

# NXR-810

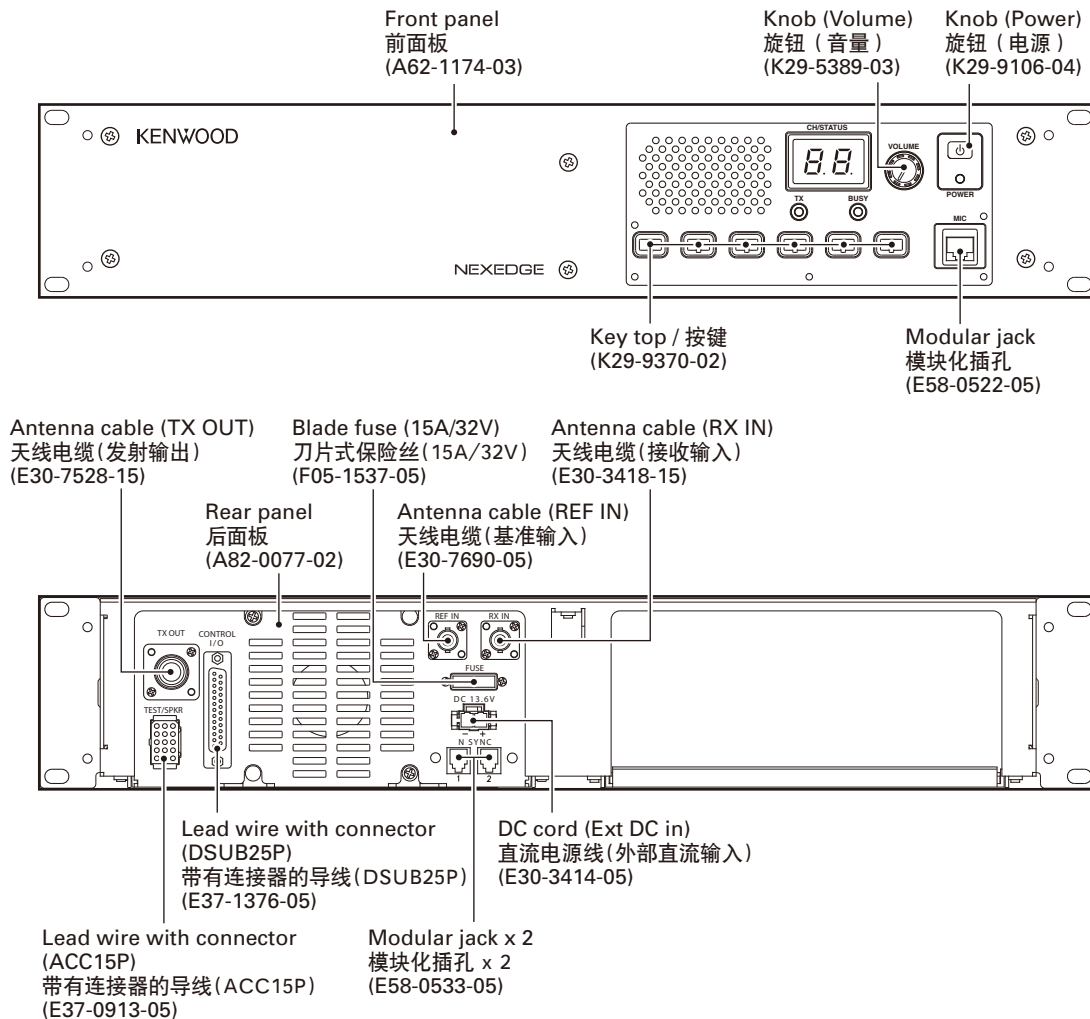
## SERVICE MANUAL / 维修手册

### C version / C 版本

# KENWOOD

Kenwood Corporation

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保护环境建伍领先

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## GENERAL / 概述

### 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 power-up 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.

