum Deviation Adjust [NXDN Narrow] | FPU Test mode<br>1) Adjust Item: [Maximum Deviation (NXDN Narrow)] | | | | | PC ADJ | Write the value as followings (typical value)<br>[Maximum Deviation (NXDN Narrow)] = 530 | Press [Apply] button to store the adjustment value. |
| 6. Maximum Deviation Adjust [NXDN Very Narrow] | FPU Test mode<br>1) Adjust Item: [Maximum Deviation (NXDN Very Narrow)] | | | | | | Write the value as followings (typical value)<br>[Maximum Deviation (NXDN Very Narrow)] = 530 | |
| 7. Maximum Deviation Adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [Maximum Deviation (Analog Wide)] | | | | | | Write the value as followings (typical value)<br>[Maximum Deviation (Analog Wide)] = 530 | |
| 8. Maximum Deviation Adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [Maximum Deviation (Analog Narrow)] | | | | | | Write the value as followings (typical value)<br>[Maximum Deviation (Analog Narrow)] = 530 | |



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# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications / Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 9. Balance Adjust [20Hz Adjustment] | FPU Test mode<br>1) Adjust Item: [Balance]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 3kHz<br>HPF: OFF<br>De-emphasis: OFF<br>2) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High]<br>Press [Transmit] button.<br>20Hz is transmitted. | Deviation meter<br>Oscilloscope | Rear | TX ANT | | PC ADJ | The Deviation of 20Hz frequency is fixed to 2.05kHz Deviation.<br>Change the 2kHz adjustment value to become the same deviation to 20Hz within the specified range. | 2kHz Tone deviation is within ±1.0% of 20Hz tone deviation.<br><br>Press [Apply All] button to store the adjustment value after all adjustment point was adjusted. |
| [2.0kHz Adjustment] | FPU Test mode<br>1) Adjust Item: [Balance]<br>[2kHz Sine Wave] check box is checked.<br>2) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High]<br>Press [Transmit] button.<br>Check while transmitting change to 2kHz. | | | | | | | |
| 10. Standard Modulation Check [Analog Wide ] | 1) Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz<br>HPF: OFF<br>De-emphasis: OFF<br>Detector: (p-p)/2<br>2) Connect the AG to the MIC Terminal of MIC connector.<br>AG Frequency<br>: 1kHz (Sine Wave)<br>AG Output level: Adjust to become the 3kHz Deviation. | Deviation meter<br>Oscilloscope<br>AG<br>DVM | Rear<br><br>Front | TX ANT<br><br>MIC | | | Check | 5.0mV±1.5mV |
| [Analog Narrow ] | 1) Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz<br>HPF: OFF<br>De-emphasis: OFF<br>Detector: (p-p)/2<br>2) Connect the AG to the MIC Terminal of MIC connector.<br>AG Frequency<br>: 1kHz (Sine Wave)<br>AG Output level: Adjust to become the 1.5kHz Deviation. | | | | | | | |



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# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications / Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 11. TD Deviation adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [TD Deviation (Analog Wide)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 3kHz, HPF: OFF<br>De-emphasis: OFF<br>2) Connect the AG to the TD Terminal of Control I/O Jack.<br>AG Frequency<br>: 100Hz (Sine Wave)<br>AG Output level<br>: 0.5Vpp (177mVrms)<br>Press [Transmit] button. | Deviation meter<br>Oscilloscope<br>AG<br>AF VTVM | Rear | TX ANT<br><br>Control I/O Jack TD (Pin No.8) | | PC ADJ | 0.75kHz Deviation | ±0.1kHz<br><br>Press [Apply] button to store the adjustment value. |
| 12. TD Deviation adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [TD Deviation (Analog Narrow)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 3kHz, HPF: OFF<br>De-emphasis: OFF<br>2) Connect the AG to the TD Terminal of Control I/O Jack.<br>AG Frequency<br>: 100Hz (Sine Wave)<br>AG Output level<br>: 0.5Vpp (177mVrms)<br>Press [Transmit] button. | | | | | | | |
| 13. Transmit Audio Input (TA) adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [Transmit Audio Input (TA) (Analog Wide)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz, HPF: OFF<br>De-emphasis: OFF<br>2) Connect the AG to the TA Terminal of Control I/O Jack.<br>AG Frequency<br>: 1kHz (Sine Wave)<br>AG Output level: 280mVrms<br>Press [Transmit] button. | Deviation meter<br>Oscilloscope<br>AG<br>AF VTVM | Rear | TX ANT<br><br>Control I/O Jack TA (Pin No.9) | | PC ADJ | 3.0kHz Deviation | ±0.1kHz<br><br>Press [Apply] button to store the adjustment value. |
| 14. Transmit Audio Input (TA) adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [Transmit Audio Input (TA) (Analog Narrow)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz, HPF: OFF<br>De-emphasis: OFF<br>2) Connect the AG to the TA Terminal of Control I/O Jack.<br>AG Frequency<br>: 1kHz (Sine Wave)<br>AG Output level: 280mVrms<br>Press [Transmit] button. | | | | | | 1.5kHz Deviation | ±0.05kHz<br><br>Press [Apply] button to store the adjustment value. |



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# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications / Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 15. QT Deviation adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [QT Deviation (Analog Wide)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 3kHz, HPF: OFF<br>De-emphasis: OFF<br>Detector: p-p/2<br>Press [Transmit] button. | Deviation meter<br>Oscilloscope | Rear | TX ANT | | PC ADJ | 0.75kHz Deviation | ±0.05kHz<br><br>Press [Apply] button to store the adjustment value. |
| 16. QT Deviation adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [QT Deviation (Analog Narrow)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 3kHz, HPF: OFF<br>De-emphasis: OFF<br>Detector: p-p/2<br>Press [Transmit] button. | | | | | | 0.35kHz Deviation | ±0.05kHz<br><br>Press [Apply] button to store the adjustment value. |
| 17. DQT Deviation adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [DQT Deviation (Analog Wide)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 3kHz, HPF: OFF<br>De-emphasis: OFF<br>Detector: Peak hold<br>Press [Transmit] button. | | | | | | 0.75kHz Deviation | ±0.05kHz<br><br>Press [Apply] button to store the adjustment value. |
| 18. DQT Deviation adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [DQT Deviation (Analog Narrow)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 3kHz, HPF: OFF<br>De-emphasis: OFF<br>Detector: Peak hold<br>Press [Transmit] button. | | | | | | 0.35kHz Deviation | ±0.05kHz<br><br>Press [Apply] button to store the adjustment value. |
| 19. DTMF Deviation adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [DTMF Deviation (Analog Wide)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz, HPF: OFF<br>De-emphasis: OFF<br>Press [Transmit] button. | Deviation meter<br>Oscilloscope | Rear | TX ANT | | PC ADJ | 3.0kHz Deviation | ±0.1kHz<br><br>Press [Apply] button to store the adjustment value. |
| 20. DTMF Deviation adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [DTMF Deviation (Analog Narrow)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz, HPF: OFF<br>De-emphasis: OFF<br>Press [Transmit] button. | | | | | | 1.5kHz Deviation | ±0.05kHz<br><br>Press [Apply] button to store the adjustment value. |



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# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications / Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 21. Test Tone Deviation adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [Test Tone Deviation (Analog Wide)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz<br>HPF: OFF<br>De-emphasis: OFF<br>Press [Transmit] button. | Deviation meter<br>Oscilloscope | Rear | TX ANT | | PC ADJ | 3.0kHz Deviation | ±0.1kHz<br><br>Press [Apply] button to store the adjustment value. |
| 22. Test Tone Deviation adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [Test Tone Deviation (Analog Narrow)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz<br>HPF: OFF<br>De-emphasis: OFF<br>Press [Transmit] button. | | | | | | 1.5kHz Deviation | ±0.05kHz<br><br>Press [Apply] button to store the adjustment value. |
| 23. CW ID Deviation adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [CW ID Deviation (Analog Wide)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz<br>HPF: OFF<br>De-emphasis: OFF<br>Press [Transmit] button. | | | | | | 2.0kHz Deviation | ±0.1kHz<br><br>Press [Apply] button to store the adjustment value. |
| 24. CW ID Deviation adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [CW ID Deviation (Analog Narrow)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz<br>HPF: OFF<br>De-emphasis: OFF<br>Press [Transmit] button. | | | | | | 1.0kHz Deviation | ±0.05kHz<br><br>Press [Apply] button to store the adjustment value. |
| 25. Courtesy Tone Deviation adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [Courtesy Tone Deviation (Analog Wide)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz<br>HPF: OFF<br>De-emphasis: OFF<br>Press [Transmit] button. | | | | | | 1.0kHz Deviation | ±0.05kHz<br><br>Press [Apply] button to store the adjustment value. |
| 26. Courtesy Tone Deviation adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [Courtesy Tone Deviation (Analog Narrow)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz<br>HPF: OFF<br>De-emphasis: OFF<br>Press [Transmit] button. | | | | | | 0.5kHz Deviation | ±0.05kHz<br><br>Press [Apply] button to store the adjustment value. |



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# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications / Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 27. Repeat Gain adjust [Analog Wide] | FPU Test mode<br>1) Adjust Item: [Repeat Gain (Analog Wide)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz<br>HPF: OFF<br>De-emphasis: OFF<br>2) Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: Desired Frequency<br>Output: –53dBm (501µV)<br>MOD: 1.0kHz<br>DEV: ±1.0kHz | Deviation meter<br>Oscilloscope<br><br>SSG | Rear | TX ANT<br><br><br><br>RX ANT | | PC ADJ | 1.0kHz Deviation | ±0.1kHz<br><br>Press [Apply] button to store the adjustment value. |
| 28. Repeat Gain adjust [Analog Narrow] | FPU Test mode<br>1) Adjust Item: [Repeat Gain (Analog Narrow)]<br>Connect the Deviation Meter to the TX ANT end via the ATT.<br>Deviation Meter setting<br>LPF: 15kHz<br>HPF: OFF<br>De-emphasis: OFF<br>2) Connect the SSG to the RX ANT.<br>SSG setting<br>Frequency: Desired Frequency<br>Output: –53dBm (501µV)<br>MOD: 1.0kHz<br>DEV: ±1.0kHz | | | | | | | |

# TERMINAL FUNCTION

## Final Unit (X45-3920-10) (A/3)

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| **CN1 (To X57-794 CN610)** | | | |
| 1 | TX IN | I | TX driver input signal (Coaxial) |
| **CN201 (To X45-392 B/3 +B)** | | | |
| 1 | +B | I | Power supply input |
| **CN202 (To X45-392 B/3 GND)** | | | |
| 1 | GND | - | Ground |
| **CN203 (To X57-794 CN701)** | | | |
| 1 | GND | - | Ground |
| 2 | +B | O | Power supply output |
| 3 | +B | O | Power supply output |
| **CN204 (To X57-794 CN801)** | | | |
| 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 |
| **CN205 (To FAN)** | | | |
| 1 | FAB | O | FAN power supply |
| 2 | FAG | - | FAN ground |

## Final Unit (X45-3920-10) (B/3)

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| **+B (To X45-392 A/3 CN201)** | | | |
| 1 | +B | O | Power supply output |
| **GND (To X45-392 A/3 CN202)** | | | |
| 1 | GND | - | Ground |
| **+B1 (To DC 13.6V)** | | | |
| 1 | +B | I | Power supply input |
| **GND (To DC 13.6V)** | | | |
| 1 | GND | - | Ground |

## Final Unit (X45-3920-10) (C/3)

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| **N_SYNC (To X53-449 CN5)** | | | |
| 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 |
| **J401, 402 (N_SYNC1, 2 jack)** | | | |
| 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 |

## Control Unit (X53-4490-10)

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| **CN5 (To X45-392 C/3 )** | | | |
| 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 |
| **CN38 (To X57-794 CN800)** | | | |
| 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 |
| 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 |



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# TERMINAL FUNCTION

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| 26 | AGC | O | Auto gain control voltage |
| 27 | 33A | O | 3.3V voltage |
| 28 | /EWP | O | EEPROM write control signal |
| 29 | HWV1 | 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 |
| **CN39** | | | |
| IN | IF_SIG | I | 450kHz IF signal |
| OUT | GND | - | Ground |
| **CN40 (To X54-358 CN502)** | | | |
| 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 |
| 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 |
| **CN41 (To TEST/SPKR 15pin Connector)** | | | |
| 1 | SB | O | Power supply output |
| 2 | SB | O | Power supply input |
| 3 | GND | - | Ground |
| 4 | GND | - | Ground |
| **CN42 (To TEST/SPKR 15pin Connector)** | | | |
| 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 |

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| 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 |
| **CN43 (To INT SPKR )** | | | |
| 1 | SPO | O | Internal speaker AF output |
| 2 | SPG | - | Speaker ground |
| **CN44 (To Control I/O 25pin D-sub Connector)** | | | |
| 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) |
| 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 |
| **CN301 (To X57-794 CN700)** | | | |
| 1 | GND | - | Ground |
| 2 | +B | I | Power supply input |
| 3 | SB | I | Power supply input |

# TERMINAL FUNCTION

## Display Unit (X54-3580-20) (A/2)

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| **CN501 (To X54-358 CN601)** | | | |
| 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 |
| **CN502 (To X53-449 CN40)** | | | |
| 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 |
| 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 (X54-3580-20) (B/2)

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| **CN601 (To X54-358 CN501)** | | | |
| 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 |
| **J601 (MIC jack)** | | | |
| 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 |

## TX-RX Unit (X57-7940-10)

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| **CN101 (To RX ANT)** | | | |
| 1 | RX_SIGNAL | I | Receive signal input (Coaxial) |
| **CN202 (To X58-507 CN350)** | | | |
| 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 |
| **CN203 (To X58-507 CN351)** | | | |
| 1 | Vo | I | VCO input |
| 2 | GND | - | Ground |
| **CN204 (To X58-507 CN303)** | | | |
| 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 |
| **CN500 (To Ext IN)** | | | |
| 1 | REF IN | I | External reference input (Coaxial) |
| **CN605 (To X58-508 CN350)** | | | |
| 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 |



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# TERMINAL FUNCTION

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| 7 | TXASSIST | O | Assist voltage output |
| **CN608 (To X58-508 CN351)** | | | |
| 1 | VO | I | VCO input |
| 2 | GND | - | Ground |
| **CN609 (To X58-508 CN303)** | | | |
| 1 | FIN | O | VCO output |
| 2 | SPSCLK0 | O | PLL clock output |
| 3 | /TXPCS | 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 | LDT | I | PLL lock detect input |
| 8 | REF | O | 16.8MHz reference clock output |
| **CN610 (To X45-392 A/3 CN1)** | | | |
| 1 | TX OUT | O | TX driver output signal (Coaxial) |
| **CN700 (To X53-449 CN301)** | | | |
| 1 | GND | - | Ground |
| 2 | +B | O | Power supply output |
| 3 | SB | O | Power supply output |
| **CN701 (To X45-392 A/3 CN203)** | | | |
| 1 | GND | - | Ground |
| 2 | +B | I | Power supply input |
| 3 | +B | I | Power supply input |
| **CN800 (To X53-449 CN38)** | | | |
| 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 | HWV1 | 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 |

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| 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 |
| 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 |
| **CN801 (To X45-392 A/3 CN204)** | | | |
| 1 | HWV2 | 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 |
| **CN802 (To X53-449 CN39)** | | | |
| 1 | IF_SIG | O | 450kHz IF signal (Coaxial) |

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

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| **CN303 (To X57-794 CN204)** | | | |
| 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 |
| **CN350 (To X57-794 CN202)** | | | |
| 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 |

# TERMINAL FUNCTION

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| 6 | NC | - | No connection |
| 7 | RXASSIST | I | Assist voltage input |
| **CN351 (To X57-794 CN203)** | | | |
| 1 | VO | O | VCO output |
| 2 | GND | - | Ground |

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

| Pin No. | Name | I/O | Function |
|---|---|---|---|
| **CN303 (To X57-794 CN609)** | | | |
| 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 |
| **CN350 (To X57-794 CN605)** | | | |
| 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 |
| **CN351 (To X57-794 CN608)** | | | |
| 1 | VO | O | VCO output |
| 2 | GND | - | Ground |

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

| Pin No. | Pin Name | I/O | Signal Type | Modifi-cation | Description/ Port Type |
|---|---|---|---|---|---|
| 1 | NC | - | - | Land short | - |
| 2 | RXD2 | I | Digital | No | Asynchronous Receive Data |
| 3 | TXD2 | O | Digital | No | Asynchronous Send Data |
| 4 | AI1 | I | Digital | No | Programmable Function Input 1/ CMOS |
| 5 | AI2 | I | Digital | No | Programmable Function Input 2/ CMOS |
| 6 | AI3 | I | Digital | No | Programmable Function Input 3/ CMOS |
| 7 | DG | - | GND | No | Digital GND |
| 8 | TD | I | Analog | No | TX Data Input (signaling) |
| 9 | TA | I | Analog | No | TX Audio Input (voice) |
| 10 | RD | O | Analog | No | RX Data Output (signaling) Not Squelched |
| 11 | RA | O | Analog | No | RX Audio Output (voice) Squelched |
| 12 | RXG | - | GND | No | RX Signal GND |
| 13 | SPM | I | Digital | No | Speaker Mute/ CMOS |
| 14 | BER_CLK | O | Digital | No | for Bit Error Rate Clock |
| 15 | EMON | I | Digital | No | External Monitor Switch |
| 16 | EPTT | I | Digital | No | External PTT Switch |
| 17 | SC | O | Digital | No | Squelch Control |
| 18 | BER_DAT | O | Digital | No | for Bit Error Rate Data |
| 19 | TXG | - | GND | No | TX Siganl GND |
| 20 | IO1 | I/O | Digital | No | Programmable Function I/O 1 |
| 21 | IO2 | I/O | Digital | No | Programmable Function I/O 2 |
| 22 | IO3 | I/O | Digital | No | Programmable Function I/O 3 |
| 23 | IO4 | I/O | Digital | No | Programmable Function I/O 4 |
| 24 | IO5 | I/O | Digital | No | Programmable Function I/O 5 |
| 25 | IO6 | I/O | Digital | No | Programmable Function I/O 6 |

## TEST/SPKR 15 pin Connector

| Pin No. | Pin Name | I/O | Signal Type | Modifi-cation | Description/ Port Type |
|---|---|---|---|---|---|
| 1 | SB | - | Power | No | Power Supply |
| 2 | SB | - | Power | No | Power Supply |
| 3 | NC | - | - | No | - |
| 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 |
| 8 | RSSI | O | Analog | No | RSSI Output |
| 9 | SPI | I | Analog | No | Internal Speaker Input |
| 10 | AO1 | O | Digital | Default | Auxiliary Output 1 Open collector |
| | | | | $R203=47k D23=delete | Auxiliary Output 1 Open collector with PU |
| 11 | AO2 | O | Digital | Default | Auxiliary Output 2 Open collector |
| | | | | $R202=47k D29=delete | Auxiliary Output 2 Open collector with PU |
| 12 | SPO | O | Analog | No | External Speaker Output |
| 13 | AO3 | O | Digital | Default | Auxiliary Output 3 Open collector |
| | | | | $R201=47k D31=delete | Auxiliary Output 3 Open collector with PU |
| 14 | AO4 | O | Digital | Default | Auxiliary Output 4 Open collector |
| | | | | $R200=47k D35=delete | Auxiliary Output 4 Open collector with PU |
| 15 | AO5 | O | Digital | Default | Auxiliary Output 5 Open collector |
| | | | | $R198=47k D12=delete | Auxiliary Output 5 Open collector with PU |



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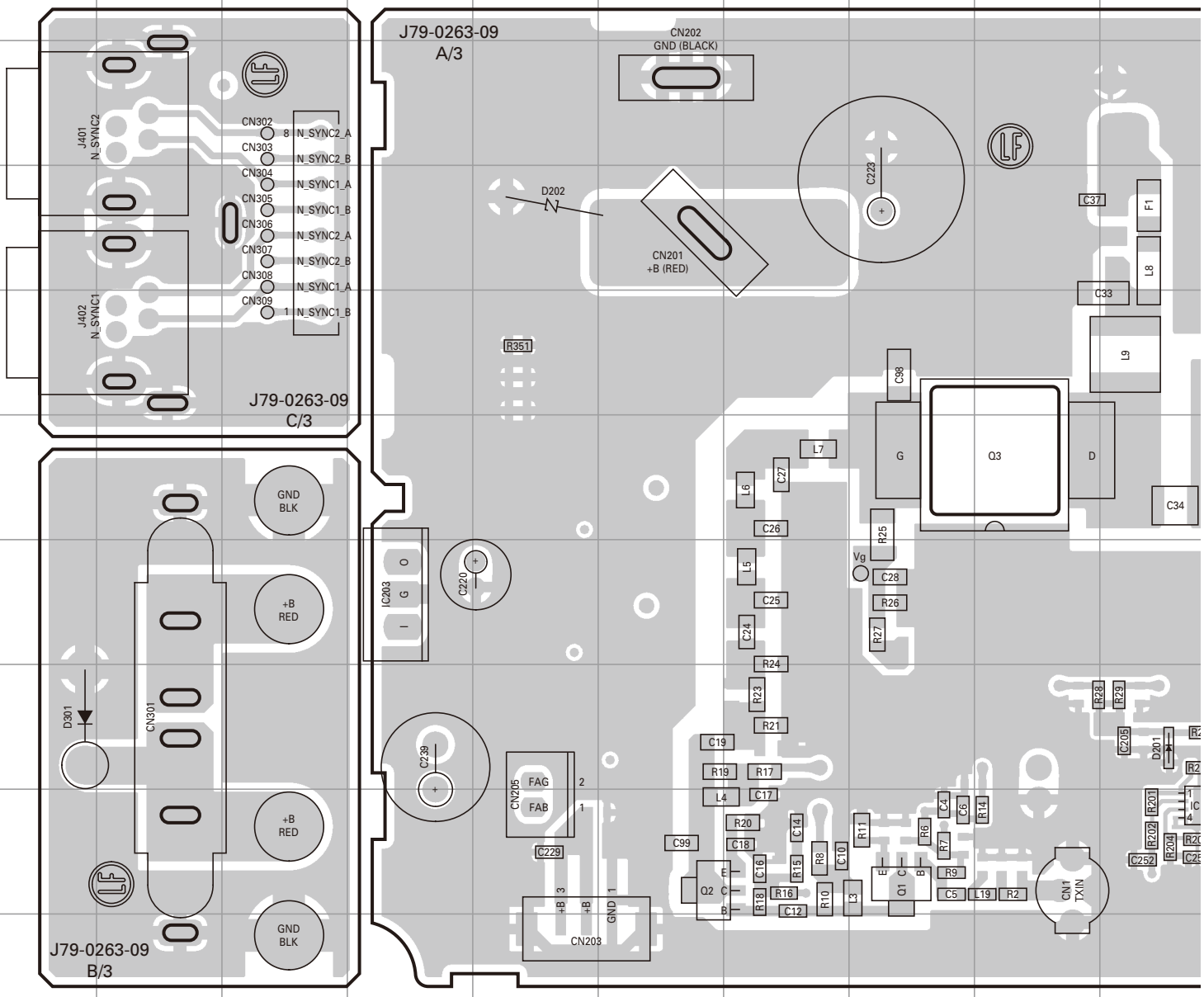
# NXR-710 PC BOARD