### 引言

#### 本手册的范围

本手册是提供给熟悉通信专业并且具有维修经验的技术人员使用的。它包括了维修该设备所需要的全部资料和现行出版日期。在出版后可能发生变动，如果需要，可以参照《维修通报》或《手册修订本》进行补充。

#### 替换零件的订购

当订购替换零件或设备资料时，应注意完整的零件识别号码。所有的零件均有识别号码：元件，组件或机壳。如果不知道零件的号码，为了正确地识别，必须注明此元件所属的机壳或组件的号码，并对元件进行充分的说明。

#### 个人安全

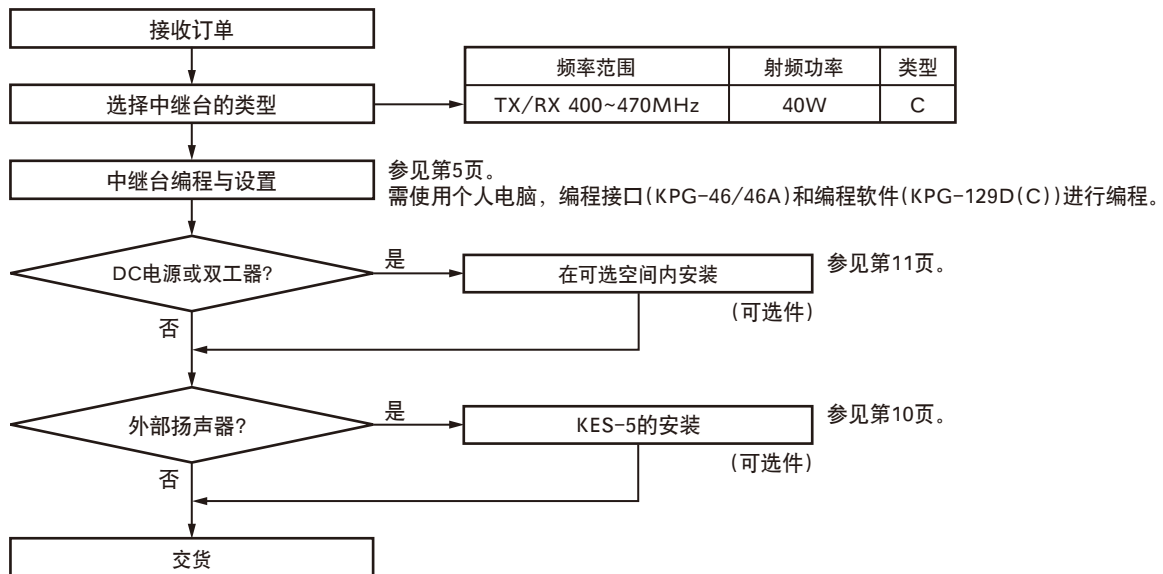
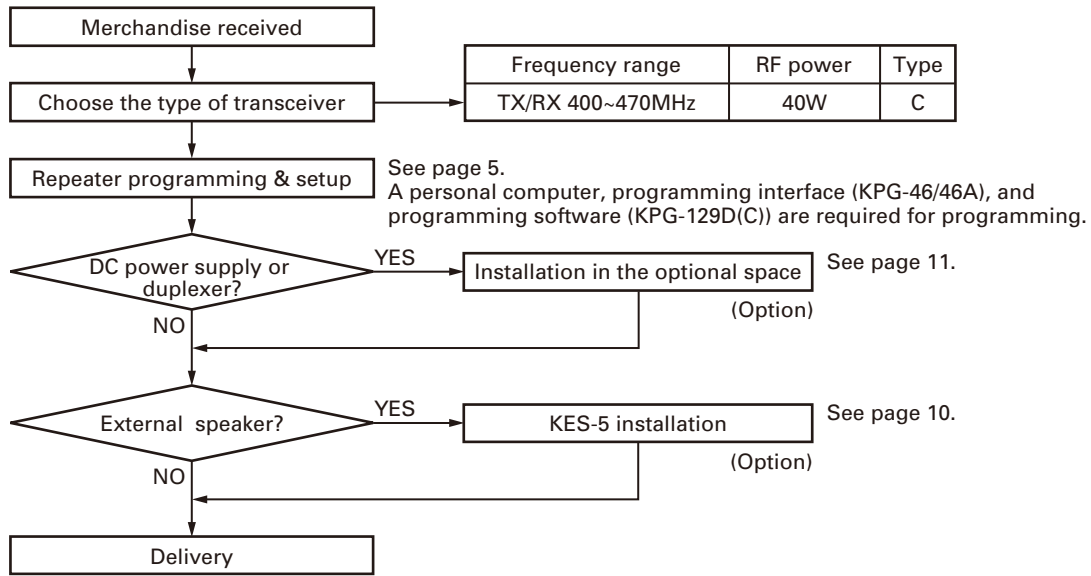
为了个人的安全，请注意下列事项：

- 如果有人在天线两英尺 (0.6 米) 范围之内时，不要进行发射。
- 在没有认真核实所有射频插头之前或有任何一个脱开的插头没有连接到相应端口上的情况下均不要发射。
- 在电爆管附近或在易燃性气体环境中，必须关闭电源，不要操作本设备。
- 为了操作的安全，在接通电源之前所有设备应该连接地线。
- 本设备只应该由有资格的技术人员进行维修。

#### 维修服务

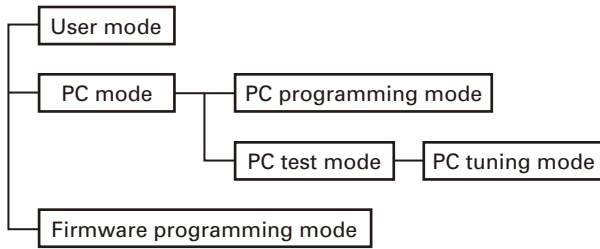
为了便于维修本设备，建立了完整的维修服务体系，提供了包括原理图，印刷电路板图和调整步骤在内的资料供参考。

## SYSTEM SET-UP / 系统体系



## REALIGNMENT / 模式组合

### 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-810 is programmed by using a personal computer, programming interface (KPG-46/46A) and programming software (KPG-129D(C)).

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

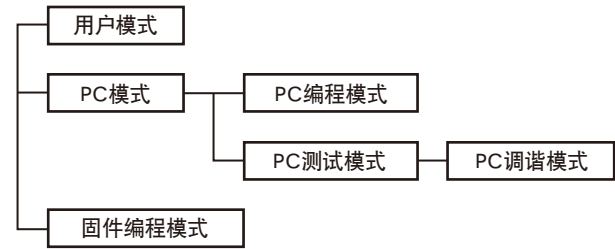
#### 3-2. Connection Procedure

1. Connect the NXR-810 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.

### 1. 模式



模式	功能
用户模式	用此模式进行一般操作。
PC模式	用此模式通过 RS-232C 端口利用 FPU 进行各种设置。
PC编程模式	用于将频率数据及其它功能写入到中继台或从中继台读取。
PC测试模式	用于通过 PC 检查中继台。该功能内置于 FPU 中。
固件编程模式	更改闪存的固件程序时使用。

### 2. 如何进入每一种模式

模式	操作
用户模式	接通电源
PC模式	从 PC 接收指令
固件编程模式	[PF1]+ 接通电源 (1 秒钟)

### 3. PC 模式

#### 3-1. 前言

NXR-810 采用个人电脑、编程接口 (KPG-46/46A) 和编程软件 (KPG-129D(C)) 进行编程。

编程软件可在 PC 上使用。图 1 说明了 PC 进行编程的设置。

#### 3-2. 连接操作

1. 用接口电缆和 USB 适配器将 NXR-810 连接到电脑 (接口电缆为 KPG-46A 时, 可以使用 KCT-53U)。

#### 注意:

- 必须在电脑上安装 KCT-53U 驱动程序才能使用 USB 适配器 (KCT-53U)。
- 首次使用 USB 适配器 (KCT-53U) 时, 请在电脑电源打开的情况下将 KCT-53U 插入电脑的 USB 端口。

## REALIGNMENT / 模式组合

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-810 to PC mode, then attach the interface cable.