## FINAL UNIT (X45-3920-10)
## Component side view (J79-0263-09)




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



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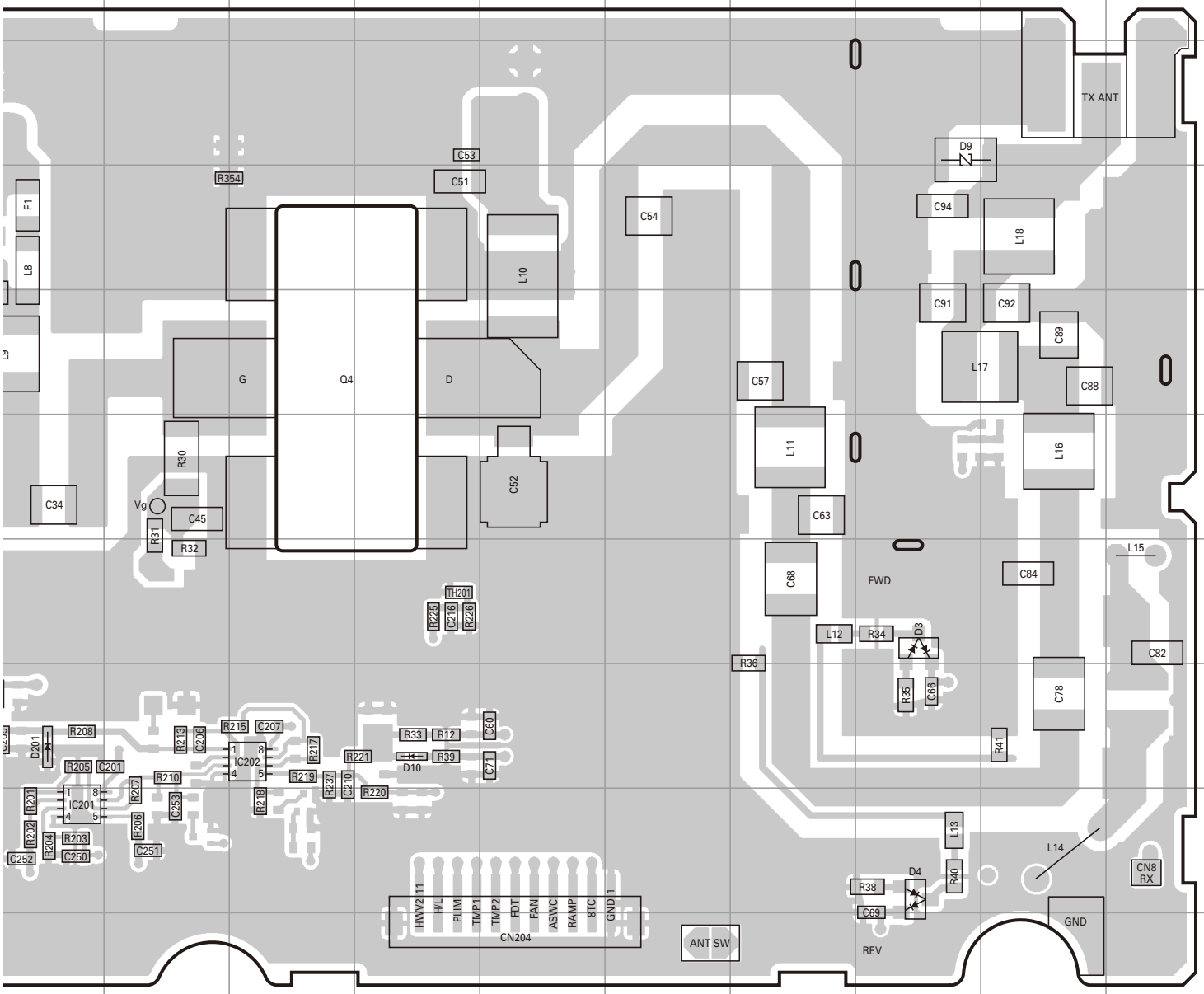
## FINAL UNIT (X45-3920-10)
## Component side view (J79-0263-09)




Component side

| | |
|---|---|
| Layer 1 | |
| Layer 2 | |
| Layer 3 | |
| Layer 4 | |

Foil side



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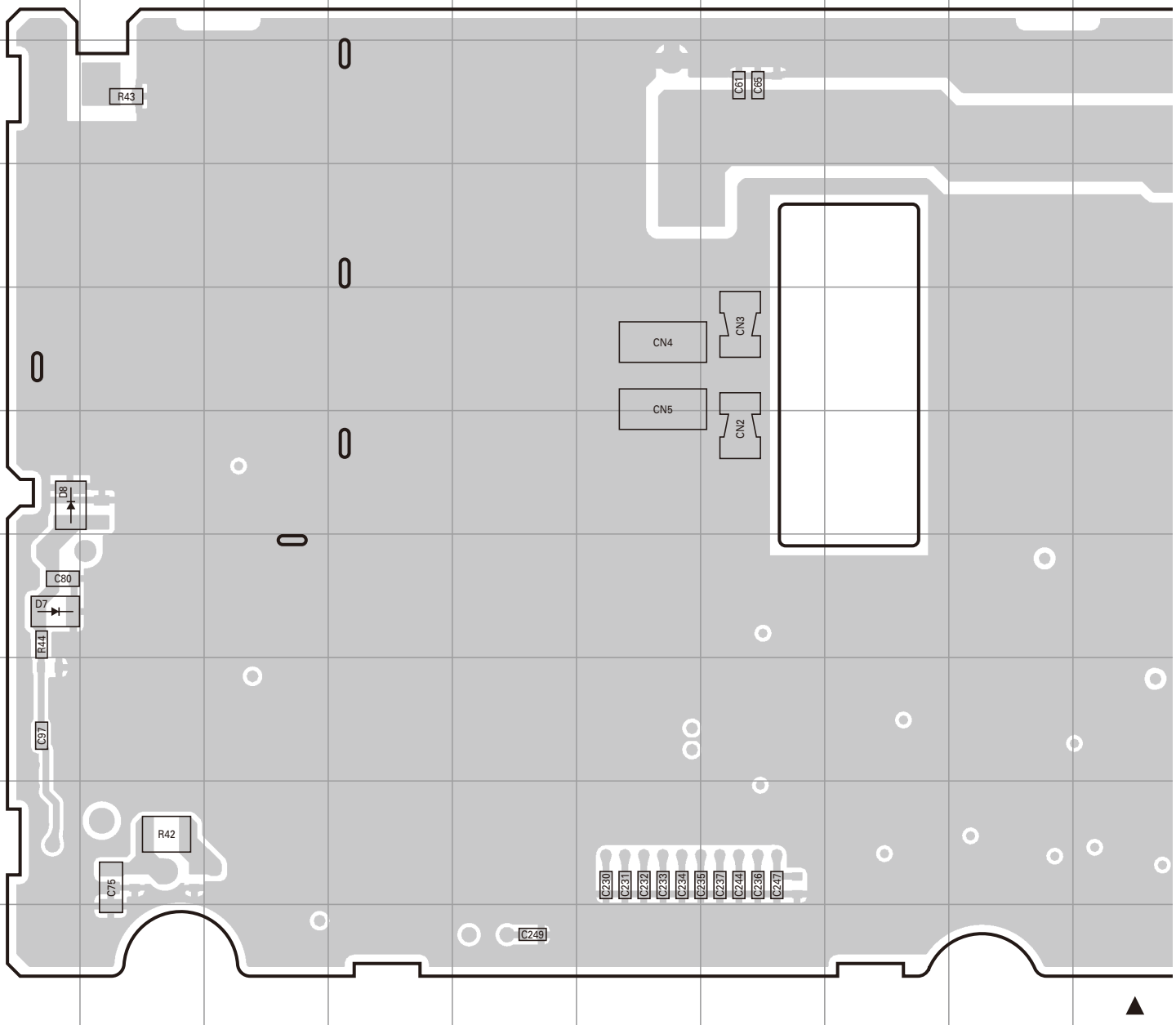
# NXR-710 PC BOARD

## FINAL UNIT (X45-3920-10)
## Foil side view (J79-0263-09)




| Ref. No. | Address |
|---|---|
| Q203 | 7O |
| Q204 | 6O |
| Q205 | 7O |
| Q206 | 6O |
| Q207 | 8O |
| D1 | 8 L |
| D7 | 7A |
| D8 | 6A |
| D203 | 9O |



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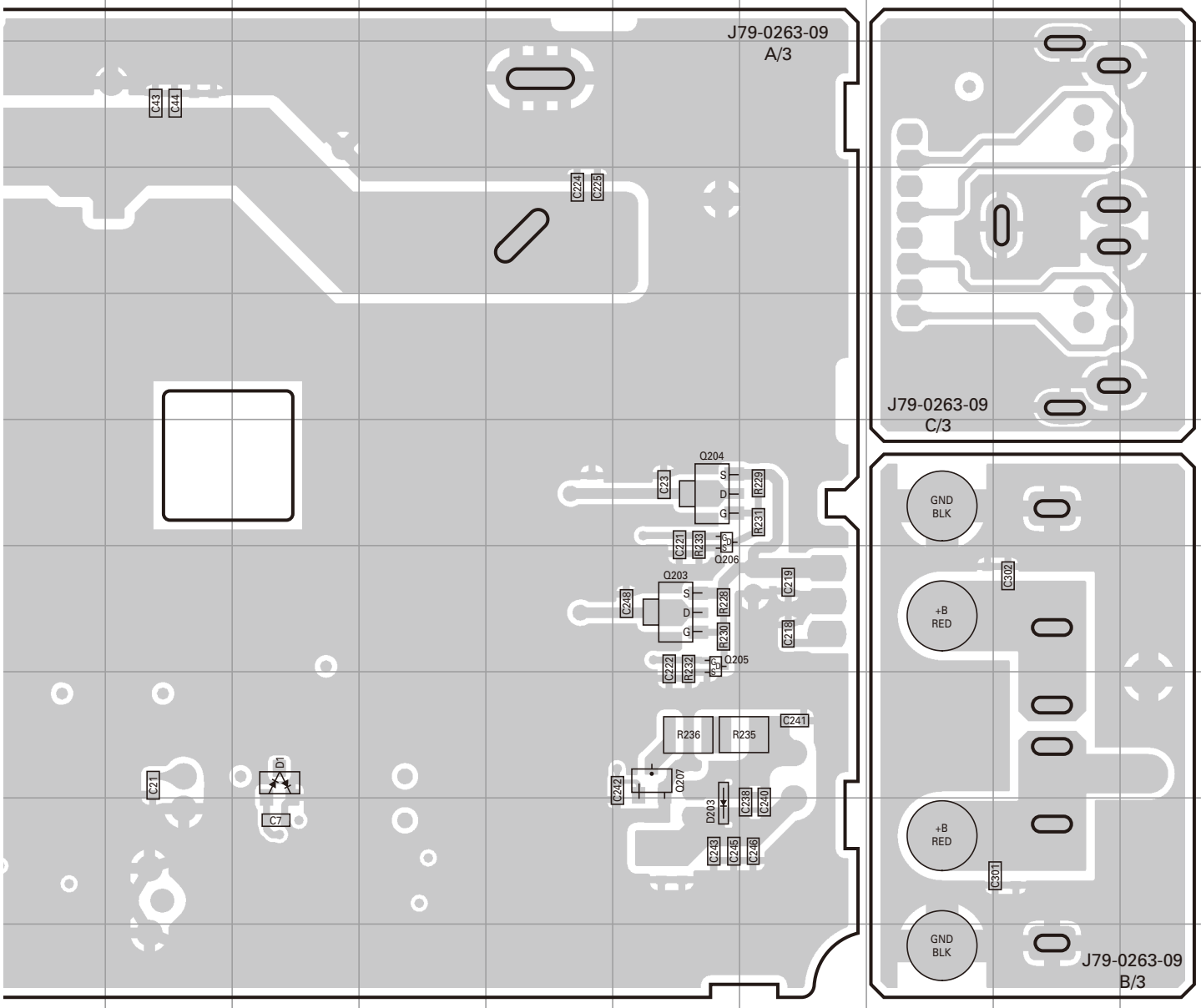
# PC BOARD NXR-710

## FINAL UNIT (X45-3920-10)
## Foil side view (J79-0263-09)




Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side



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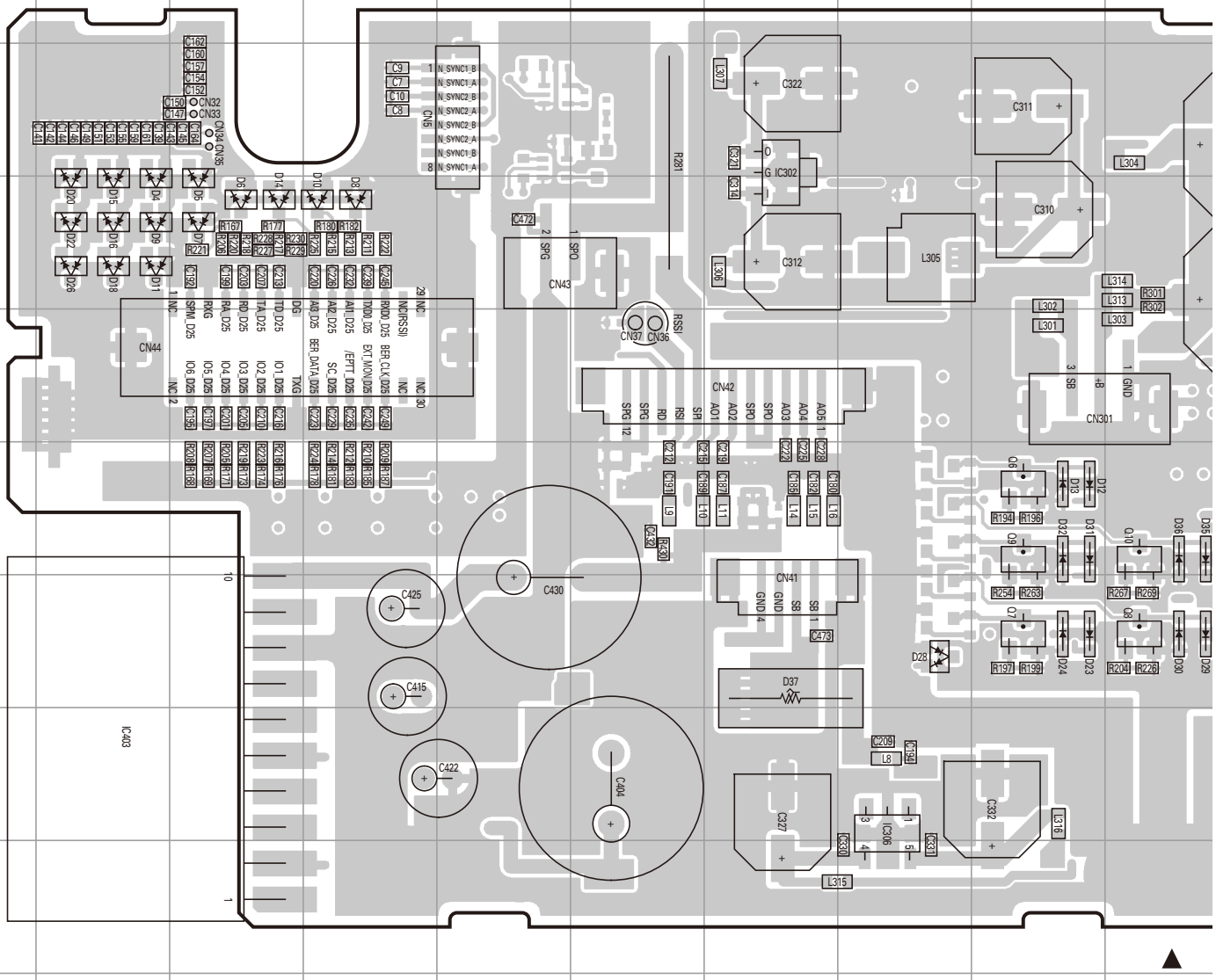
# NXR-710 PC BOARD

## 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 | | |



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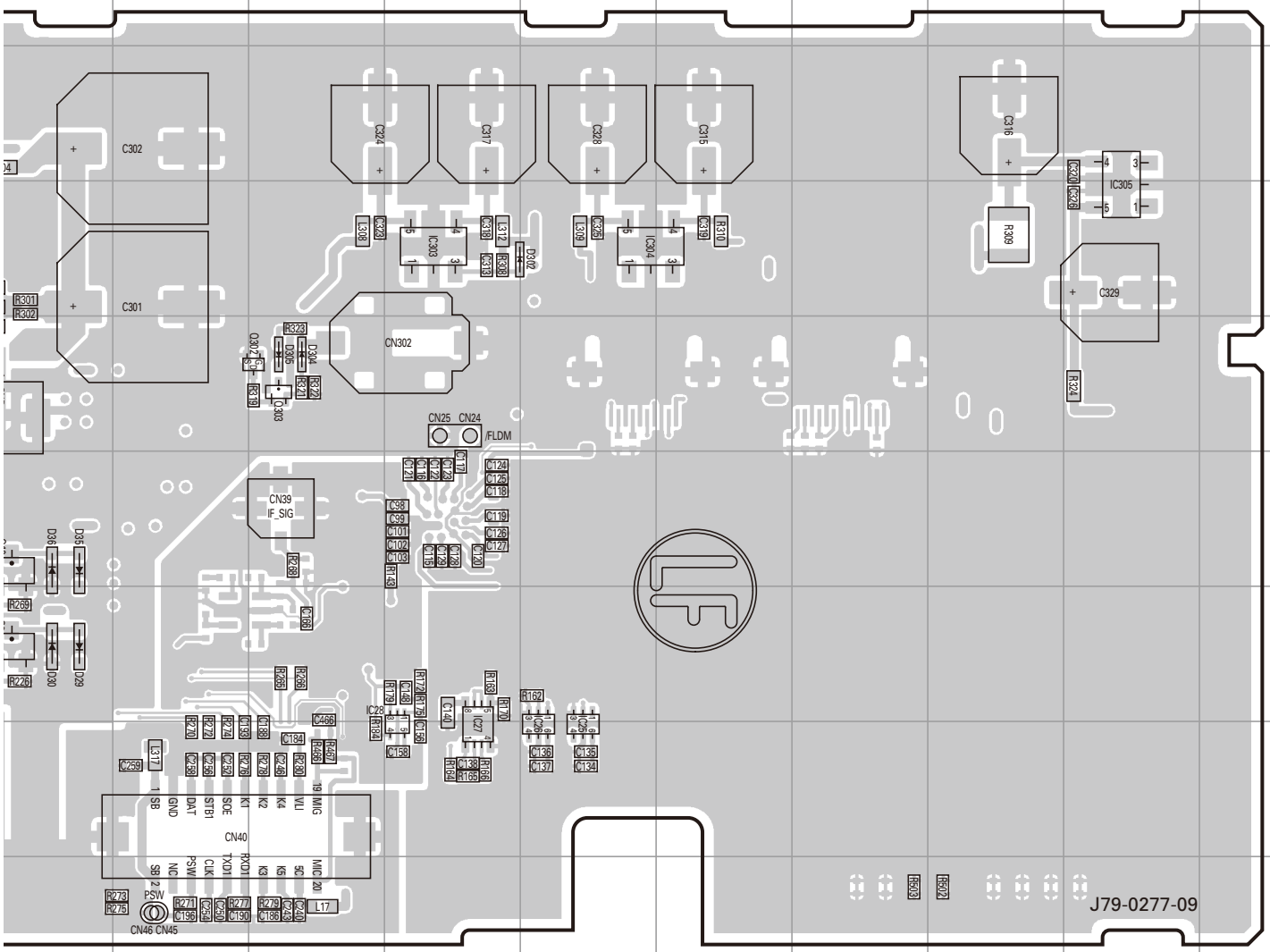
# PC BOARD NXR-710

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




Component side
Layer 1
Layer 2
Layer 3
Layer 4
Layer 5
Layer 6
Foil side



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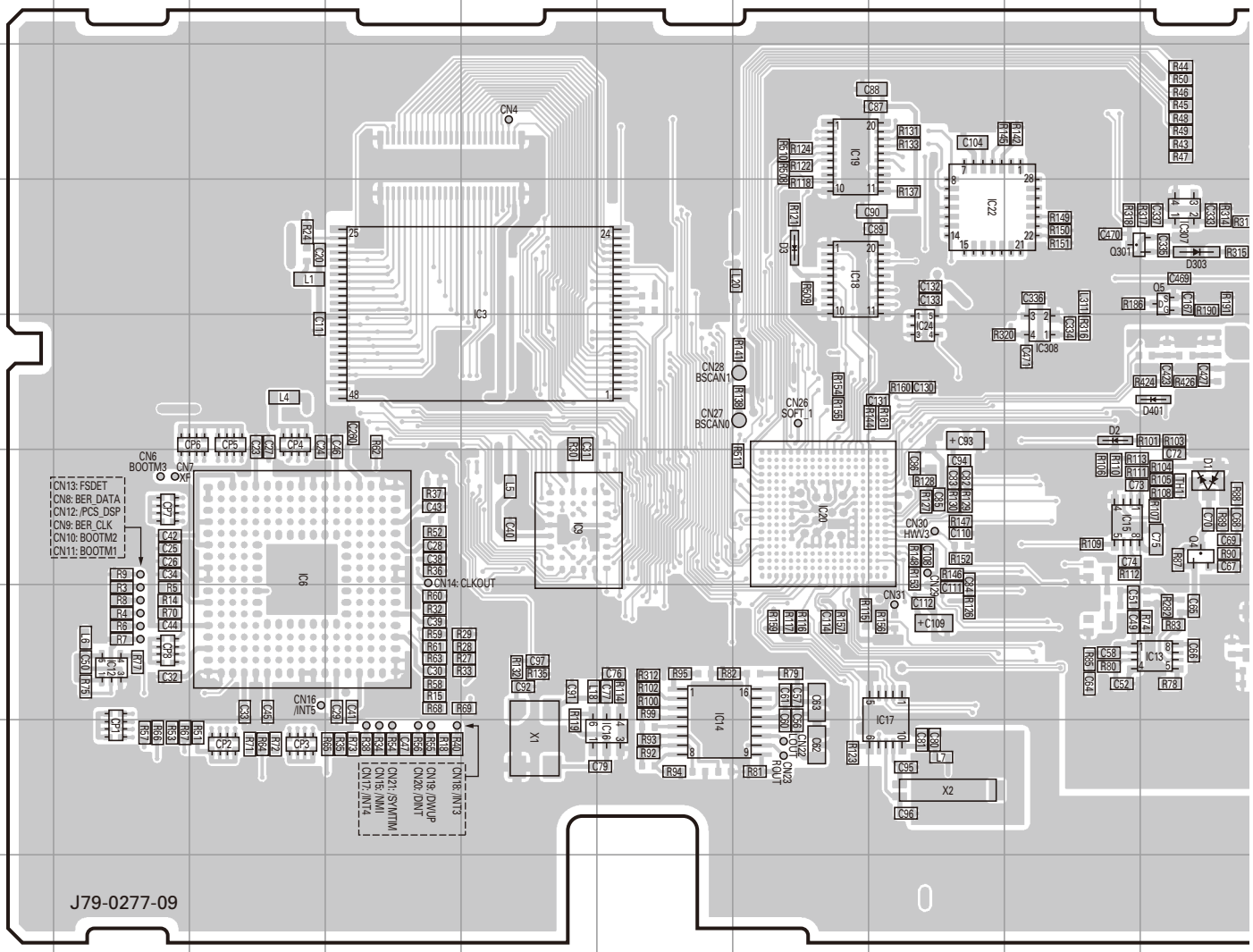
# NXR-710 PC BOARD