**3-3. KPG-46/KPG-46A Description (PC programming interface cable: Option)**

The KPG-46/46A is required to interface the NXR-810 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-810 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(C) Description**

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

The data can be input to or read from the NXR-810 and edited on the screen. The programmed or edited data can be printed out. It is also possible to tune the NXR-810.

2. 接通电源时, 即可进入用户模式。PC 发出指令时, 中继台进入 PC 模式并在 7 段 LED 上显示 "PC"。当数据从中继台传送到 PC 时, TX LED 闪烁。中继台接收 PC 的数据时, BUSY LED 闪烁。

**注意:**

- 个人电脑储存的数据写入闪存时, 必须与机型相符。
- 将 NXR-810 改为 PC 模式, 然后连接接口电缆。

**3-3. KPG-46/KPG-46A 说明 (PC 编程接口电缆: 选配件)**

将 NXR-810 连接到电脑需要 KPG-46/46A。它的 D-sub 连接器 (KPG-46:25 针, KPG-46A:9 针) 盒中有一个电路, 可以将 RS-232C 逻辑电平转换为 TTL 电平。

KPG-46/46A 将 NXR-810 的 8 针麦克风连接器连接到电脑的 RS-232C 串行端口。

**3-4. KCT-53U 说明 (USB 适配器: 选配件)**

KCT-53U 是将 KPG-46A 连接到电脑 USB 端口的电缆。

使用 KCT-53U 时, 请在电脑上安装附带的 CD-ROM (含有驱动程序软件)。KCT-53U 驱动程序在 Windows 2000、XP 或 Vista (32 位) 下运行。

**3-5. 编程软件 KPG-129D(C) 说明**

KPG-129D(C) 是 CD-ROM 附带的用于中继台的编程软件。该软件在 PC 的 Windows XP、Vista 或 7 下运行。

可向 NXR-810 写入或读取数据, 并可在屏幕上进行编辑。可以打印编程或编辑的数据。此外, 还可调谐 NXR-810。

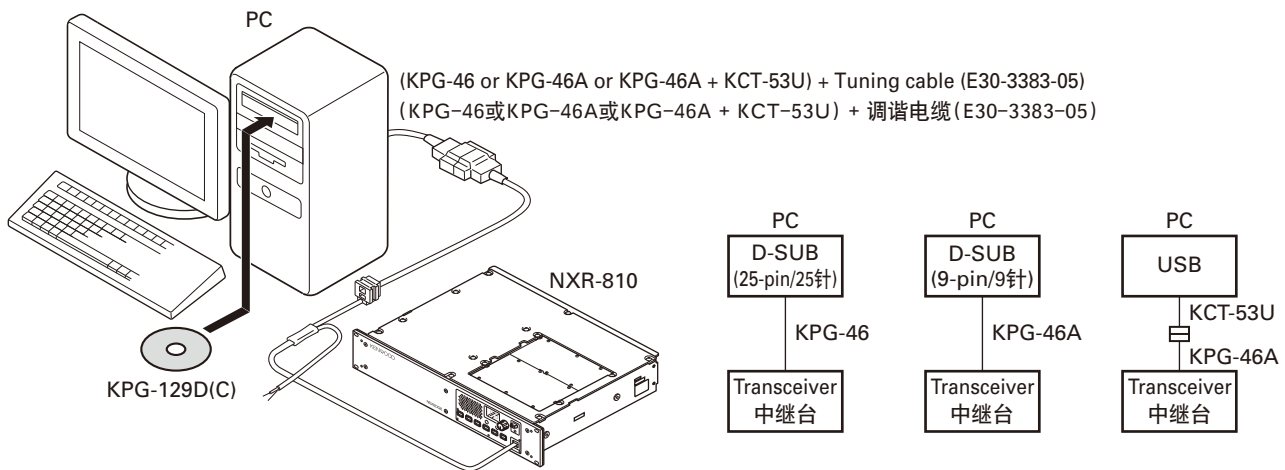


Fig. 1 / 图 1

## REALIGNMENT / 模式组合

### 4. Firmware Programming Mode

#### 4-1. Preface

The NXR-810 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-810 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(C) 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-810 power ON with the [PF1] key held down. Then, "P.G." is displayed.
5. Check the connection between the NXR-810 and the personal computer, and make sure that the NXR-810 is in the Program mode.
6. Press "write" button in the window. When the NXR-810 starts to receive data.
7. If writing ends successfully, the TX LED on the NXR-810 lights.
8. If you want to continue programming other NXR-810s, repeat steps 4 to 7.

#### Note:

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

#### 4-4. Function

If you press the [PF6] key while "P.G." is displayed, the display changes to "P G" to indicate that the write speed is low speed (38400 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 medium 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.

### 4. 固件编程模式

#### 4-1. 前言

NXR-810 使用闪存，以便于在将来发布新功能时进行升级。

#### 4-2. 连接操作

用接口电缆 (KPG-46/46A) 和 USB 适配器 (KCT-53U: 接口电缆为 KPG-46A 时，可以使用 KCT-53U。) 将 NXR-810 连接到个人电脑。(连接方式与 PC 模式下相同。)

#### 注意：

您只能通过前面板的 8 针麦克风连接器对固件进行编程。使用后面板的 25 针逻辑接口进行编程时不起作用。

#### 4-3. 编程

1. 启动固件编程软件 (Fpro.exe (ver. 4.1 或更高版本))。Fpro.exe 存在于 KPG-129D(C) 安装文件夹内。
2. 在配置项中设置通信速度 (通常为 115200 bps) 和通信端口。
3. 通过文件名项设置要更新的固件。
4. 按住 [PF1] 键打开 NXR-810 的电源。此时，显示 "P.G."。
5. 检查 NXR-810 与个人电脑之间的连接，确认 NXR-810 处于编程模式。
6. 按窗口中的写入按钮。NXR-810 开始接收数据。
7. 如果成功完成写入，NXR-810 上的 TX LED 亮起。
8. 若要继续为其他 NXR-810 编程，请重复步骤 4 到 7。

#### 注意：

如果编程软件的固件编程模式设为禁用，则无法进入此模式。

#### 4-4. 功能

如果在显示 "P.G." 时按 [PF6] 键，则显示变为 "P G" 以表示写入速度为低速 (38400 bps)。如果在显示 "P G" 时再次按 [PF6] 键，则显示变为 "P G." 以表示写入速度为中速 (57600 bps)。如果在显示 "P G." 时再次按 [PF6] 键，则显示变为 "P.G." 以表示写入速度为高速 (115200 bps)。

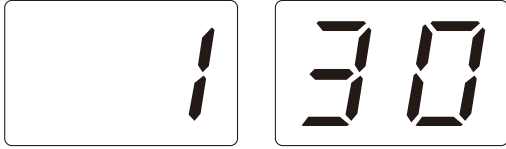
#### 注意：

通常以高速模式写入。

## 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.



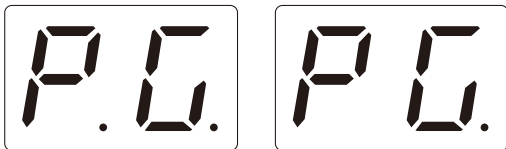
- When the displayed channel is the priority channel, the left side decimal point is displayed.