## 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 | | |



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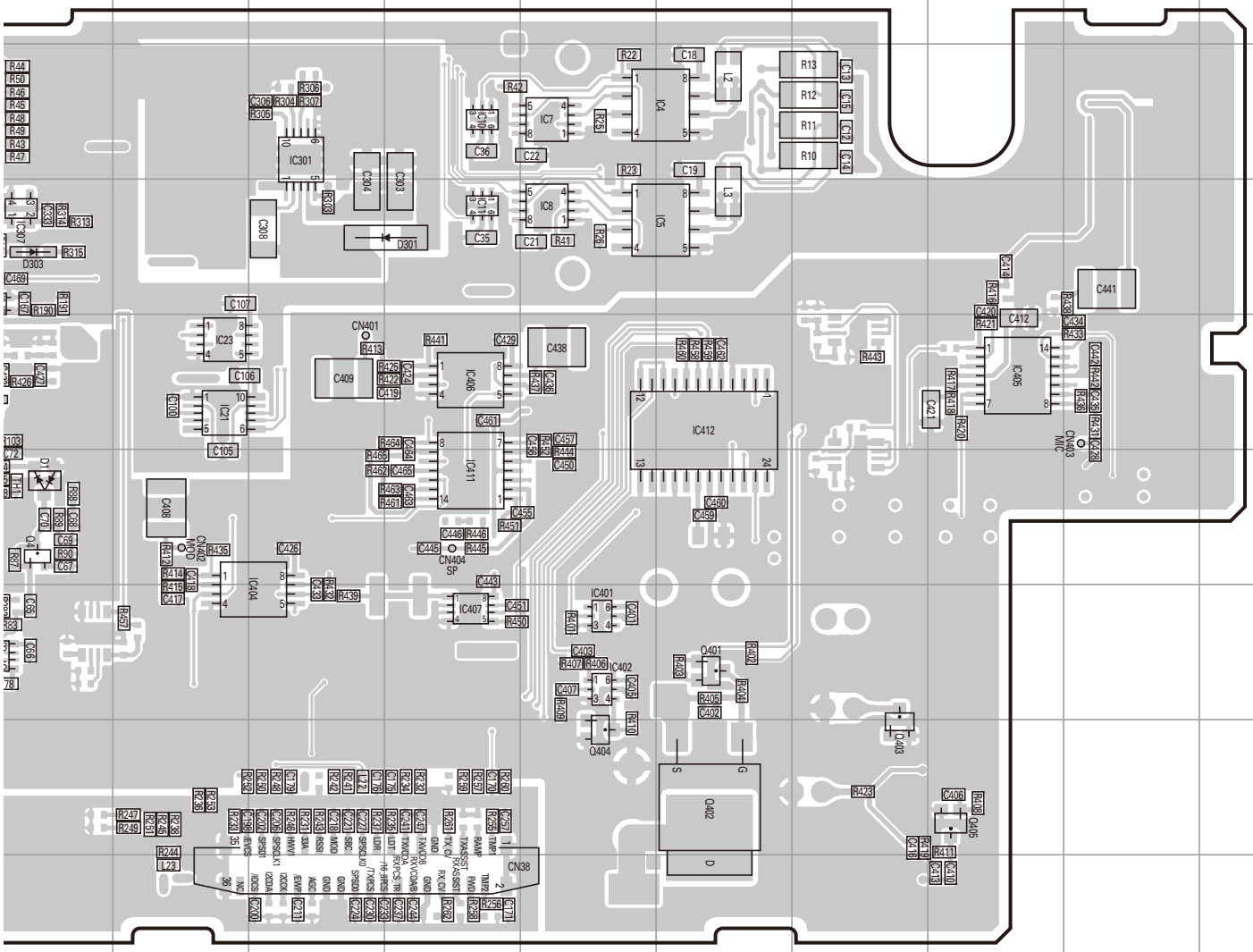
# PC BOARD NXR-710

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




Component side

| | |
|---|---|
| Layer 1 | |
| Layer 2 | |
| Layer 3 | |
| Layer 4 | |
| Layer 5 | |
| Layer 6 | |

Foil side



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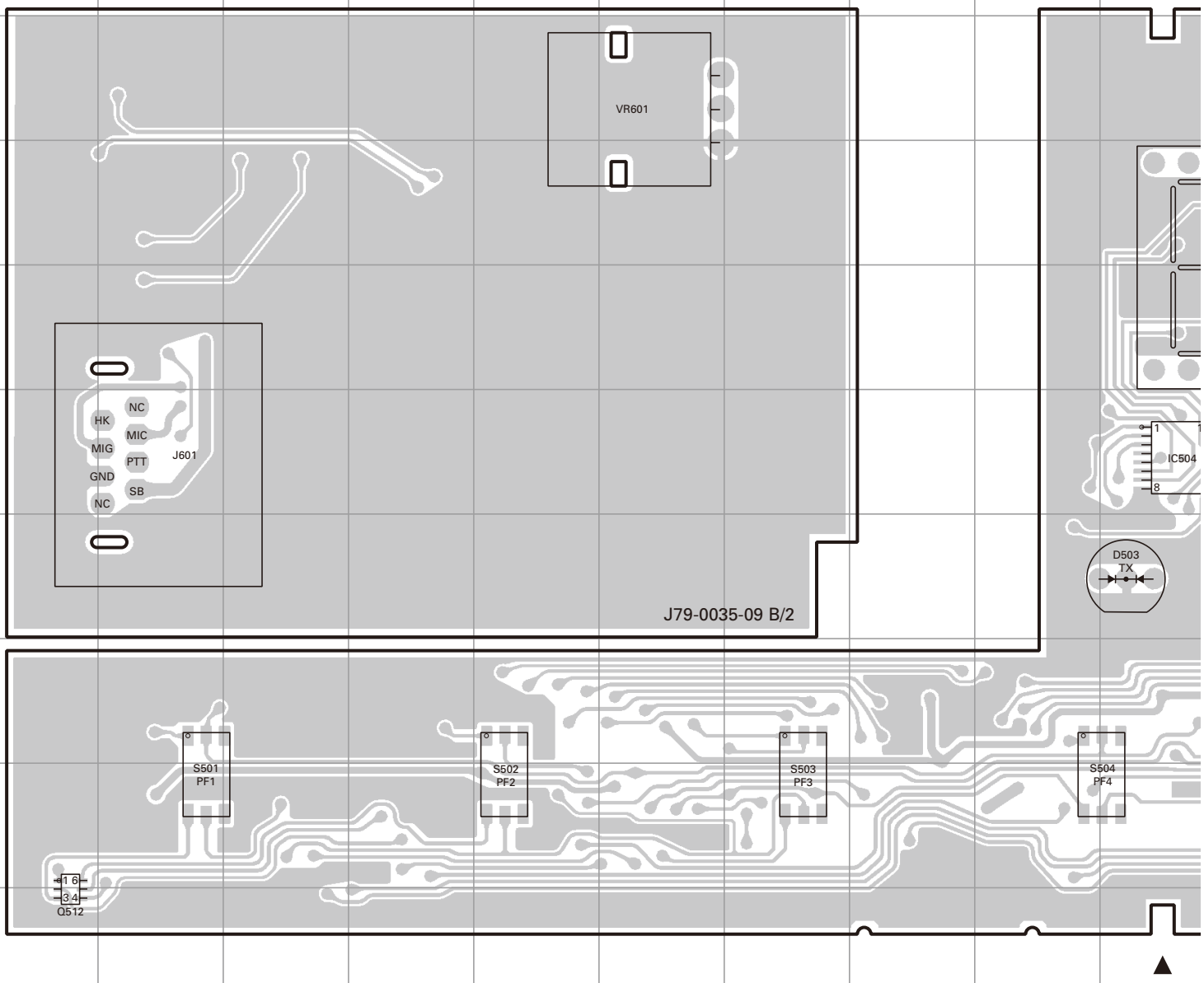
# NXR-710 PC BOARD

## DISPLAY UNIT (X54-3580-20) Component side view (J79-0035-09)



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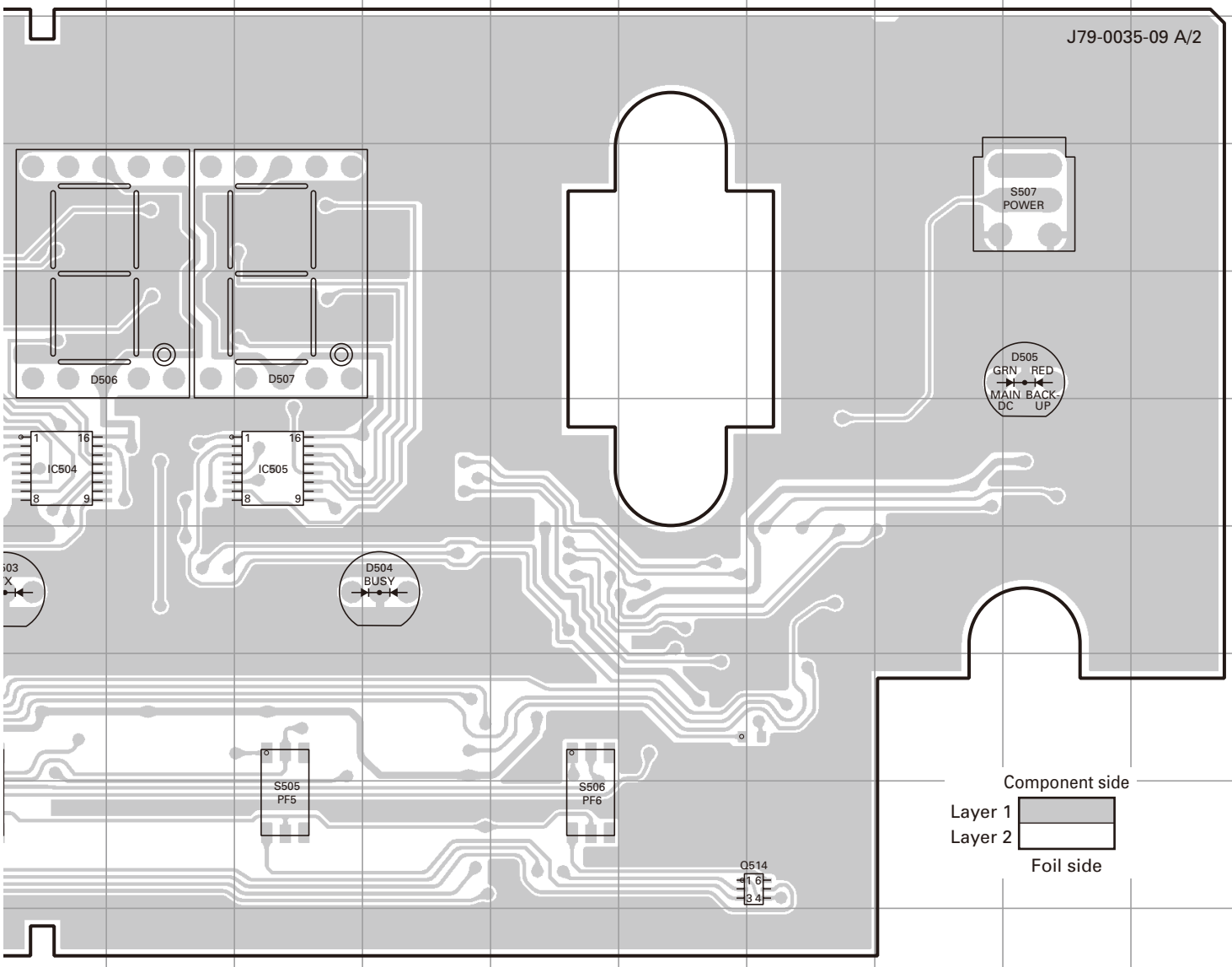
# PC BOARD NXR-710

## DISPLAY UNIT (X54-3580-20) Component side view (J79-0035-09)




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



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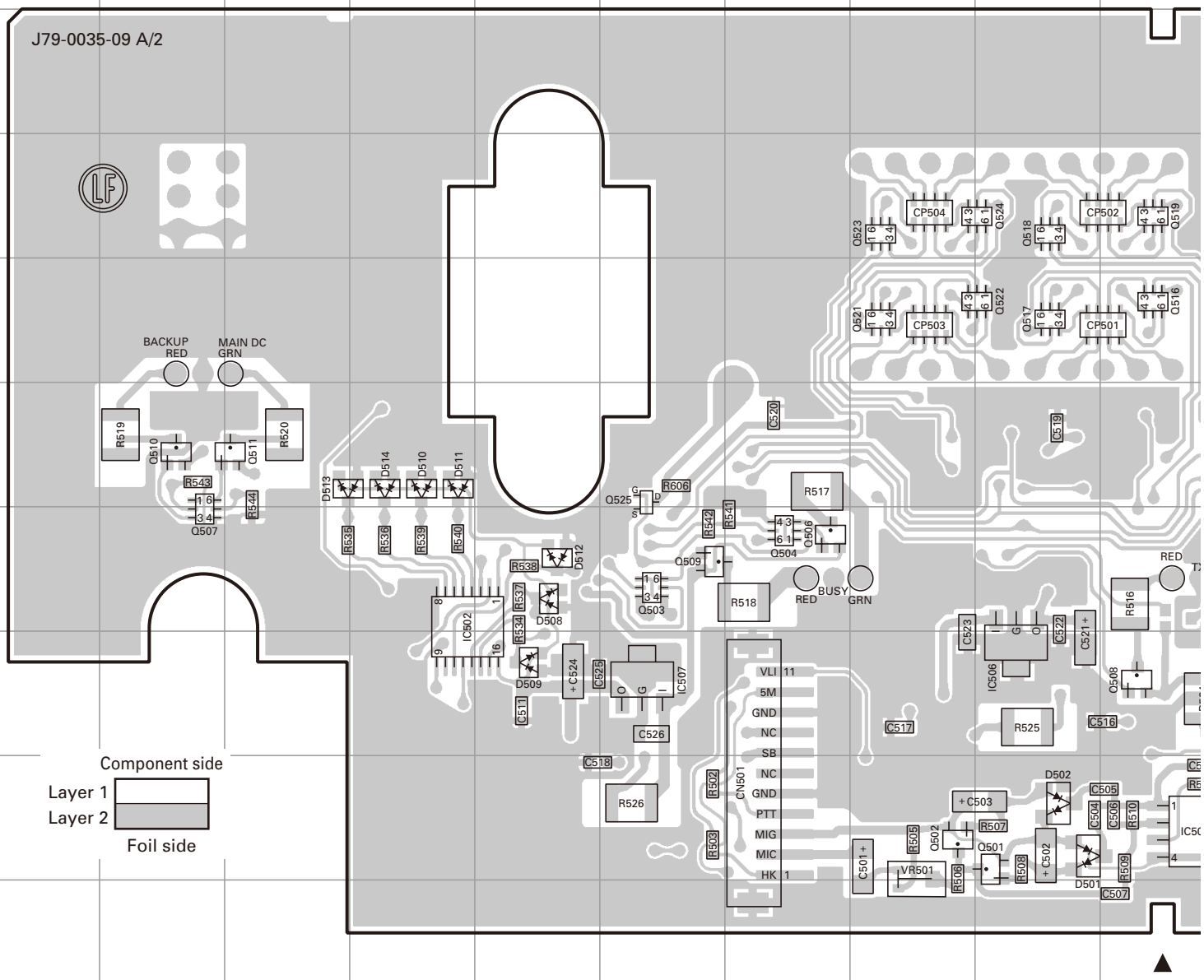
# NXR-710 PC BOARD

## DISPLAY UNIT (X54-3580-20) Foil side view (J79-0035-09)




| Ref. No. | Address | Ref. No. | Address | Ref. No. | Address | Ref. No. | Address |
|---|---|---|---|---|---|---|---|
| IC501 | 9J | Q507 | 7B | Q521 | 5H | D511 | 6D |
| IC502 | 7D | Q508 | 8J | Q522 | 5I | D512 | 7E |
| IC503 | 9P | Q509 | 7F | Q523 | 4H | D513 | 6C |
| IC506 | 8I | Q510 | 6B | Q524 | 4I | D514 | 6D |
| IC507 | 8F | 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 | | |
| Q506 | 7G | Q519 | 4J | D510 | 6D | | |



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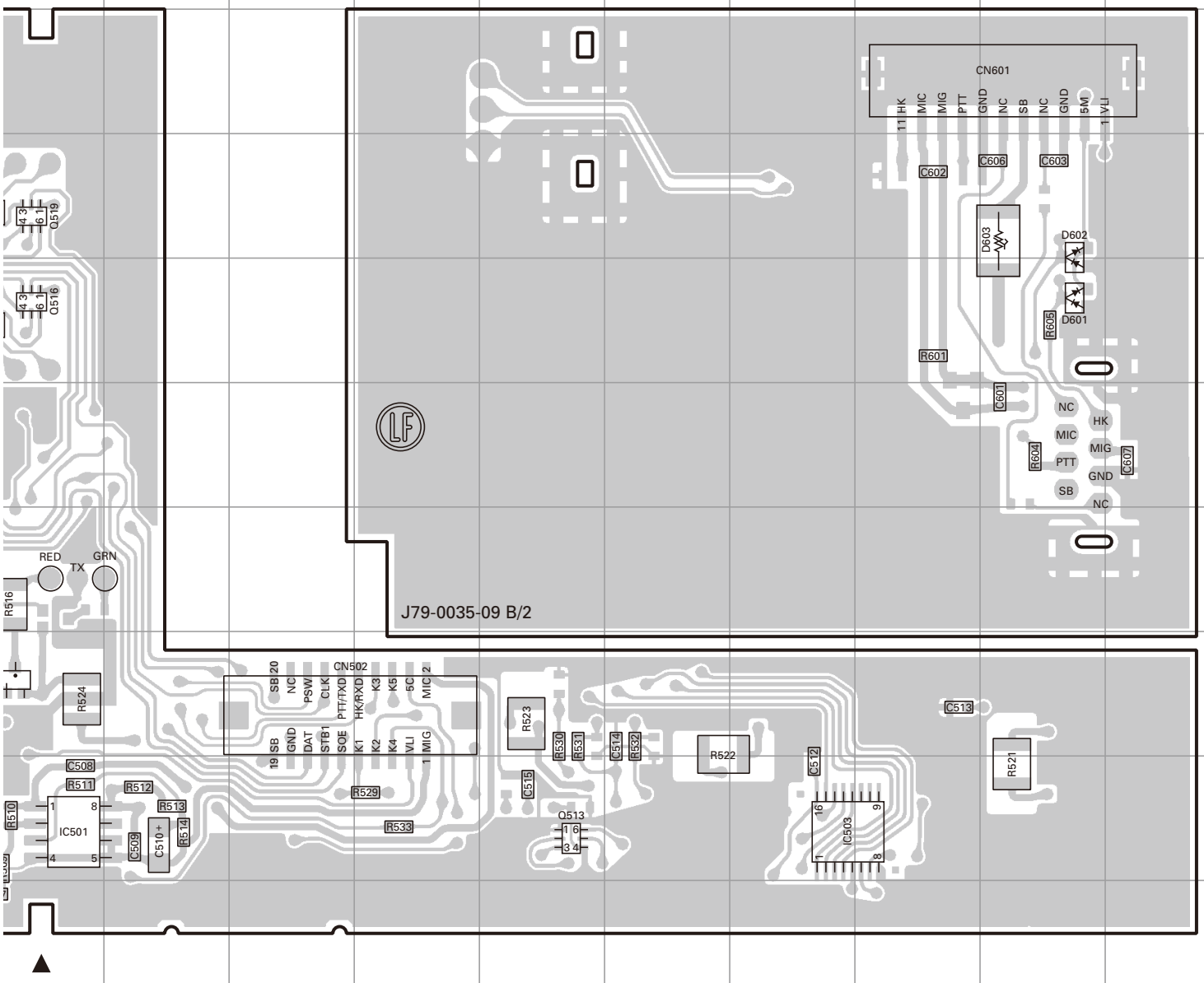
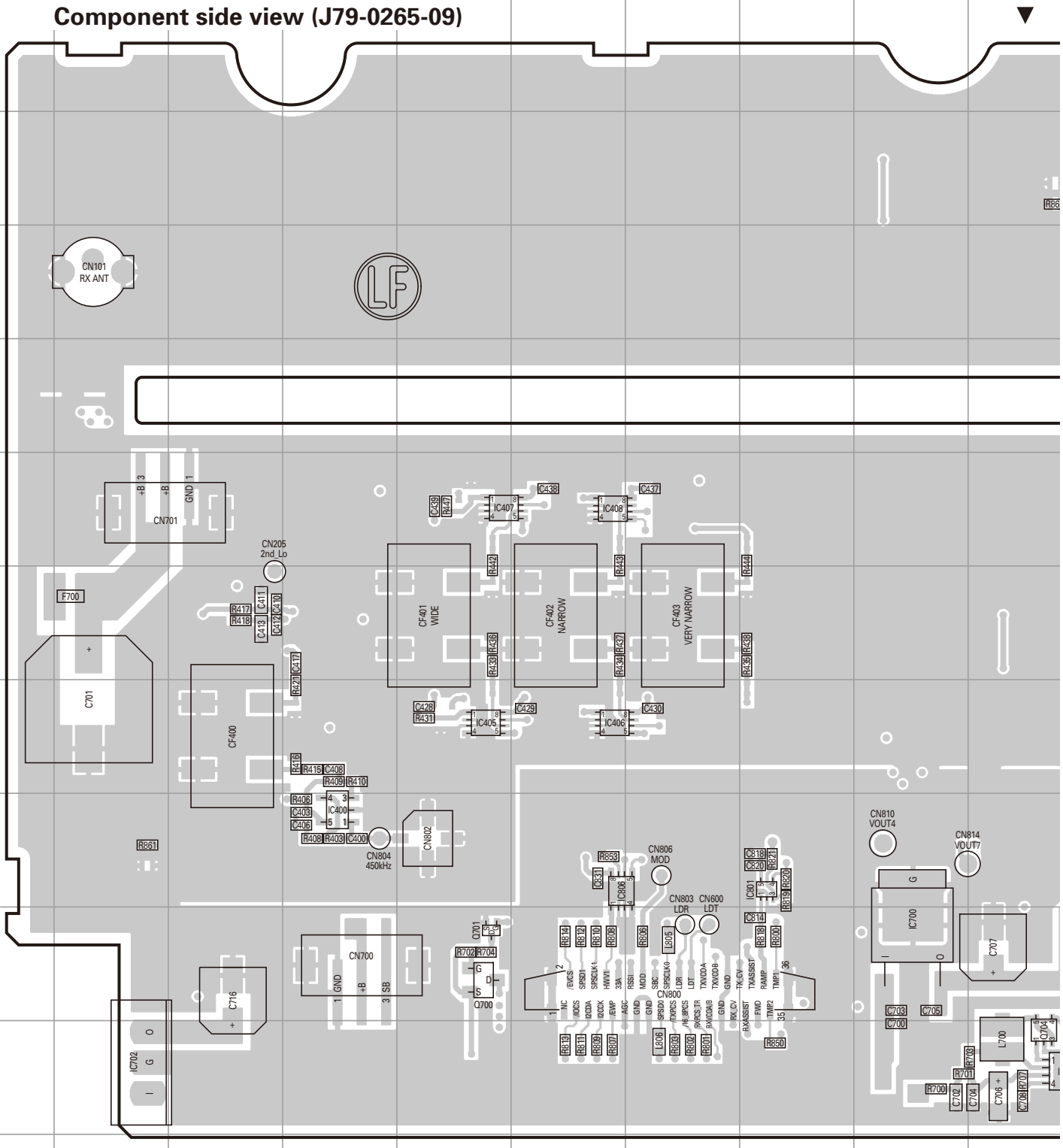
# PC BOARD NXR-710

## DISPLAY UNIT (X54-3580-20) Foil side view (J79-0035-09)



# NXR-710 PC BOARD

## TX-RX UNIT (X57-7940-10)
## 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 | | |



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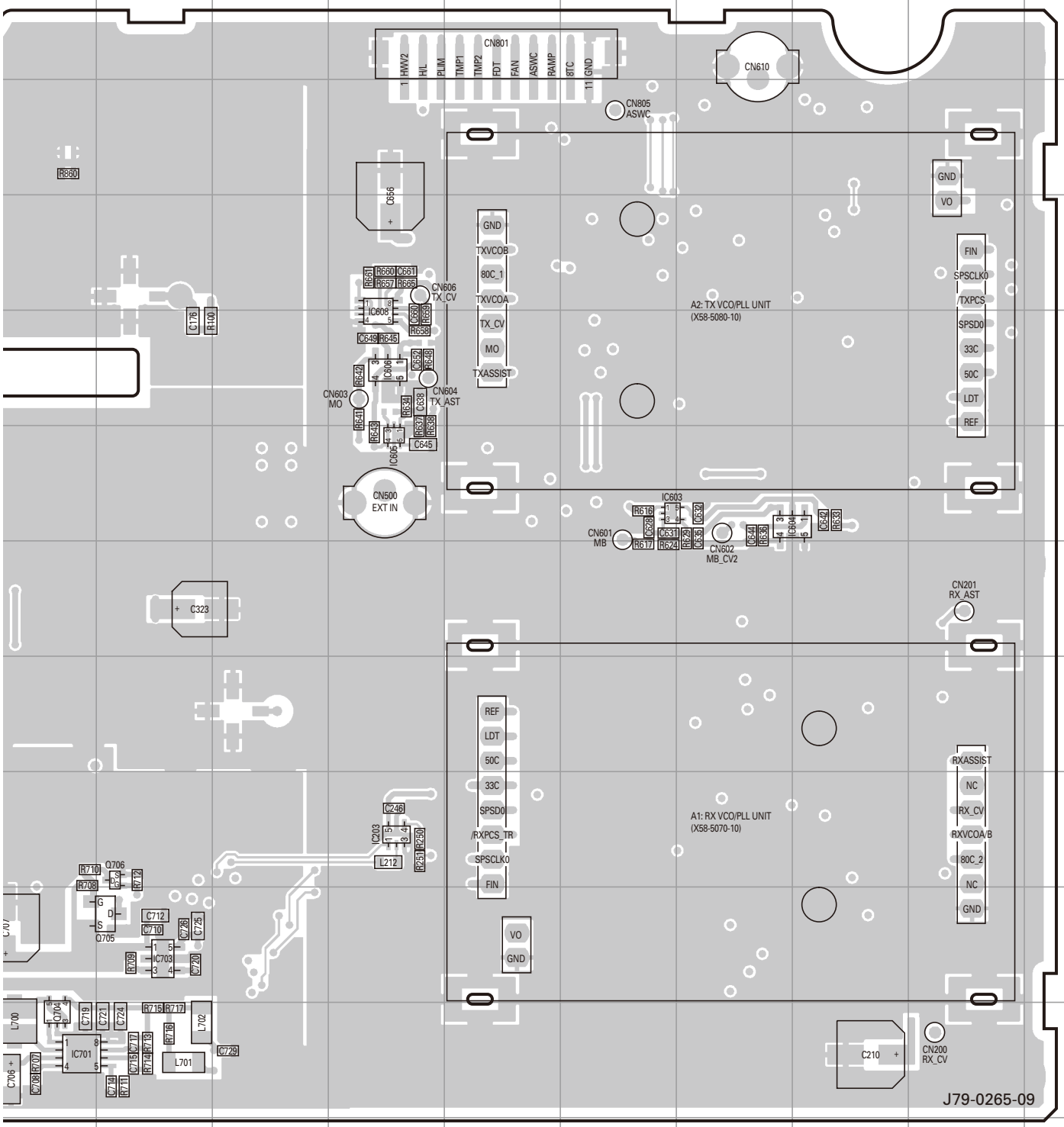
# PC BOARD NXR-710

## TX-RX UNIT (X57-7940-10)
## Component side view (J79-0265-09)




Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side



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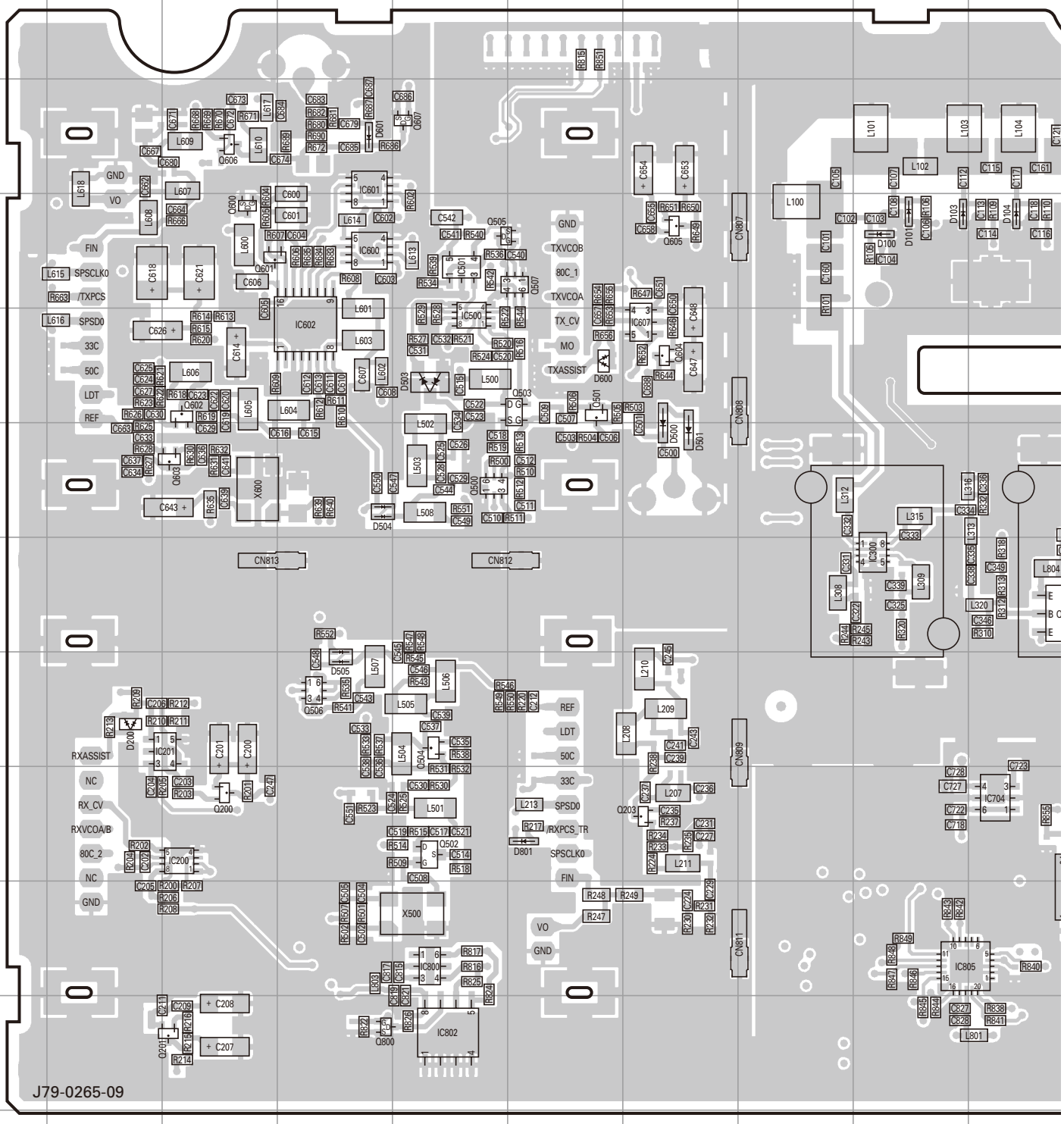
# NXR-710 PC BOARD

## TX-RX UNIT (X57-7940-10)
## Foil side view (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. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |



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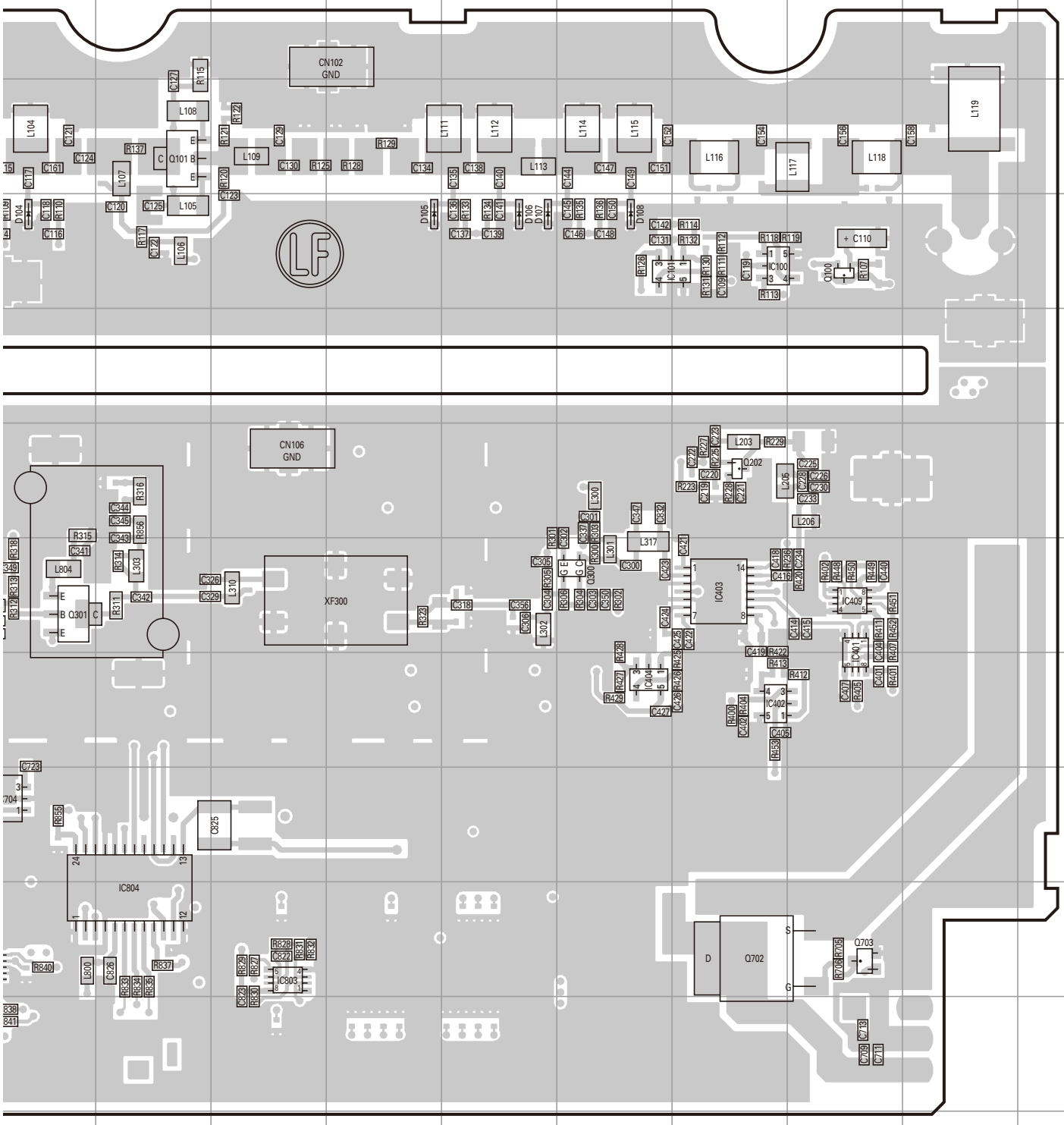
# PC BOARD NXR-710

## TX-RX UNIT (X57-7940-10)
## Foil side view (J79-0265-09)




| Ref. No. | Address | Ref. No. | Address | Ref. No. | Address | Ref. No. | Address |
|---|---|---|---|---|---|---|---|
| Q604 | 5G | Q800 | 11D | D106 | 4N | D503 | 5E |
| Q605 | 4G | D100 | 4I | D107 | 4N | D504 | 6D |
| Q606 | 3C | D101 | 4I | D108 | 4O | D505 | 8D |
| Q607 | 3E | D103 | 4I | D200 | 8B | D600 | 5F |
| Q702 | 10P | D104 | 4J | D500 | 6G | D601 | 3D |
| Q703 | 10Q | D105 | 4M | D501 | 6G | D801 | 9F |

Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side



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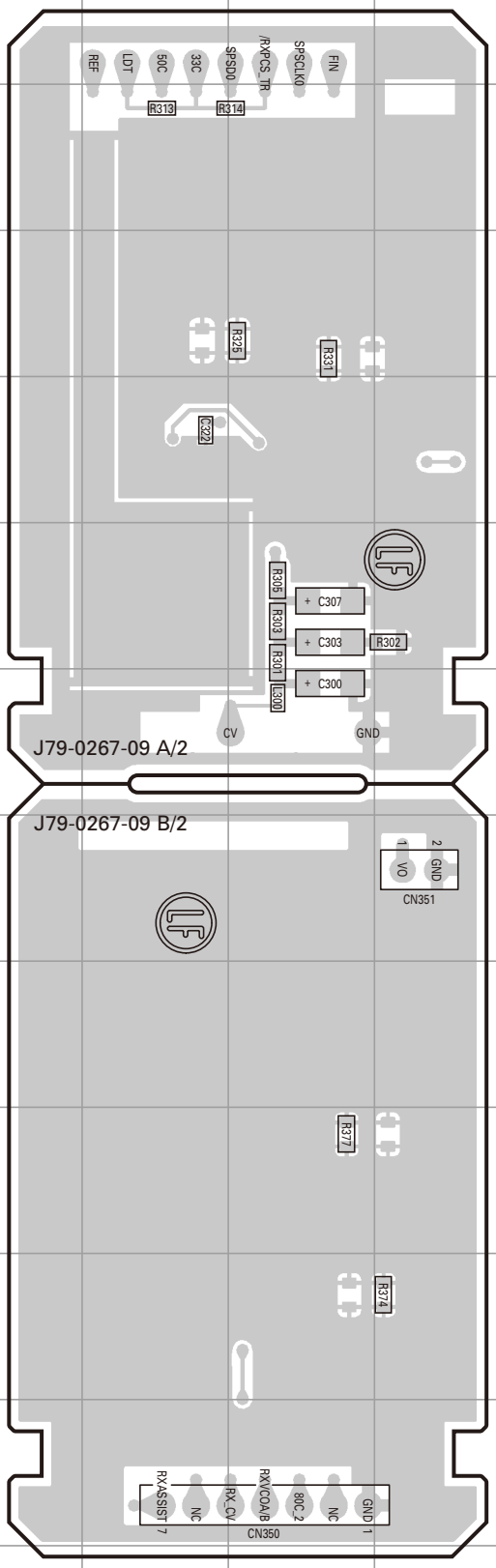
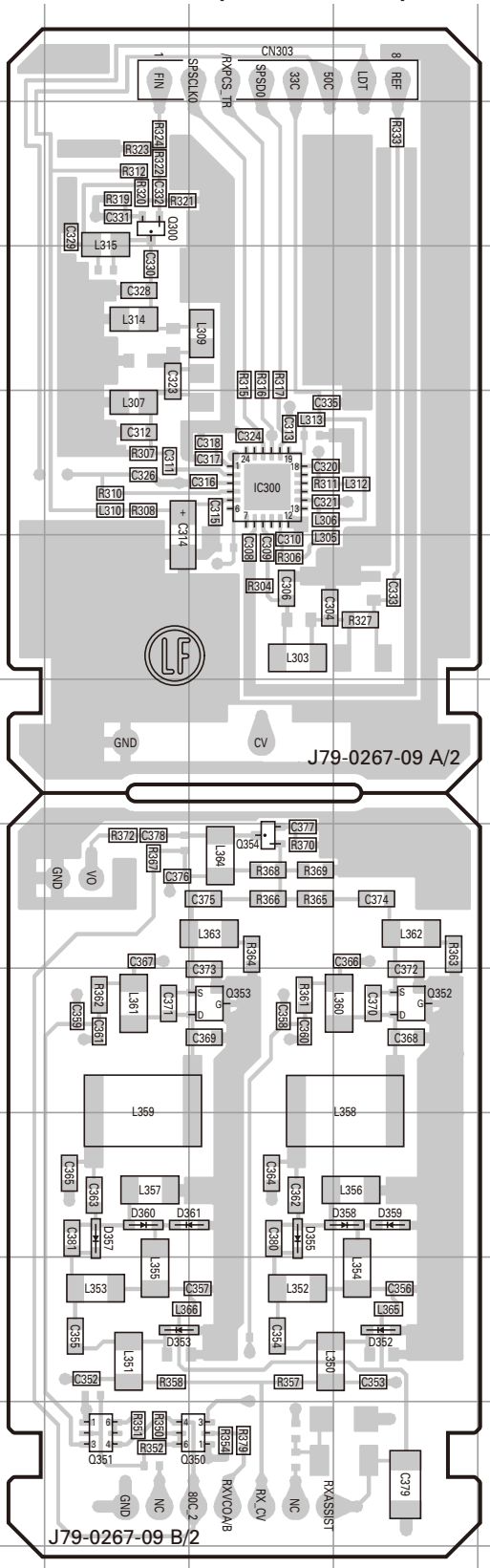
# NXR-710 PC BOARD

## 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 |

Component side
Layer 1
Layer 2
Foil side

Component side
Layer 1
Layer 2
Foil side



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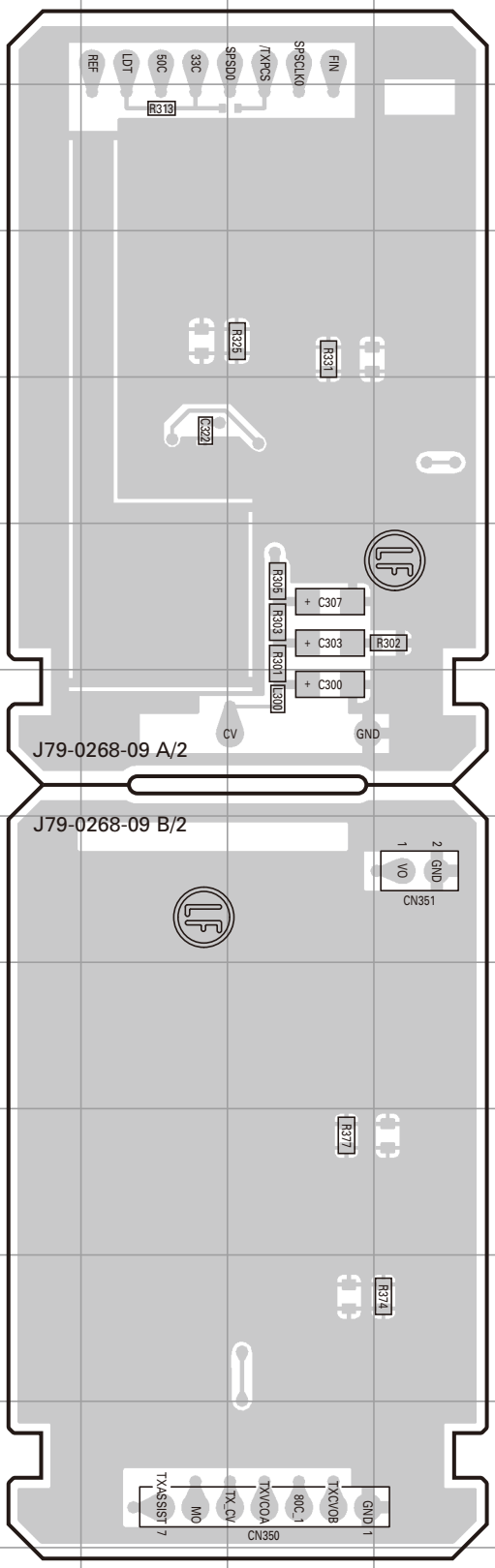
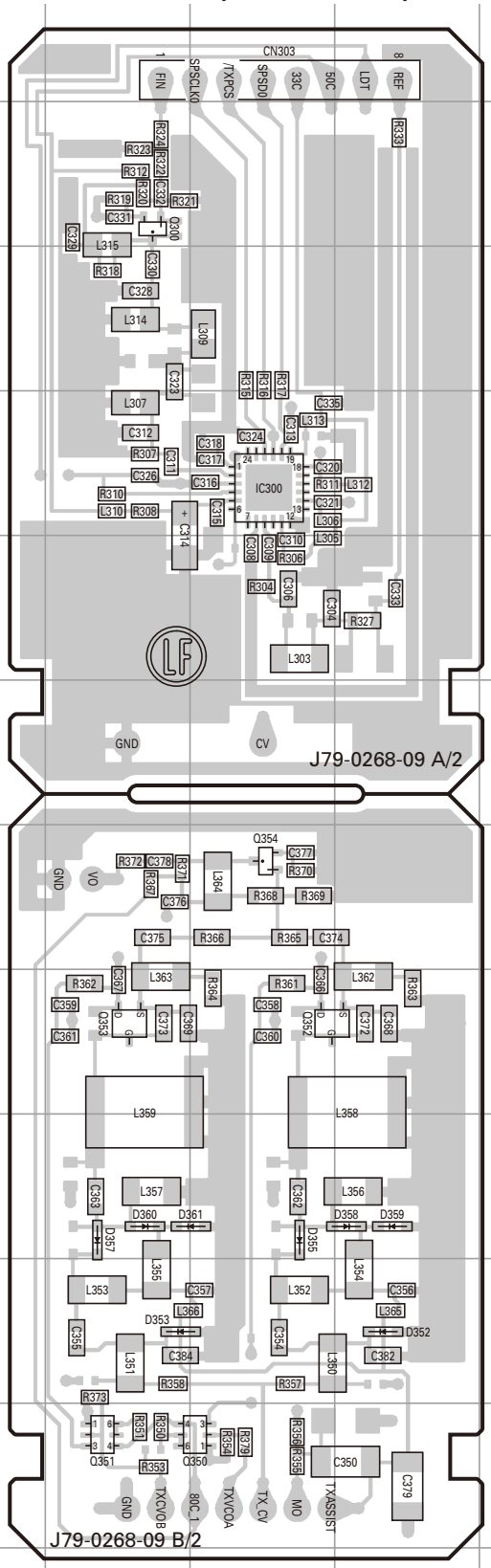
## TX VCO/PLL UNIT (X58-5080-10)
### Component side view (J79-0268-09)