- "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



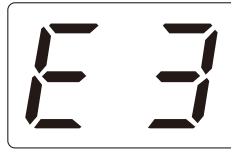
- "E1" is displayed when FPU data is not written.



- "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.

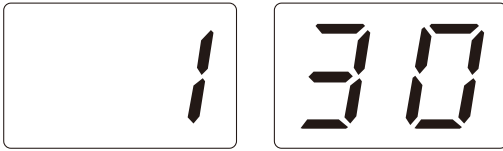




## 操作特性

### 1. 两个 7 段 LED 显示

- 信道显示 (1 ~ 30): 以用户模式正常操作时。



- 显示的信道包含在扫描序列中时, 显示右侧的小数点。



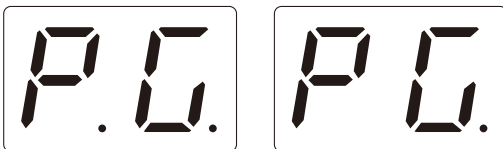
- 显示的信道为优先信道时, 显示左侧的小数点。



- 处于 PC 模式时, 显示 “PC”。



- 处于固件编程模式时, 显示 “PG”。
- 显示 2 个小数点 = 115, 200bps  
 显示 1 个小数点 = 57, 600bps  
 无小数点 = 38, 400bps



- 未写入 FPU 数据时, 显示 “E1”。



- 未写入信道数据时, 显示 “E2”。



- PLL 失锁时, 显示 “E3”。
- 接收机 PLL 失锁 = BUSY LED 闪烁。  
 发射机 PLL 失锁 = TX LED 闪烁。



- 在未编写 TX 频率数据的信道上尝试 PTT 时, 显示 “E4”。



- 处于扫描模式时, 显示 “SC”。



- “E5” 表示 ESN 空白错误。



- “E.6.” 表示 MCU 内部 RAM 错误。



- “E6.” 表示 DSP RAM 错误。



- “E6” 表示 MCU 外部 RAM 错误。



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

The NXR-810 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-810

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

The following tools are required for changing the connector.

##### • Extracting tool

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

1. Remove the connector with jumper from the external speaker connector on the rear panel of the radio. (Fig.1-1)

**Note:** Save the jumper, which is required when the radio is used without the external speaker.

2. Remove the terminals with the jumper from the connector housing holes number 9 and 12 using the extracting tool.

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

1) Insert the extracting tool (11-03-0002) into the connector while pushing the jumper lead in the direction of (a).  
2) Push the extracting tool in to collapse the barbs of the crimp terminal.

3) Pull out the lead while continuing to push the extracting tool in the direction (b).

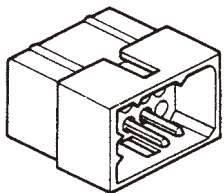
3. Reinsert the terminal with the black and white stripe lead into hole number 12, and the terminal with the black lead into hole number 6. (Fig. 1-3)

4. Attach the connector to the external speaker connector on the radio.

##### Note:

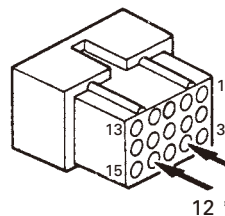
Relationship between the TEST/SPKR connector (15-pin) connection and speaker output:

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



Square-type plug / 方形插头  
(E31-3228-05)  
Accessory / 附件

Fig. 1-1 / 图 1-1



Crimp terminal / 压接式端子  
(E23-0613-05)

Black lead / 黑导线  
Black/White lead / 黑白条纹导线

Fig. 1-3 / 图 1-3

### 1. 外部扬声器 (KES-5)

NXR-810 有一个内置扬声器 (5W/8Ω), 从中继台后面的 TEST/SPKR 连接器 (15 针) 输出的外部扬声器为 4W/4Ω。可使用外部扬声器 KES-5。