## 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 |

Component side
Layer 1
Layer 2
Foil side

Component side
Layer 1
Layer 2
Foil side



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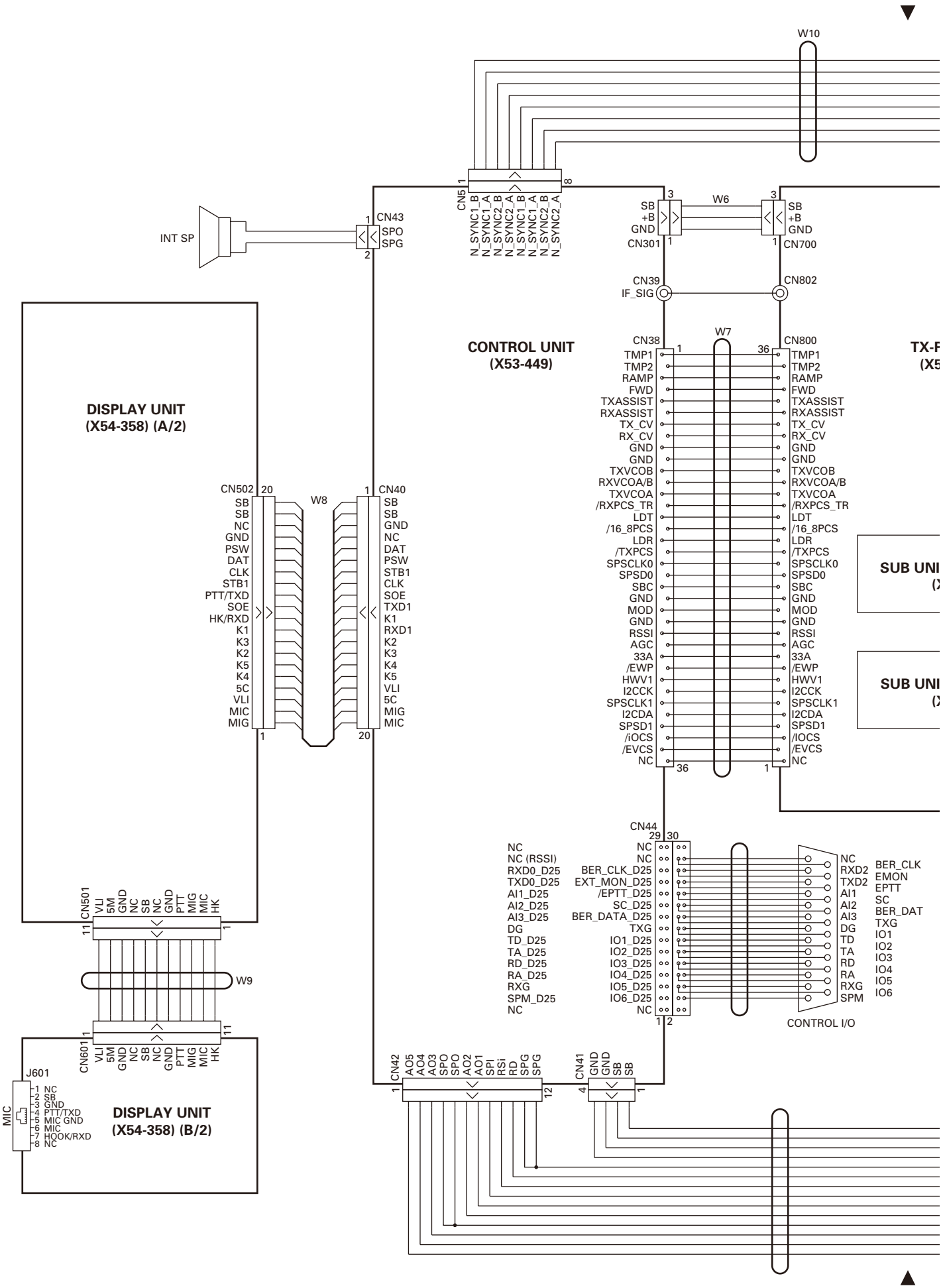




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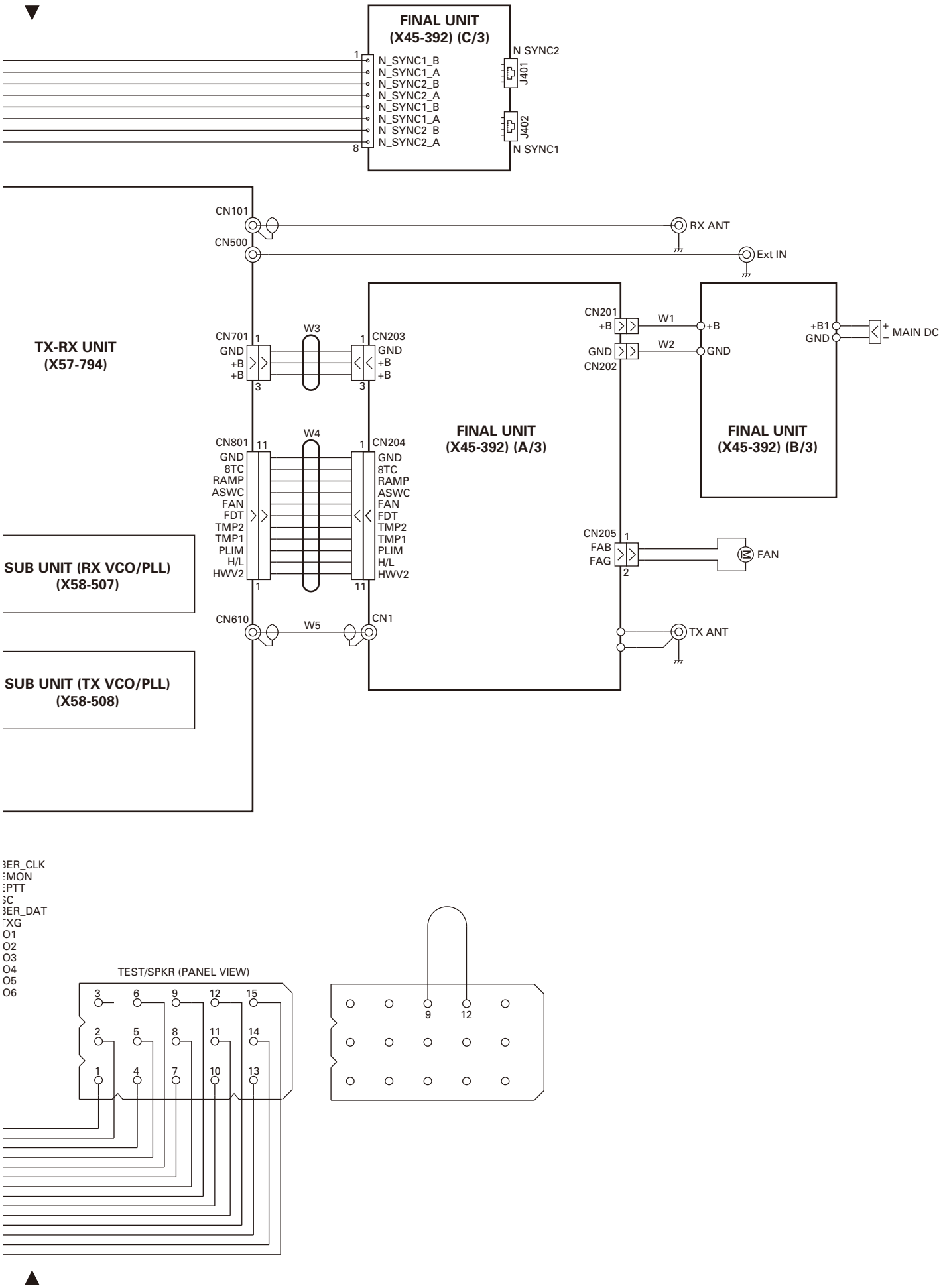




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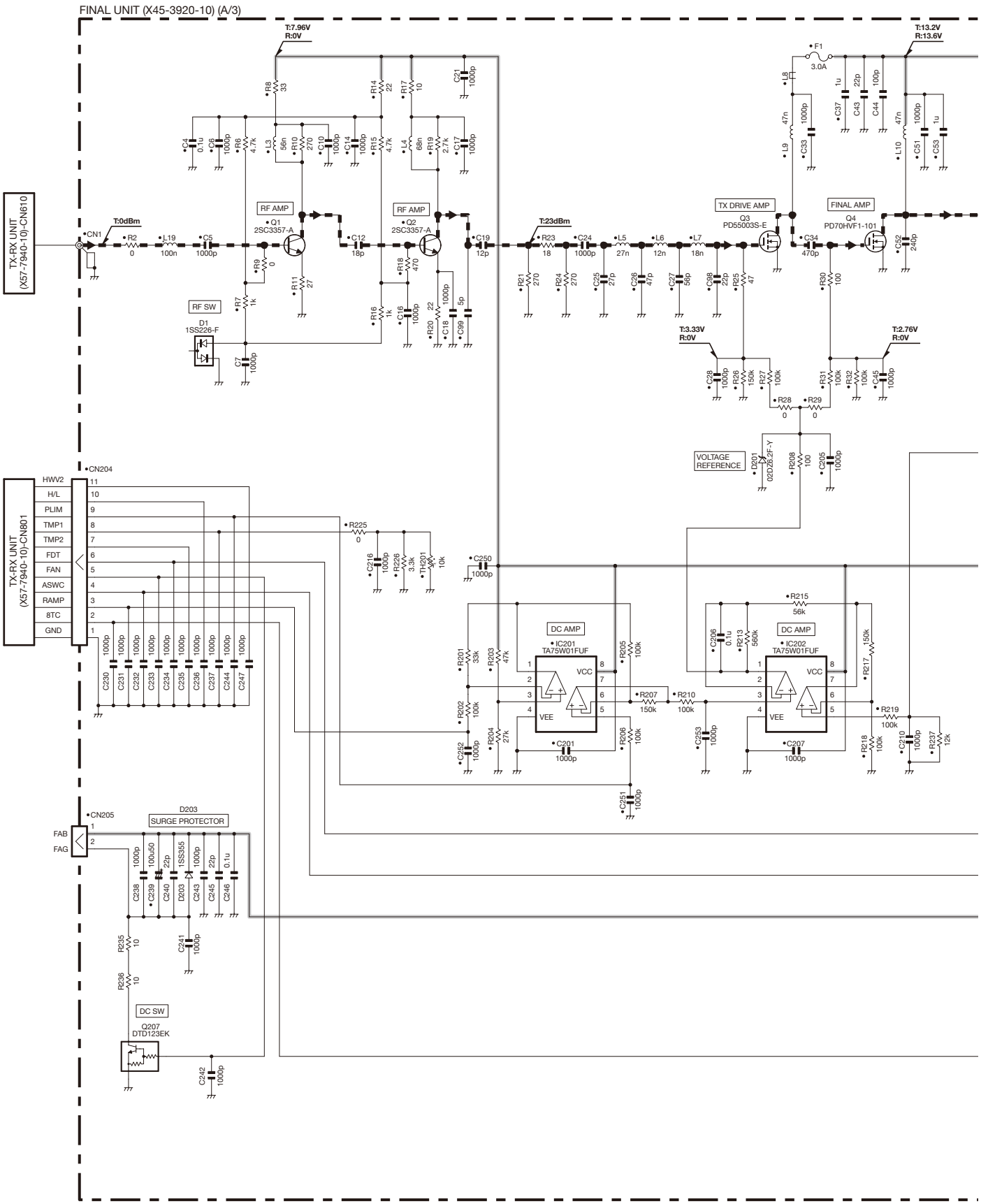
# NXR-710 SCHEMATIC DIAGRAM







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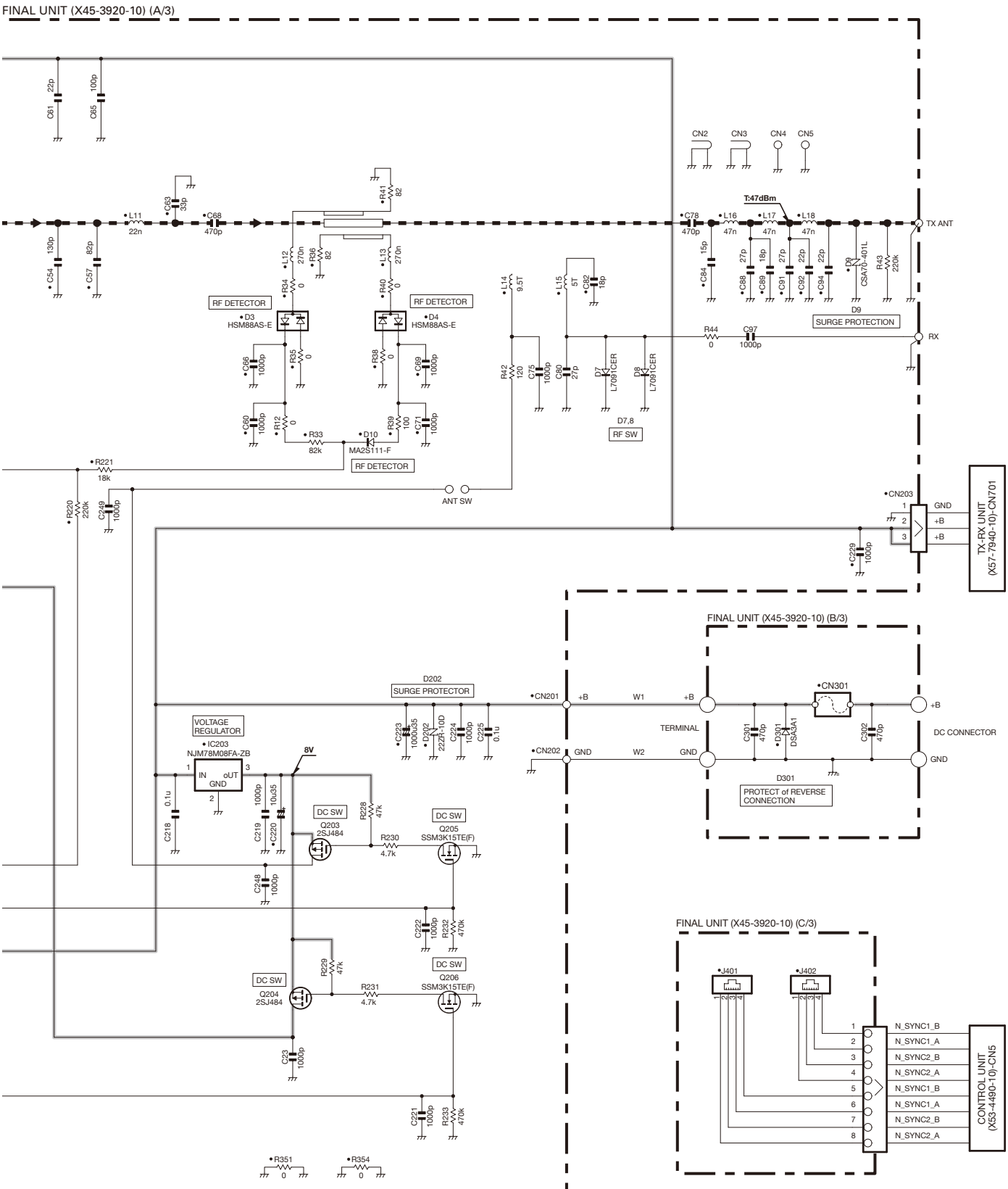
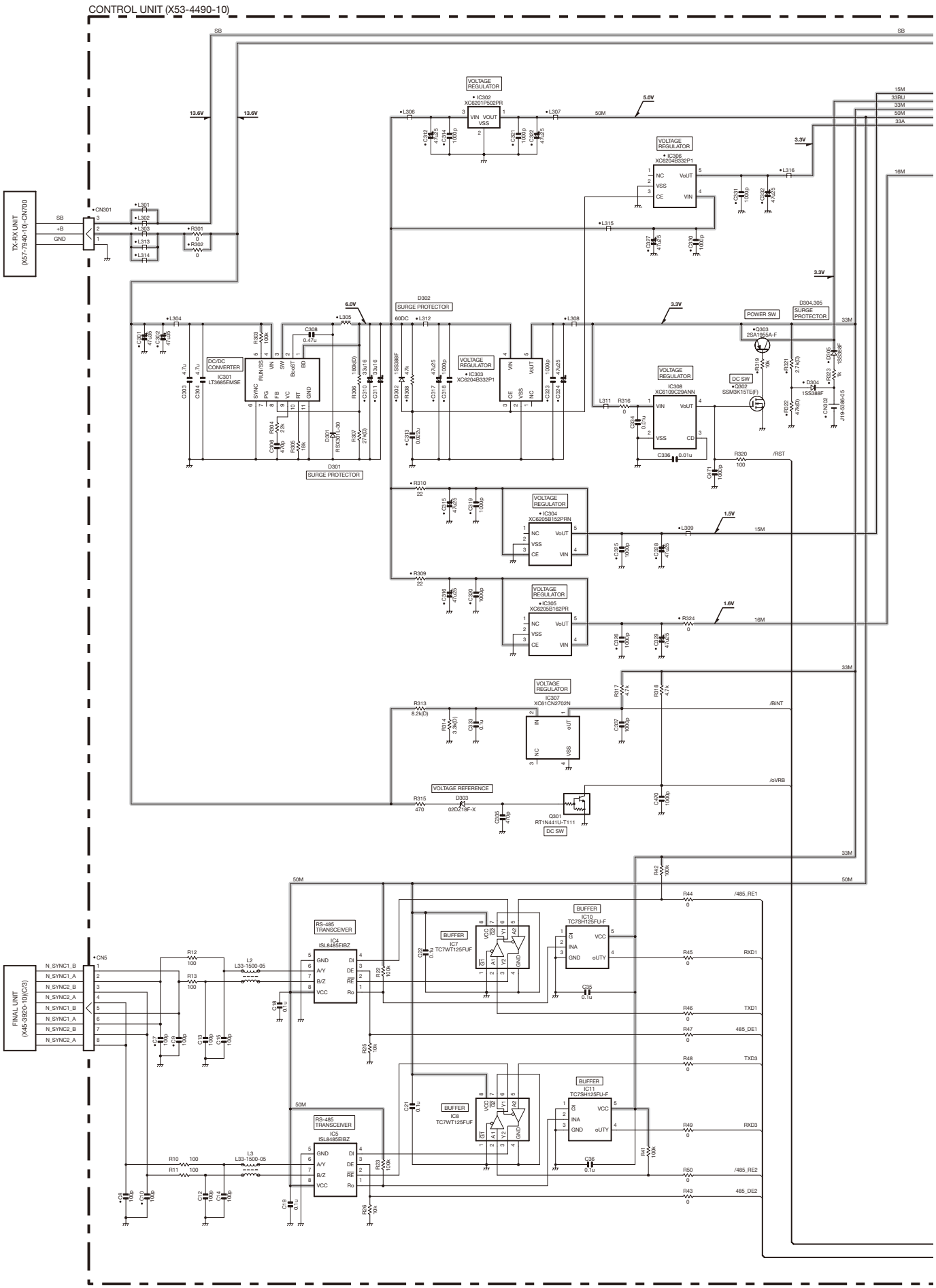
# SCHEMATIC DIAGRAM NXR-710




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

# NXR-710 SCHEMATIC DIAGRAM







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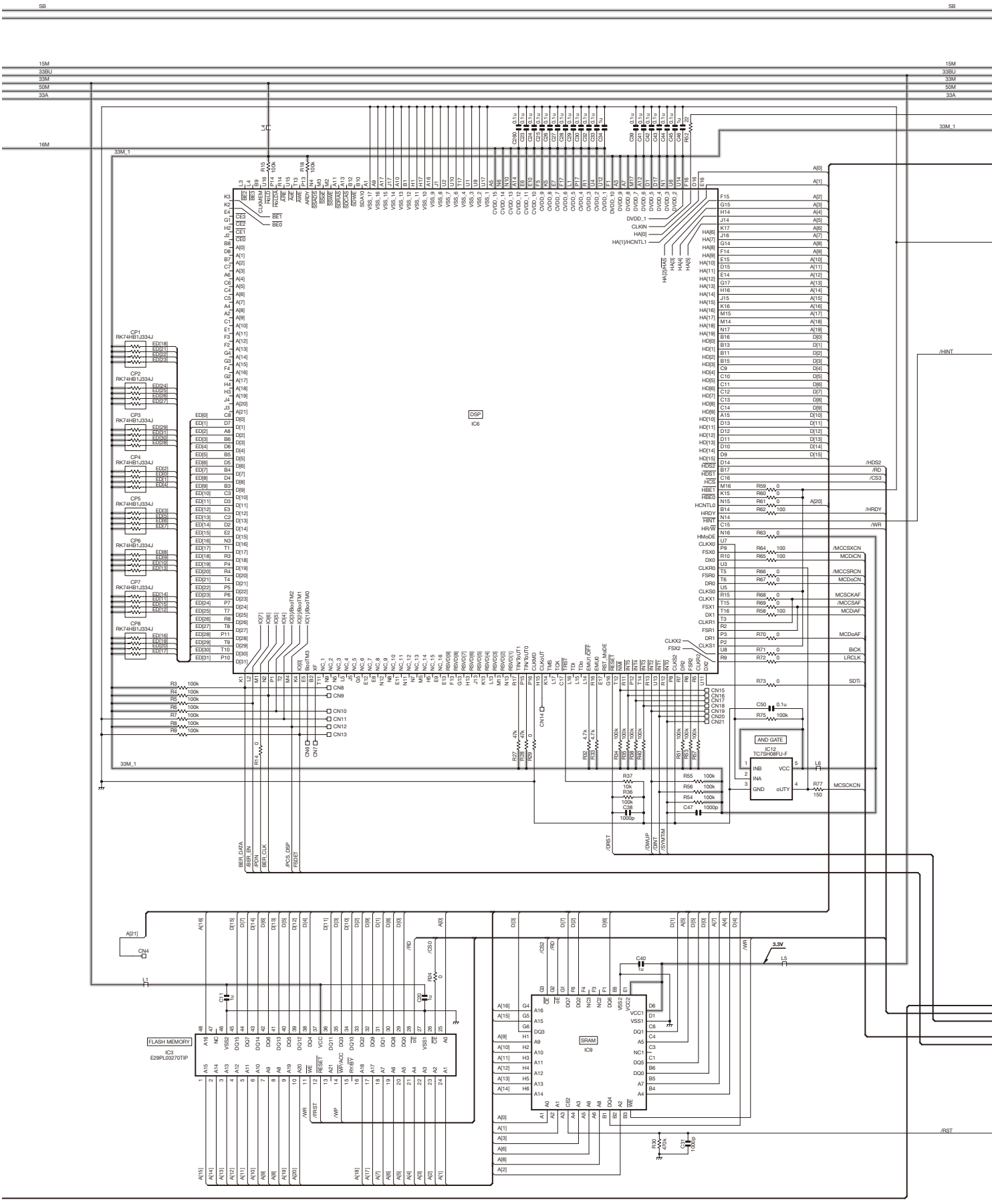
# SCHEMATIC DIAGRAM NXR-710

CONTROL UNIT (X53-4490-10)



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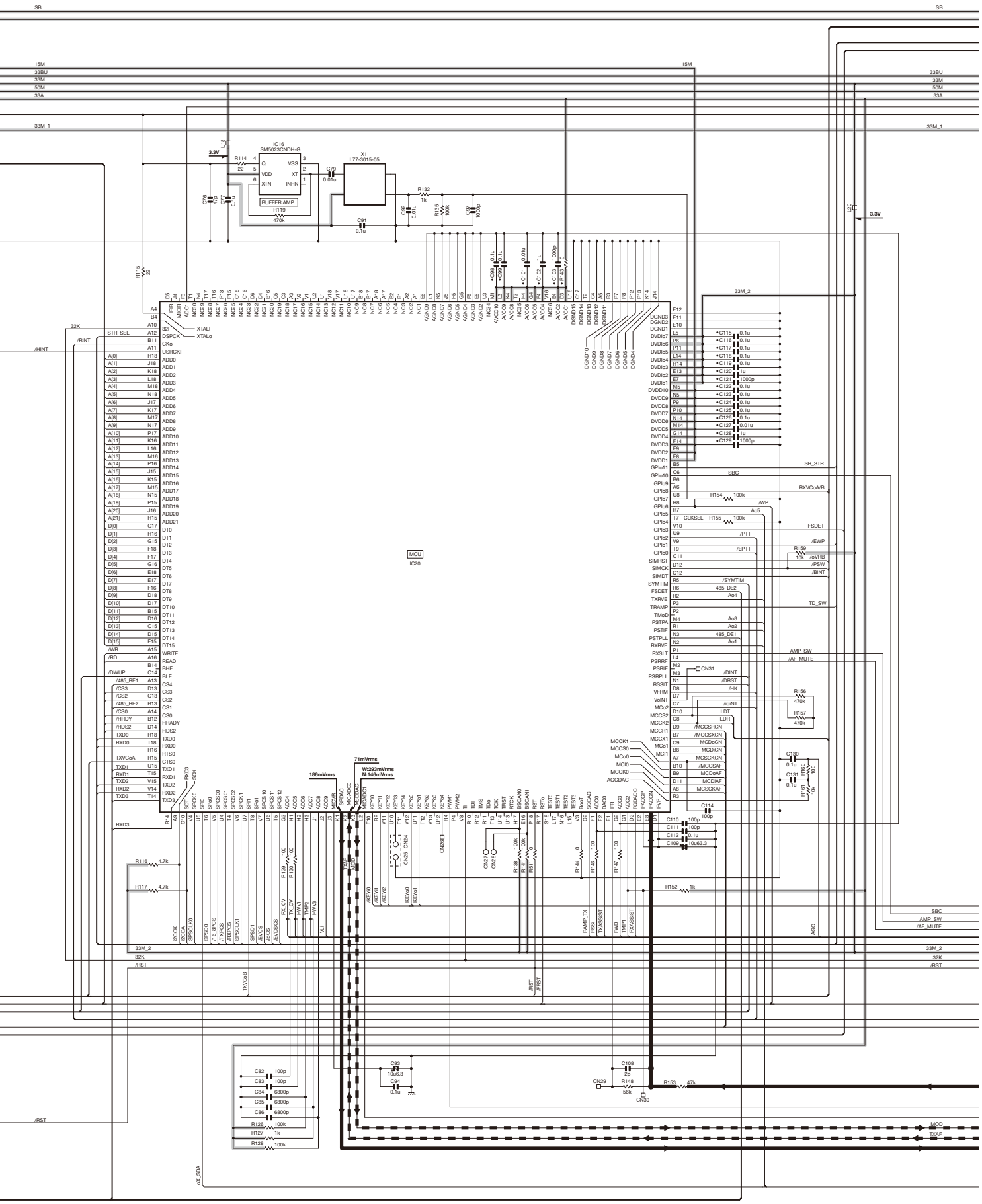
# NXR-710 SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4490-10)



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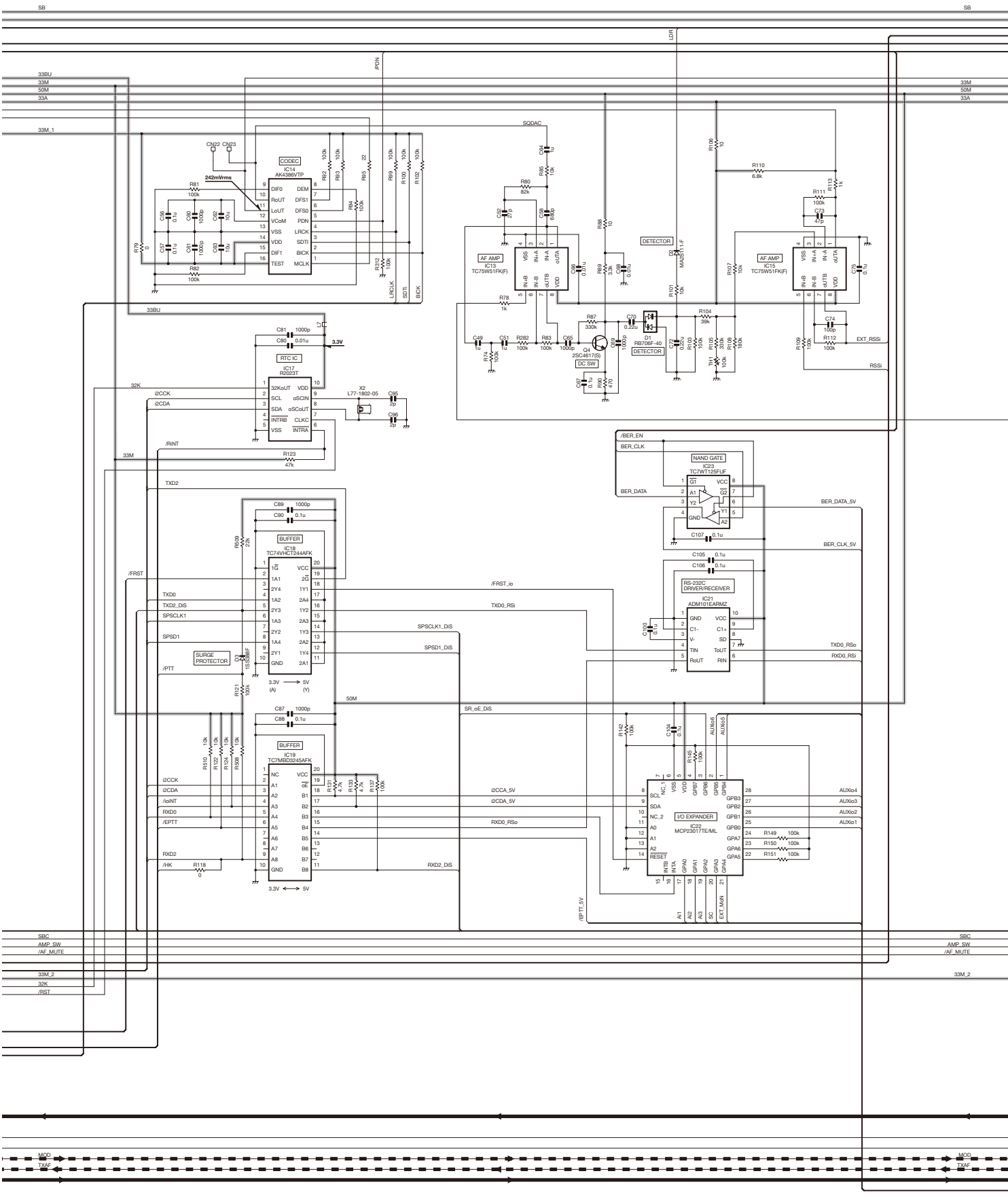
# SCHEMATIC DIAGRAM NXR-710

CONTROL UNIT (X53-4490-10)



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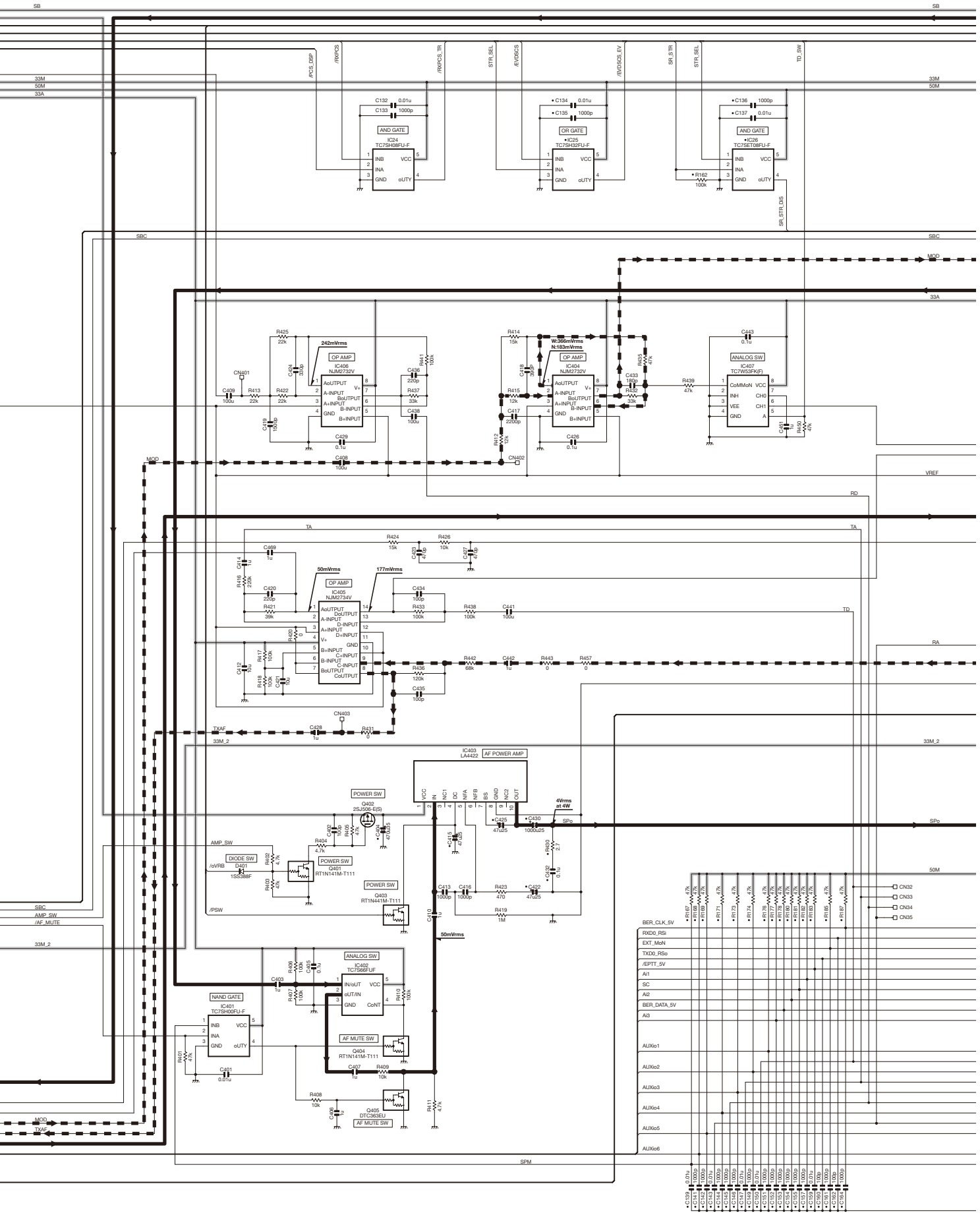
# NXR-710 SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4490-10)



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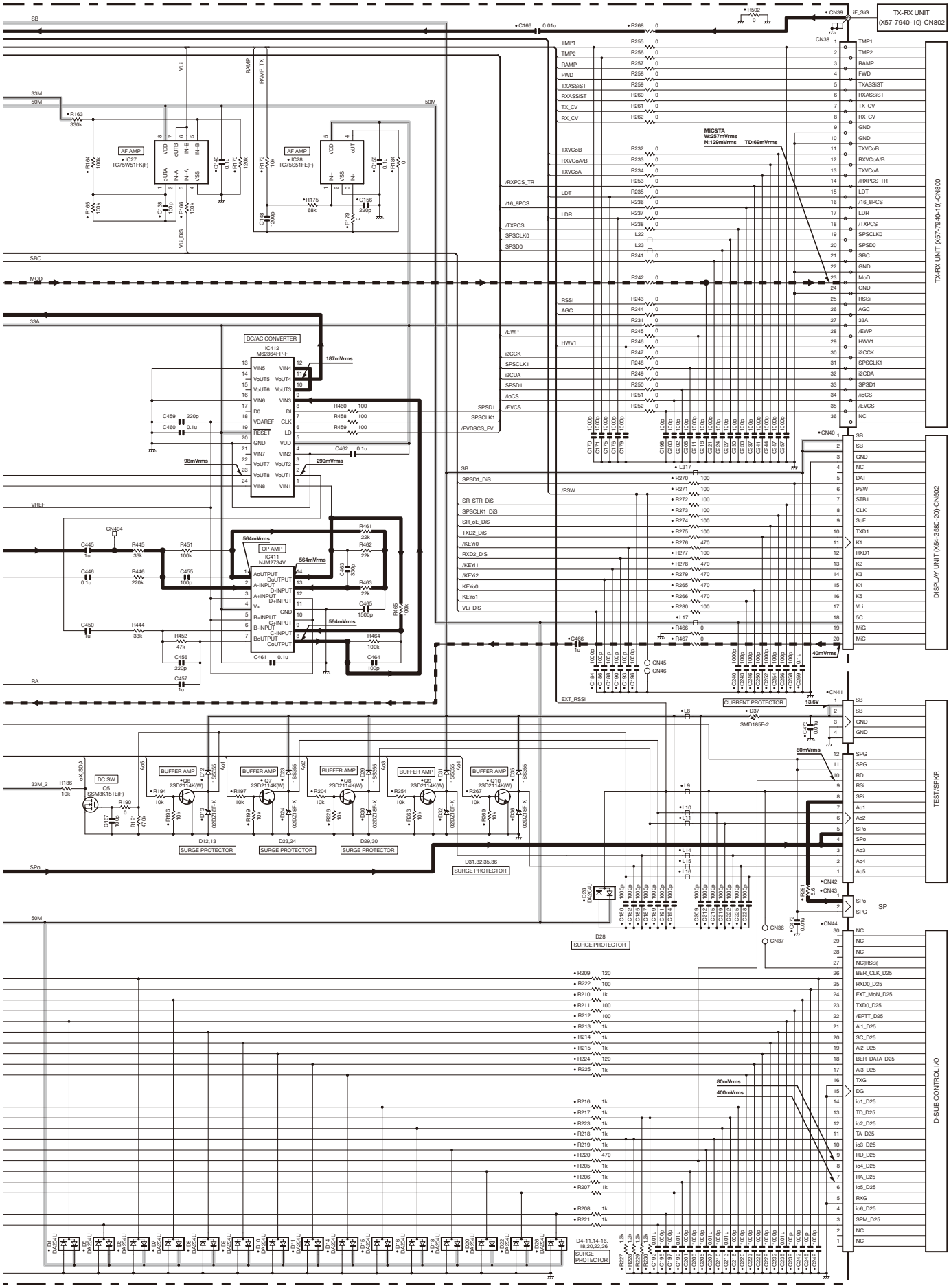
# SCHEMATIC DIAGRAM NXR-710

CONTROL UNIT (X53-4490-10)




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



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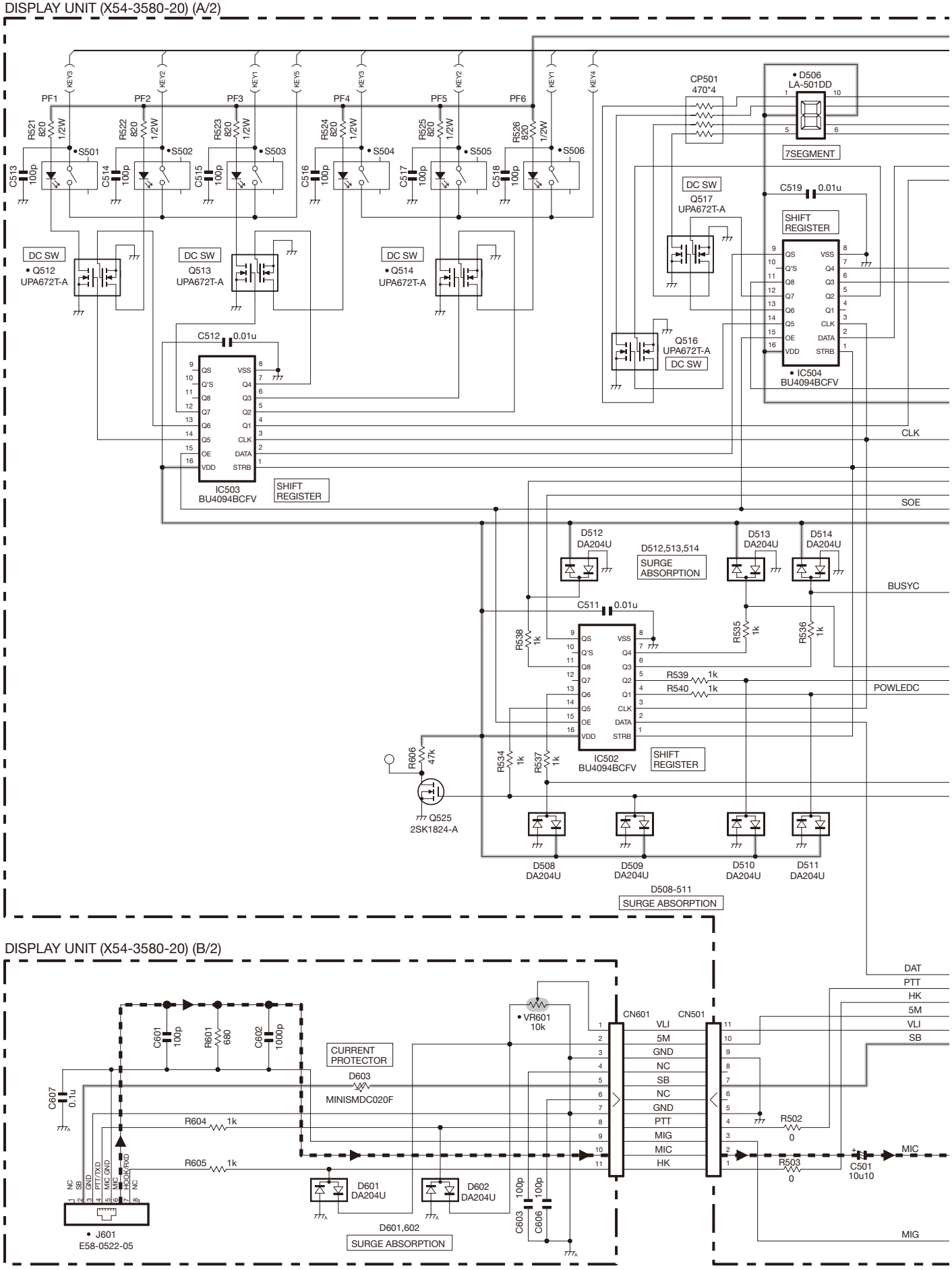
# NXR-710 SCHEMATIC DIAGRAM







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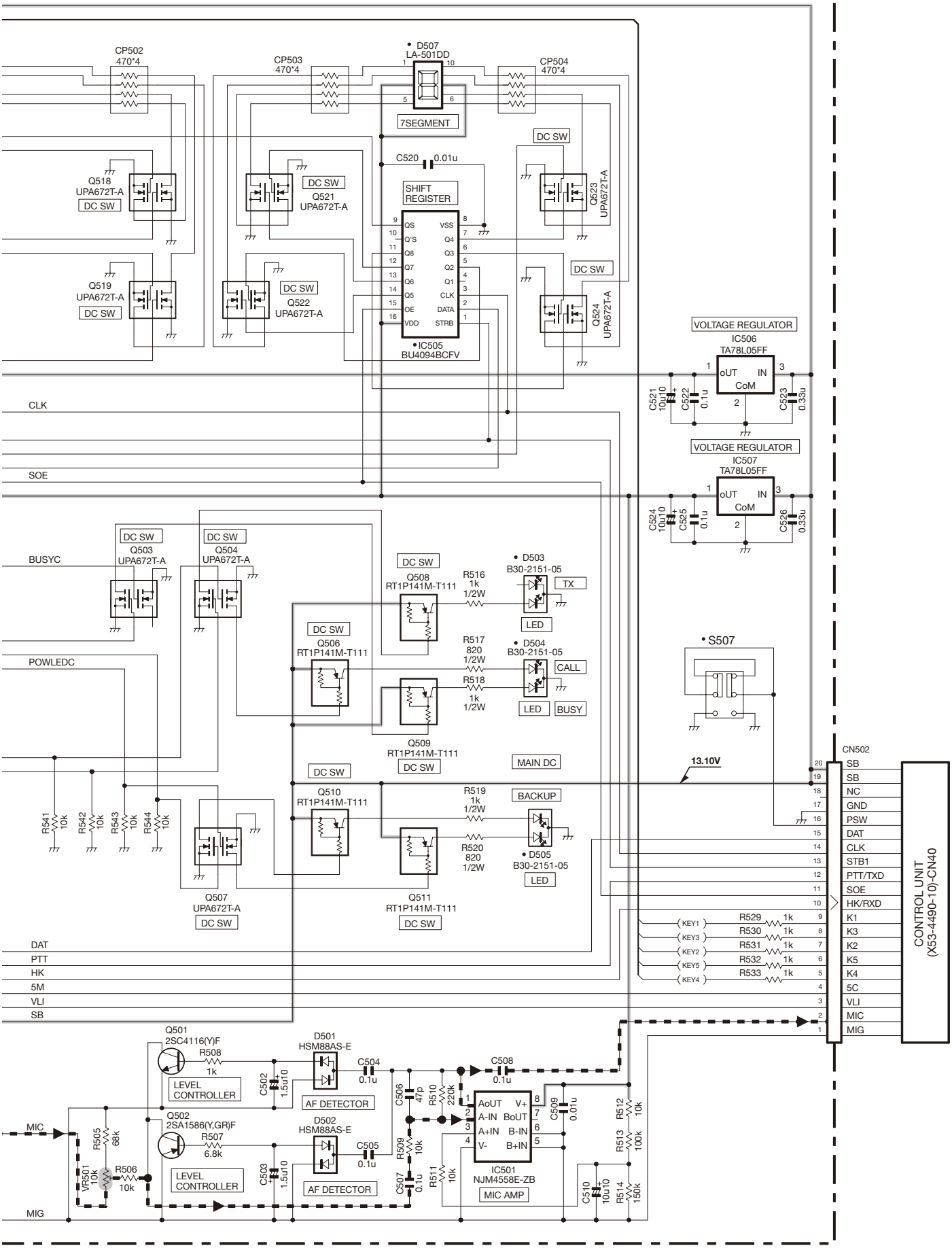
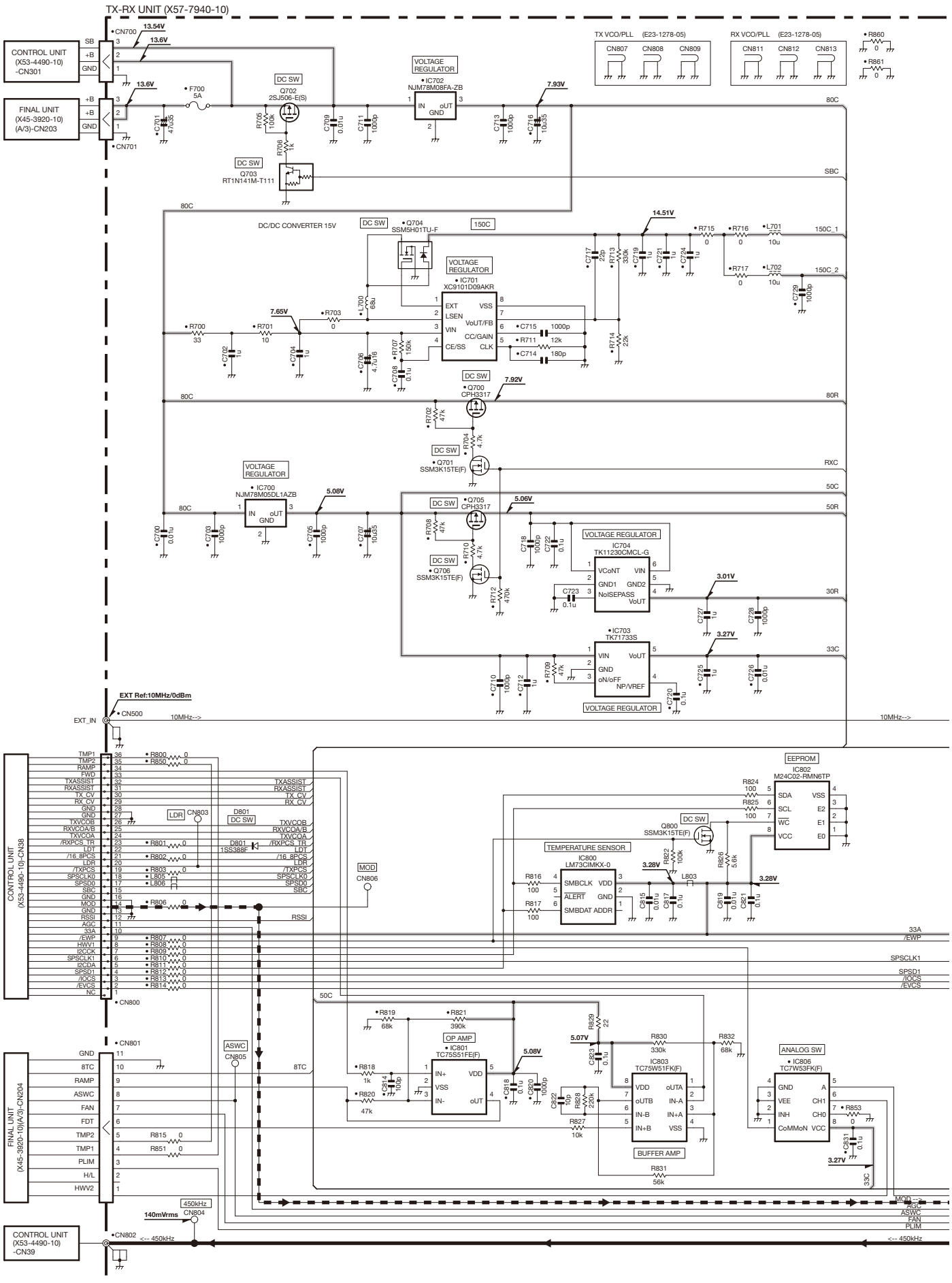
# SCHEMATIC DIAGRAM NXR-710