#### 1-1. KES-5 与 NXR-810 的连接

##### ■ 采用从中继台后面的 TEST/SPKR 连接器 (15 针) 输出的 AF 时

改变连接器时, 须使用以下工具。

##### • 拔除工具

推荐使用以下拔除工具:  
Molex Inc., 订购号: 11-03-0002 (W05-0878-00)

1. 从中继台后面板的外部扬声器连接器上拆下带跳线的连接器。(图 1-1)

**注意:** 请保留跳线, 在没有外部扬声器的情况下使用中继台时需使用该跳线。

2. 用拔除工具从连接器壳的第 9 和 12 孔中拆下带跳线的端子。拆下跨接线 (图 1-2)

1) 沿 (a) 的方向推动拔除工具的同时, 将拔除工具 (11-03-0002) 插入连接器。

2) 推入拔除工具, 折起压接式端子的倒钩。

3) 继续沿 (b) 的方向推动拔除工具的同时, 拔出导线。

3. 将带黑白条纹导线的端子插入第 12 孔, 将带黑导线的端子插入第 6 孔。(图 1-3)

4. 将连接器安装到中继台上的外部扬声器连接器。

##### 注意:

TEST/SPKR 连接器 (15 针) 连接与扬声器输出之间的关系。

- 第 9 和 12 针短路时: 使用内置扬声器。
- 第 9 和 12 针开路并从第 6 和 12 针输出时: 使用 KES-5。

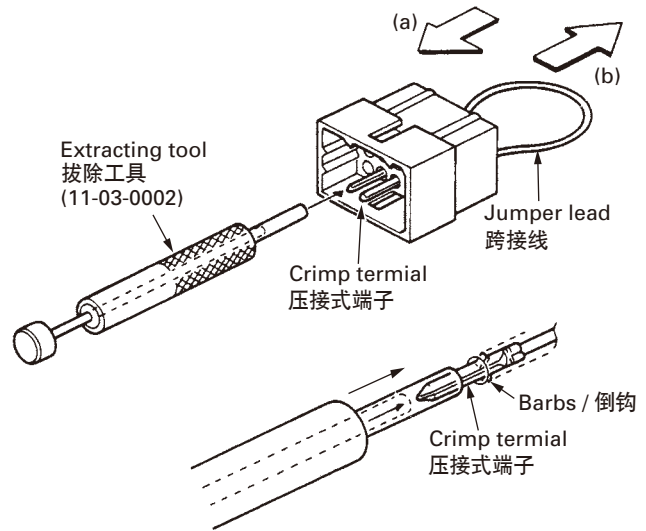


Fig. 1-2 / 图 1-2

## INSTALLATION / 安装

### 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.

### 2. 附件柜

可以在附件柜中安装 DC 电源或双工器等选购附件。

1. 如下图所示，将选购附件安置在附件柜中。
2. 如有必要，可将缓冲垫 (G13-1801-04 和 / 或 G13-1802-04) 安装到顶板 (J21-8559-04) 上，以调整附件柜和顶板之间的空间。然后，将顶板的 3 个卡舌插入附件柜侧的插槽。具有高、中、低三种位置。要固定顶板，请在顶板的另一侧插入并拧紧 2 颗螺丝。