DISPLAY UNIT (X54-3580-20) (A/2)




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

# NXR-710 SCHEMATIC DIAGRAM







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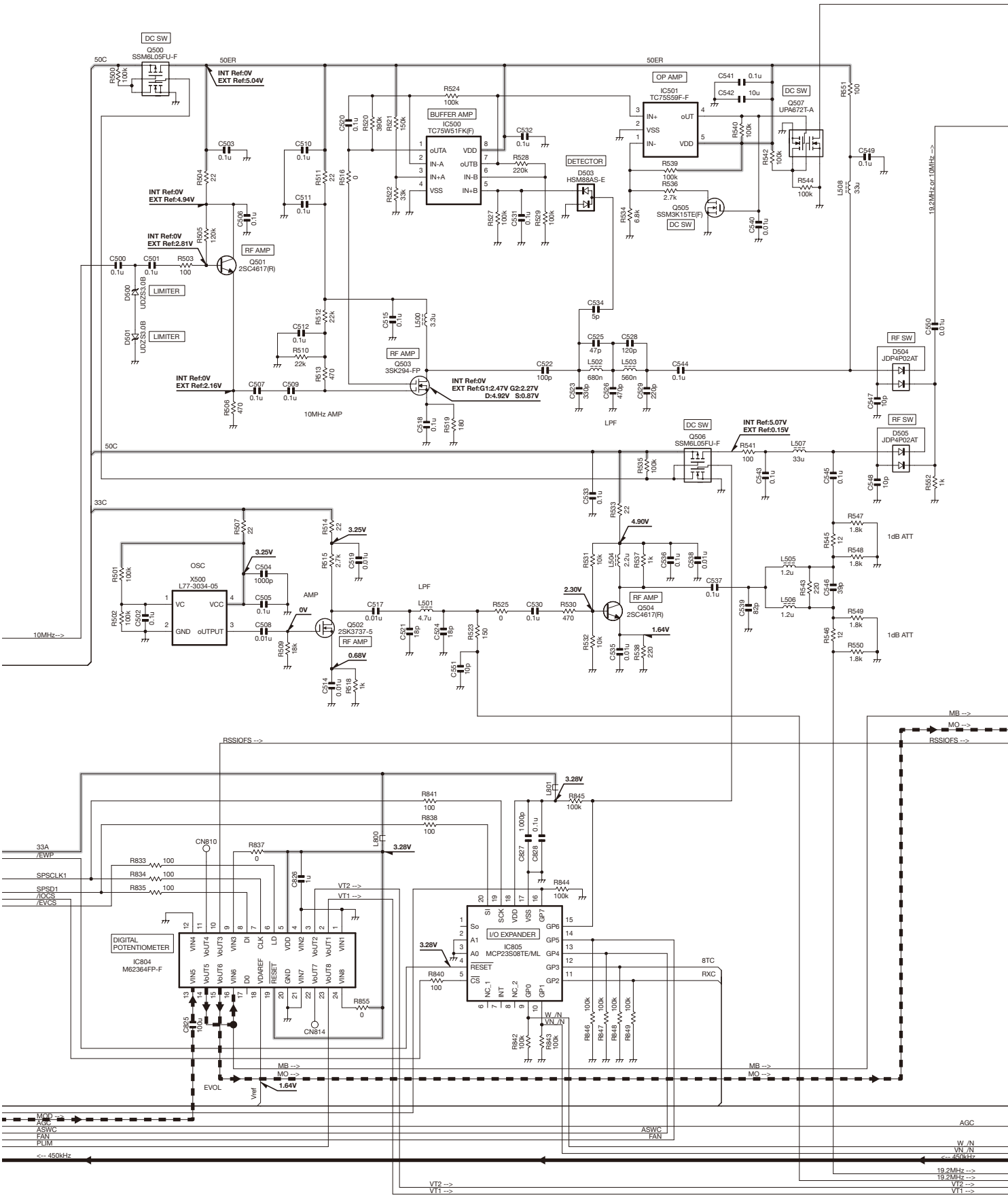
# SCHEMATIC DIAGRAM NXR-710

TX-RX UNIT (X57-7940-10)



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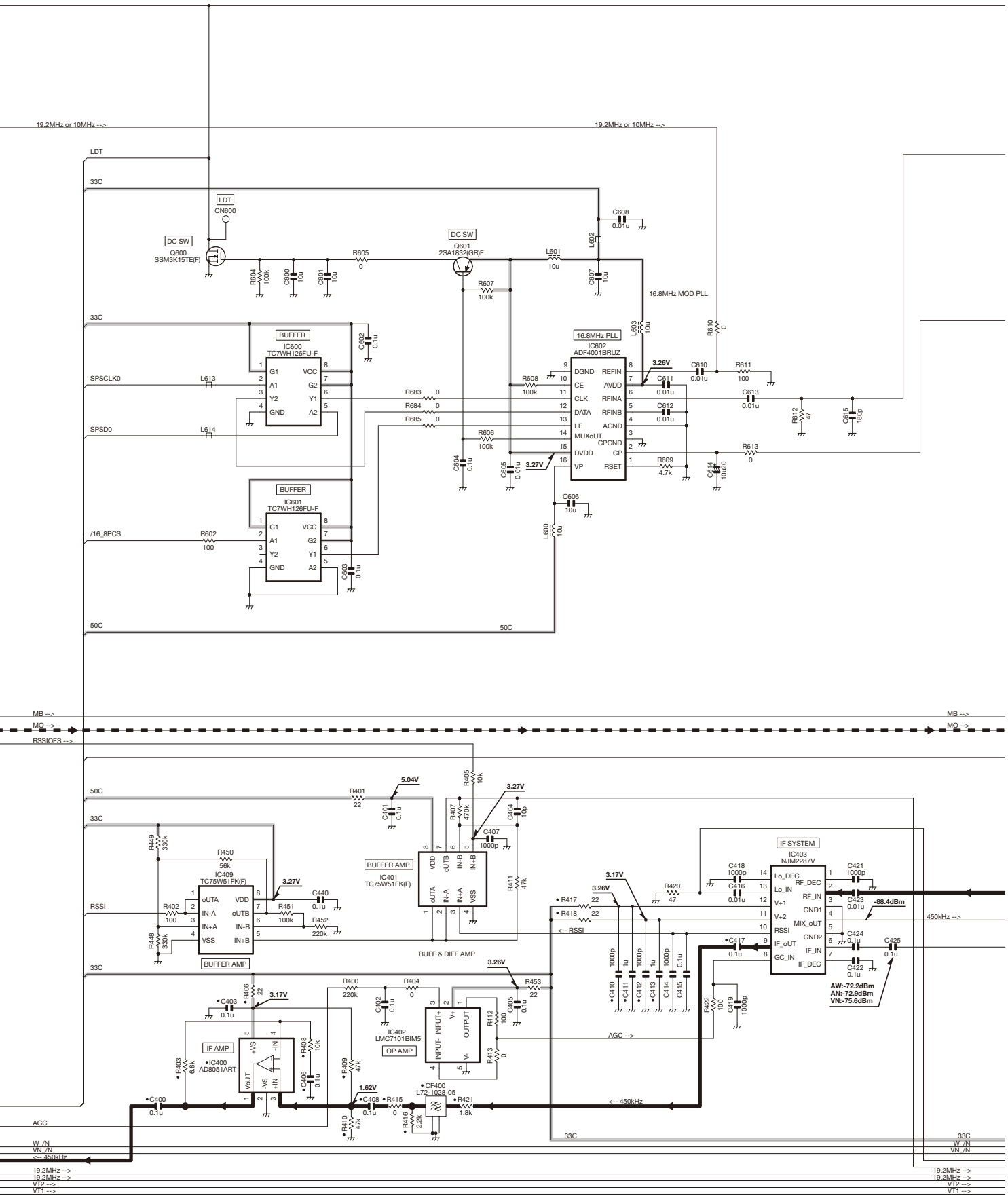
# NXR-710 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7940-10)



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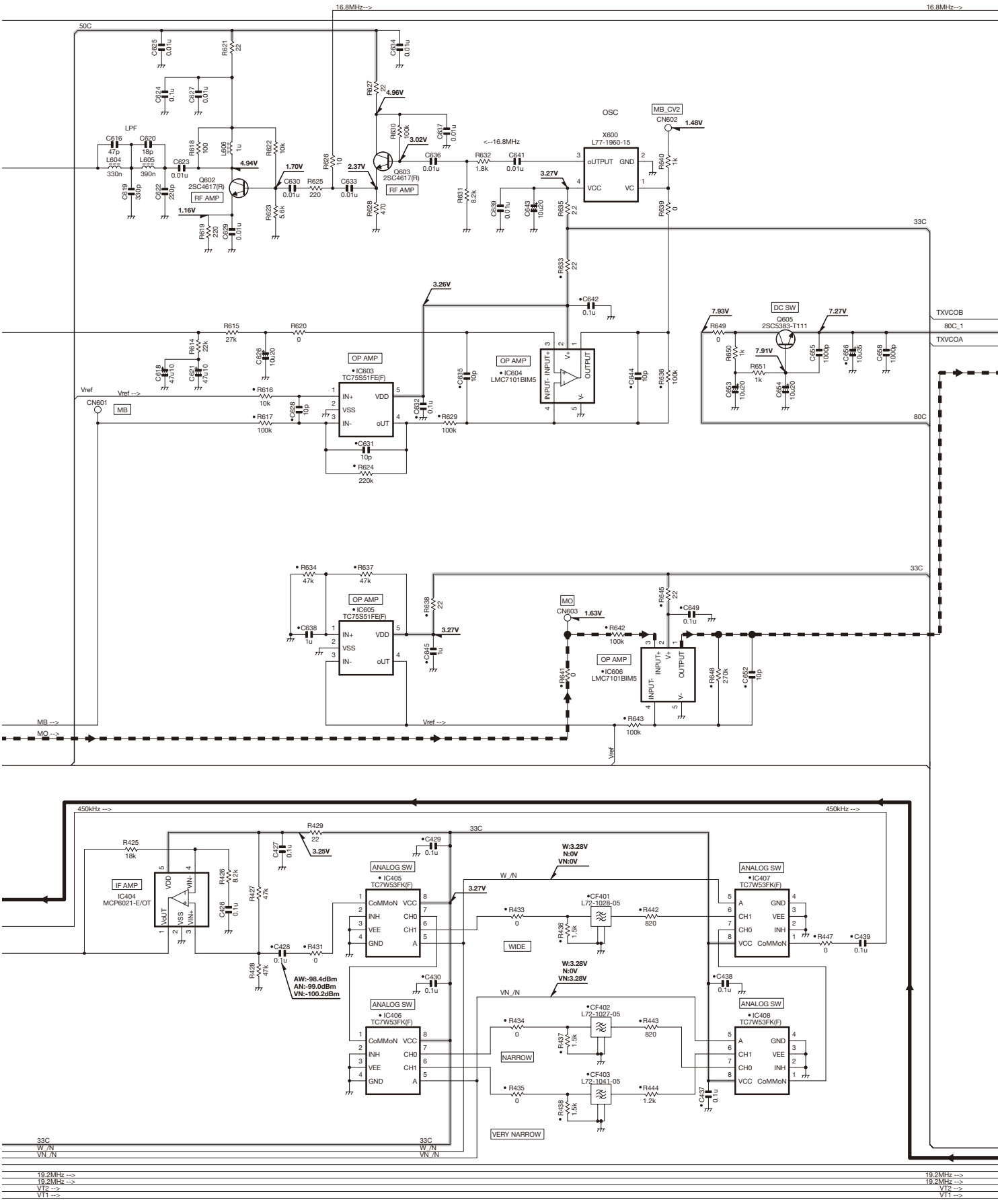
# SCHEMATIC DIAGRAM NXR-710

TX-RX UNIT (X57-7940-10)



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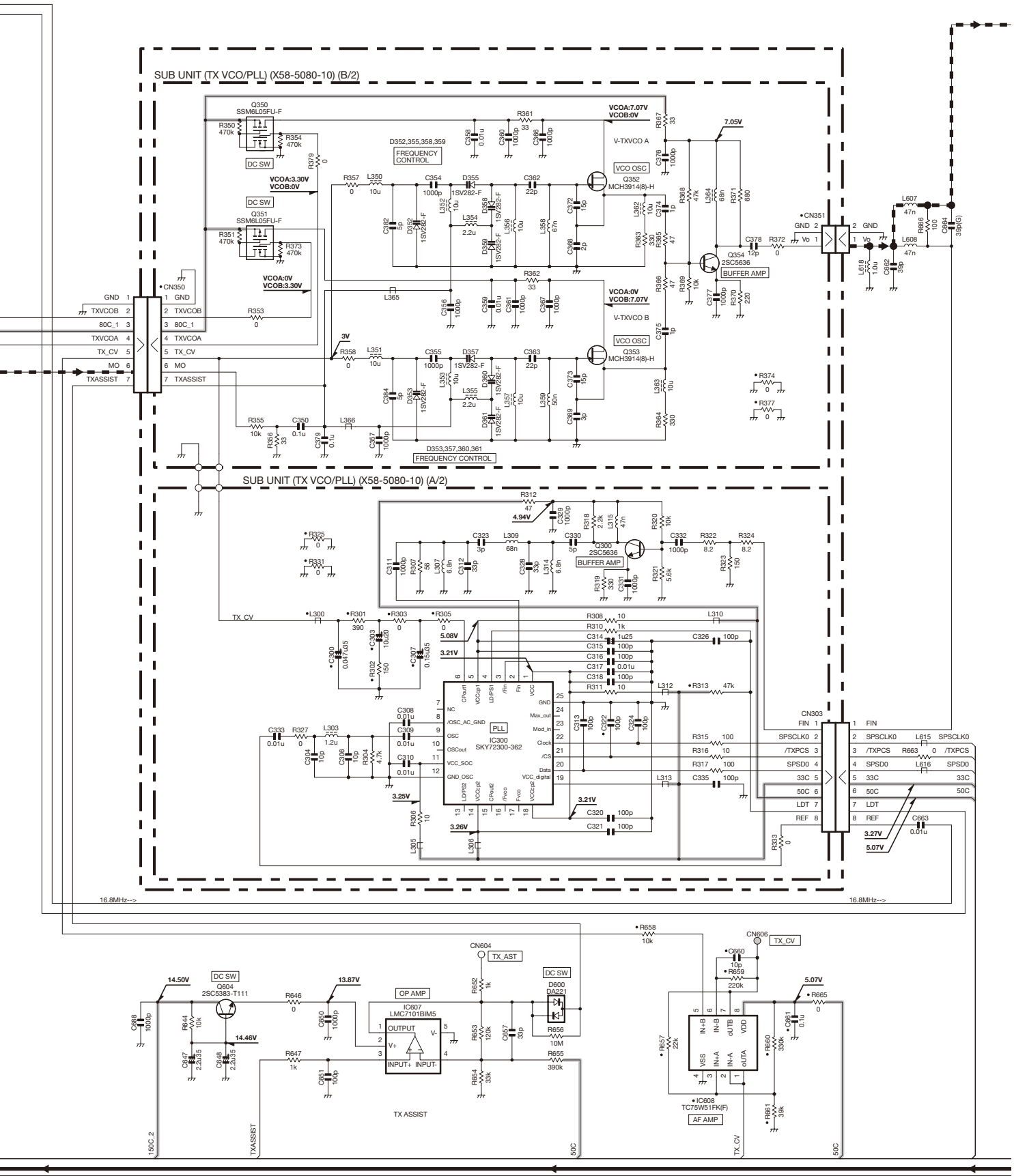
# NXR-710 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7940-10)



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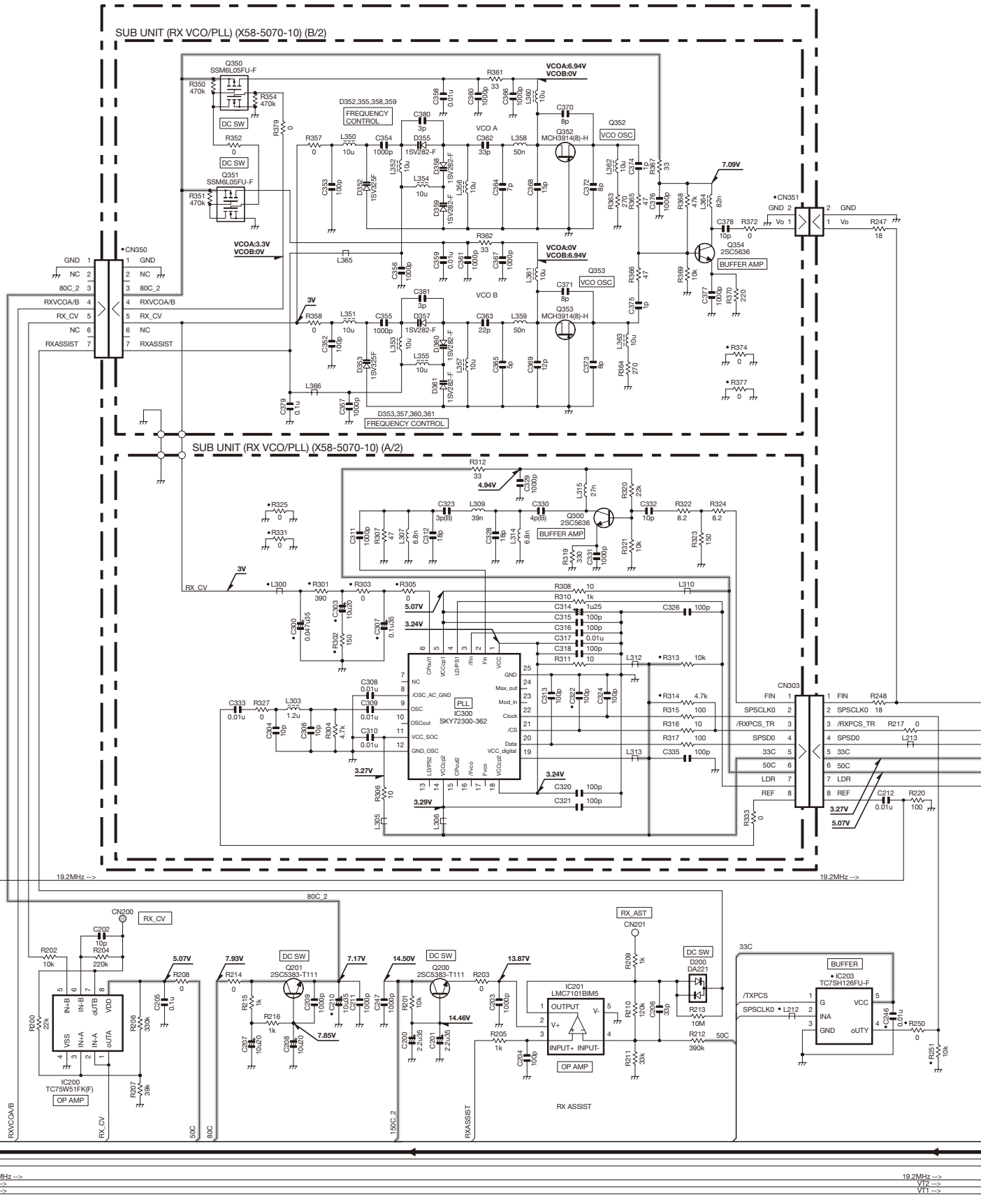
# SCHEMATIC DIAGRAM NXR-710

TX-RX UNIT (X57-7940-10)



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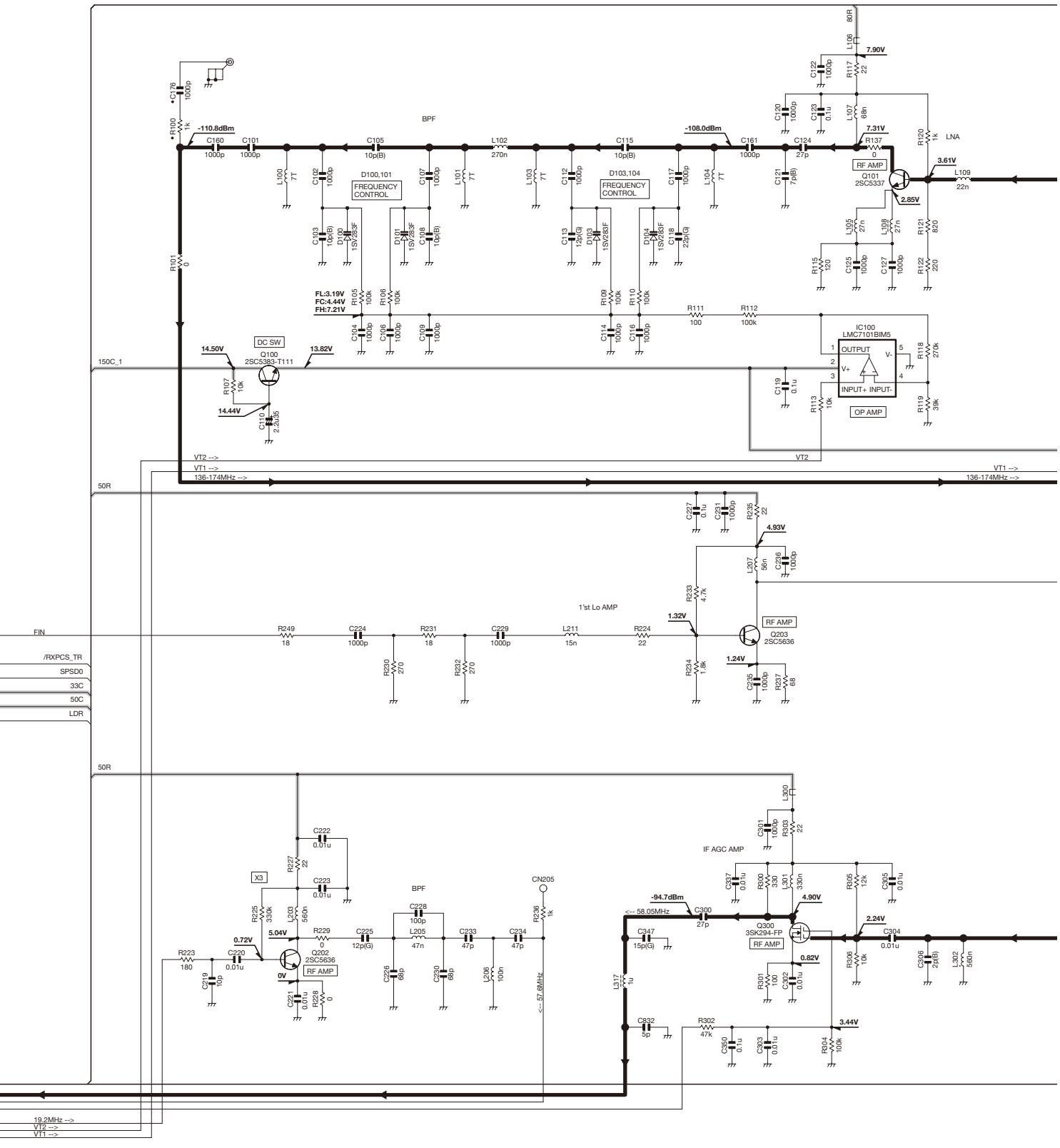
# NXR-710 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7940-10)



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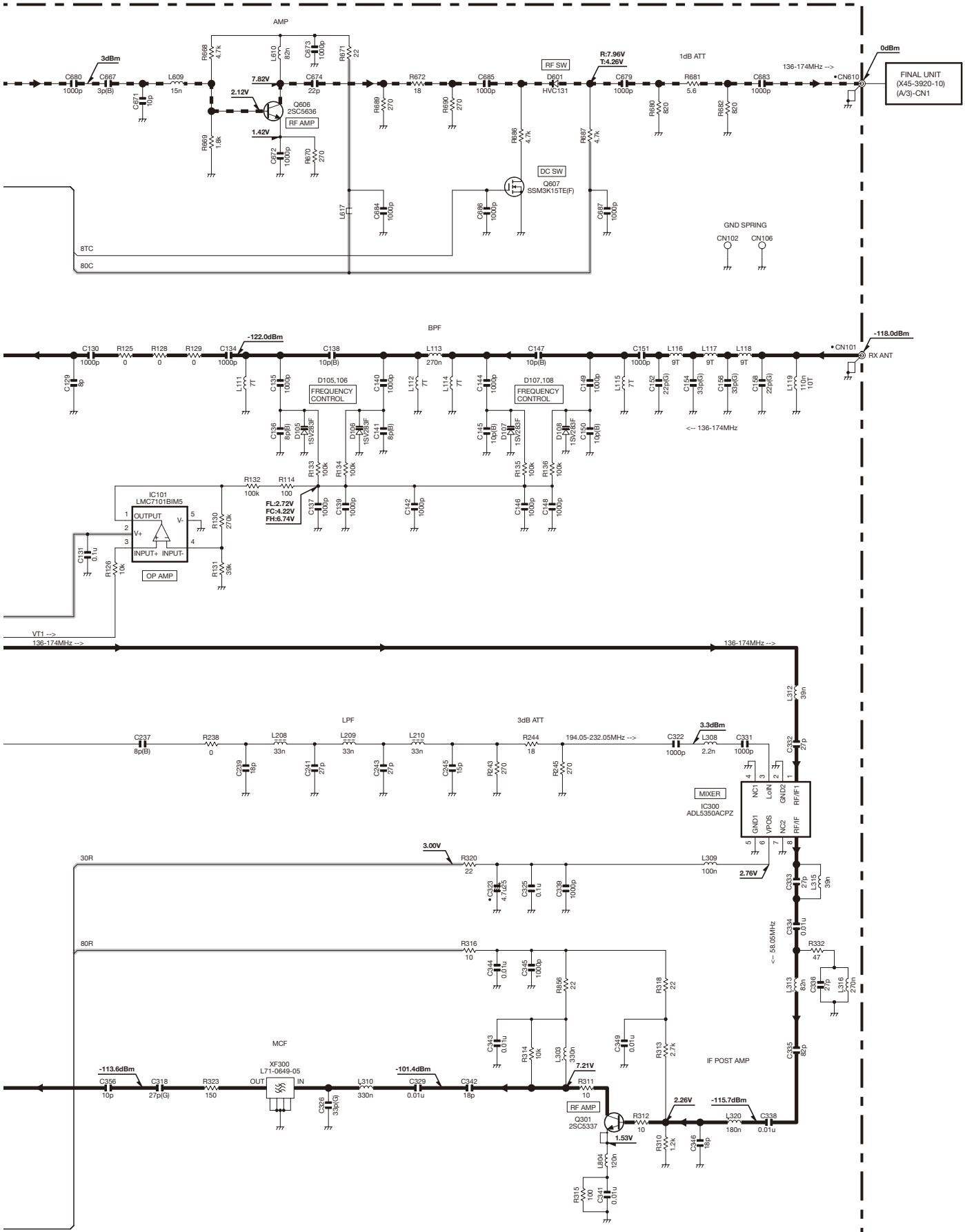
# SCHEMATIC DIAGRAM NXR-710

TX-RX UNIT (X57-7940-10)




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



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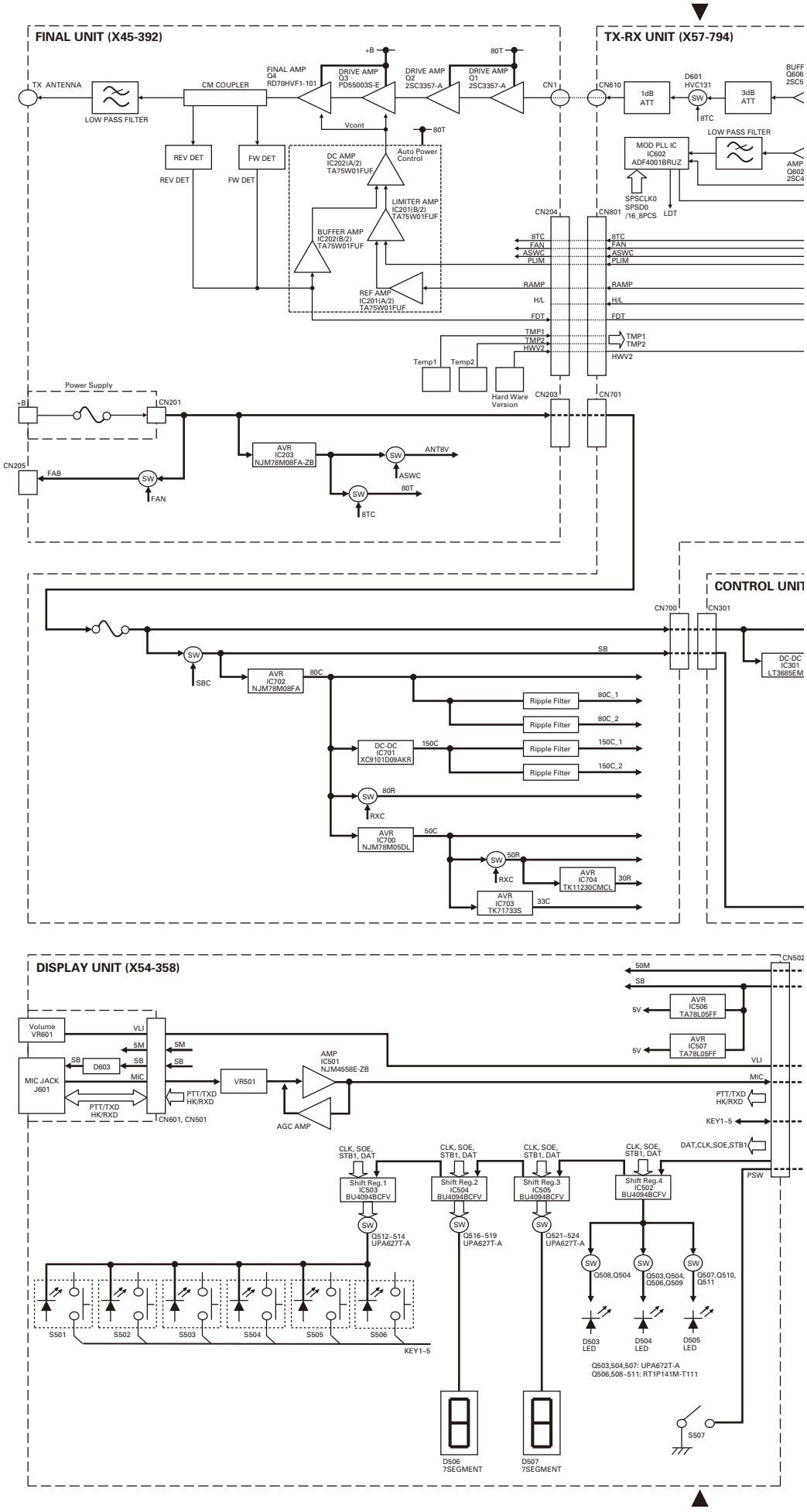
# NXR-710 BLOCK DIAGRAM



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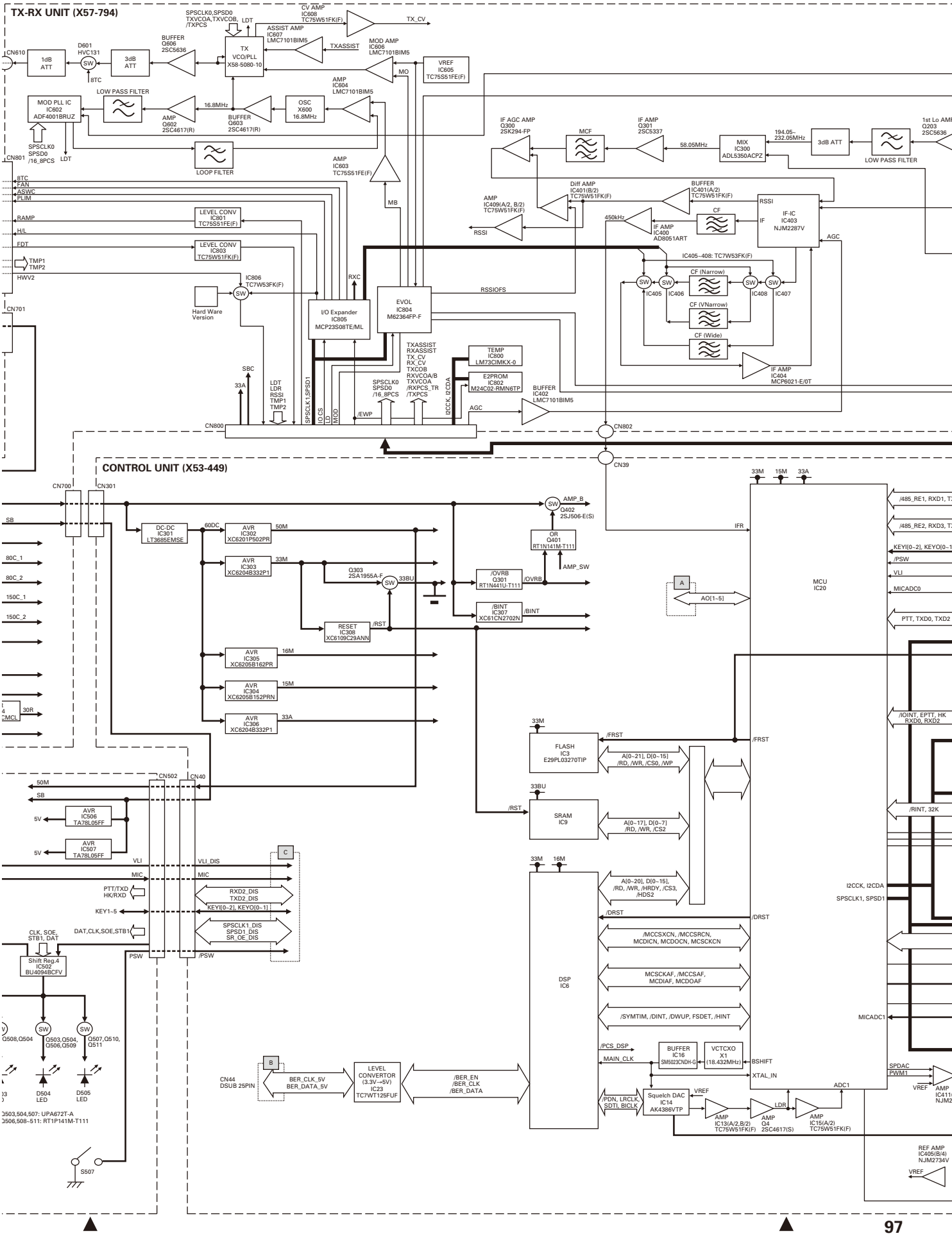




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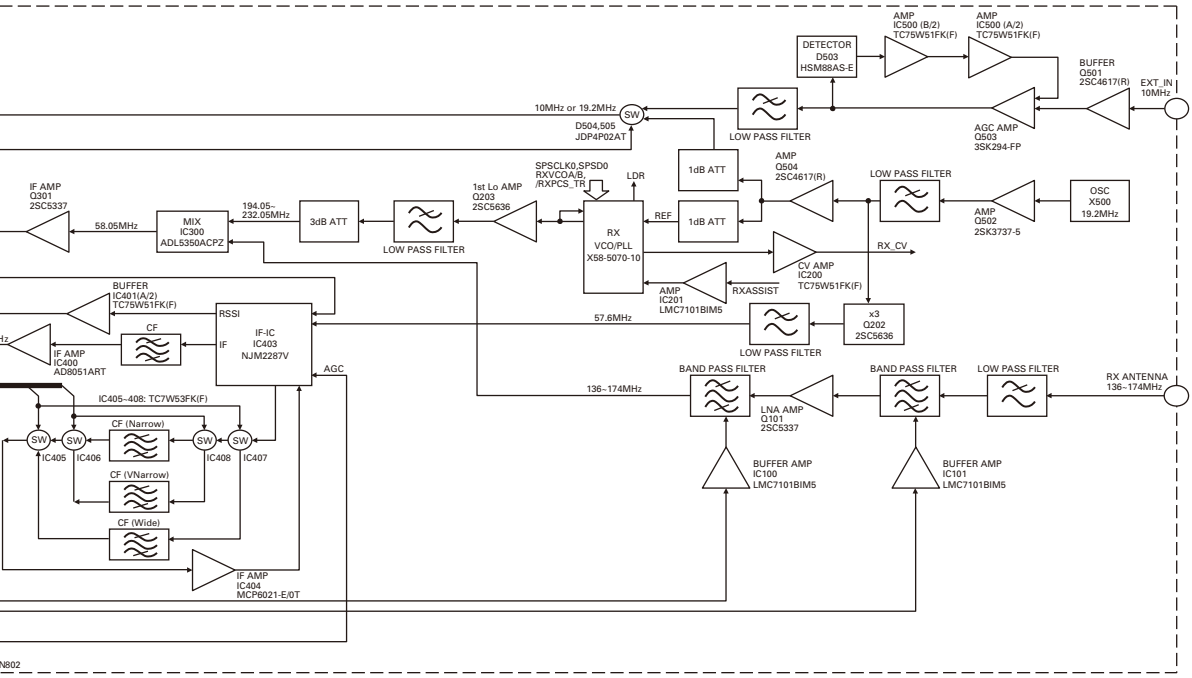
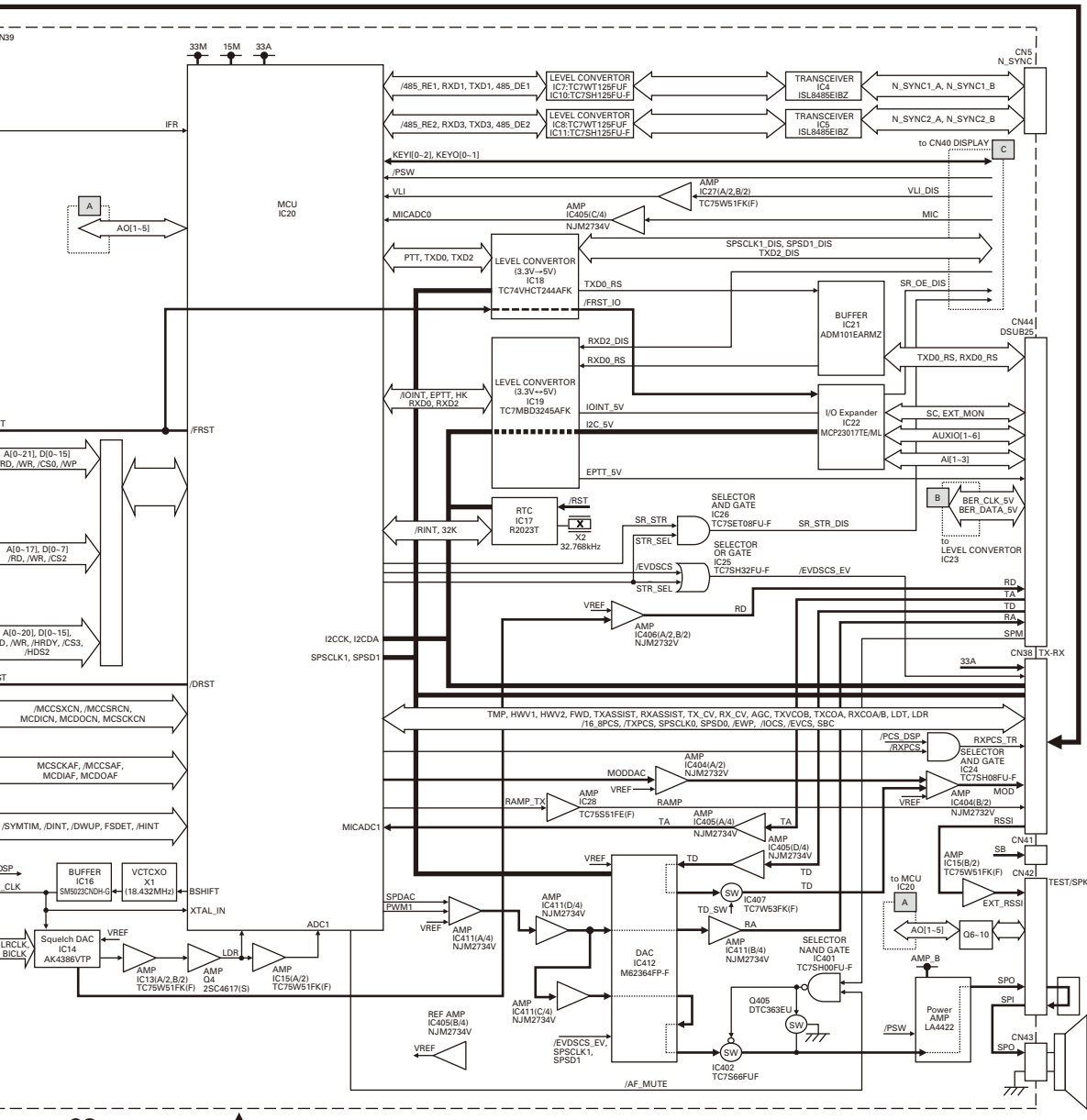
# NXR-710 BLOCK DIAGRAM



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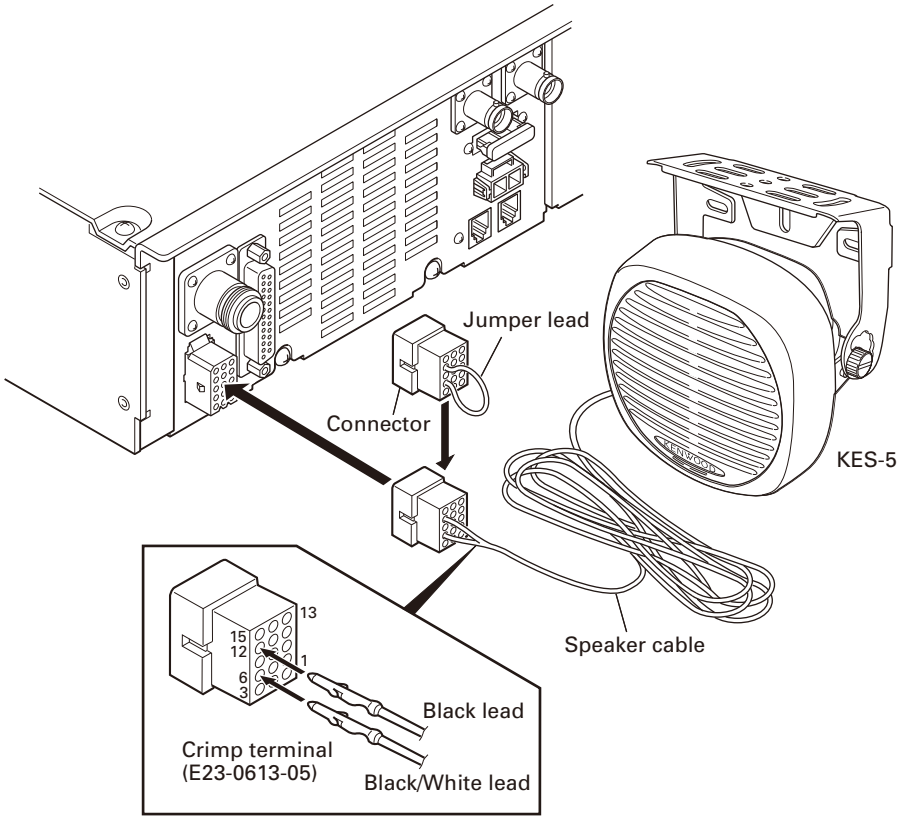
# OPTIONAL ACCESSORIES: KES-5 (EXTERNAL SPEAKER)

## 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 (5-1/16 x 5-1/16 x 3 inches)
Weight ..... 820g / 1.81 lbs



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# NXR-710

## SPECIFICATIONS

**General**

| | |
|---|---|
| Frequency Ranges | 136~174MHz |
| Number of Channels | 30ch |
| Channel Spacing | |
| Analog | 12.5/ 15/ 25/ 30kHz |
| Digital | 6.25/ 7.5/ 12.5/ 15kHz |
| PLL Channel Step | 2.5/ 3.125kHz |
| Antenna Impedance | 50Ω |
| Operating Voltage | 13.6V DC (10.8~15.6V DC) |
| Current Drain | |
| Stand-by | 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 (–22°F~+140°F) |
| Frequency Stability | ±1.0ppm (–30°C~+60°C) |
| Dimension (W x H x D) (Projections not included) | 19.02 x 3.46 x 13.39 inches (483 x 88 x 340 mm) |
| Weight | 21.4 lbs (9.7kg) |
| Applicable Standards | FCC Part 15/ 90 |

**Receiver**

| | |
|---|---|
| Sensitivity (Analogue) | |
| EIA 12dB SINAD | 0.28µV |
| Sensitivity (Digital) | |
| 3% BER | 12.5kHz: 0.28µV, 6.25kHz: 0.22µV |
| Adjacent Channel Selectivity (Analogue) | |
| 25/ 30kHz | 83dB |
| 12.5/ 15kHz | 77dB |
| Intermodulation (Analogue) | 80dB |
| Spurious Response Rejection (Analogue) | 90dB |
| Audio Distortion | Less than 2.5% |
| Audio Output (4Ω impedance) | 4W with less than 5% distortion |

**Transmitter**

| | |
|---|---|
| RF Power Output | 25~50W |
| Spurious Harmonics | 80dB |
| FM Hum & Noise (EIA) (Analogue) | |
| 25/ 30kHz | 55dB |
| 12.5/ 15kHz | 50dB |
| Modulation | 16K0F3E, 11K0F3E, 8K30F1E, 8K30F1D, 8K30F7W<br>4K00F1E, 4K00F1D,4K00F7W, 4K00F2D |


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