也可以翻转顶板，以调整附件柜空间的高度。

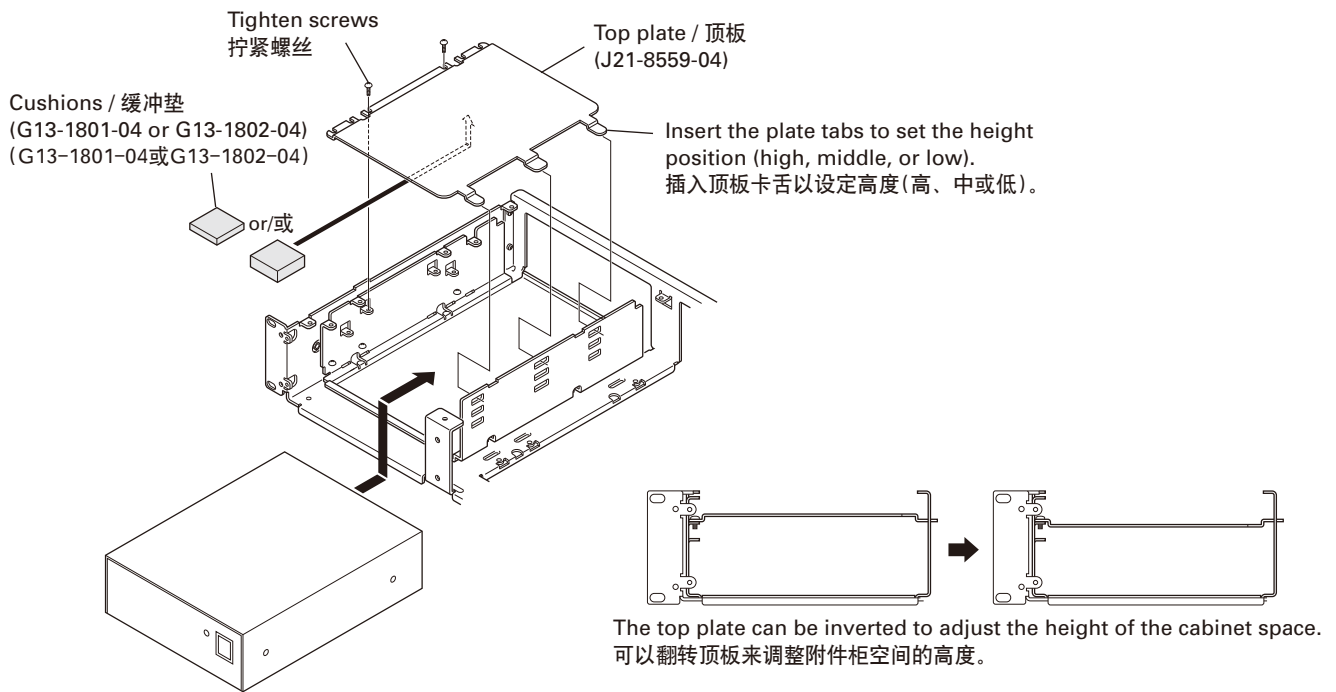


Fig. 2 / 图 2

## INSTALLATION / 安装

### 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).

### 3. 按键盖板

为避免不慎按下按键，可安装按键盖板。

1. 用自带的 5 颗螺丝 (N35-3006-43) 安装并固定按键保护装置。

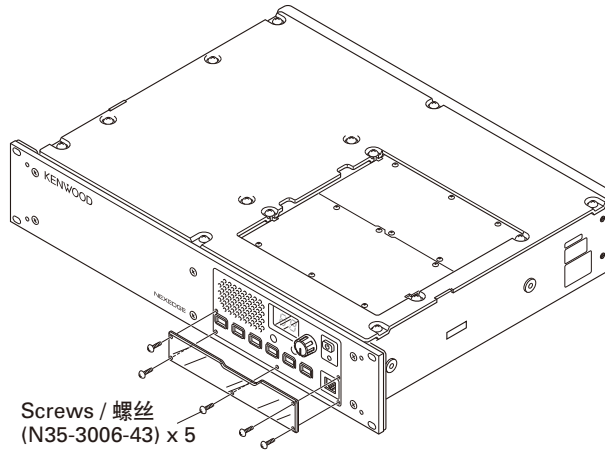


Fig. 3 / 图 3

### 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.

### 4. 桌面中继台

在桌面上使用中继台时，可以如图所示在中继台的底部安装 4 个垫圈。安装这些垫圈之后，前面板就不会接触桌面。

**Pegs**  
Firmly press these pegs (J59-0302-05) through the spacers to affix them to the repeater.

**拴钉**  
用力按这些拴钉 (J59-0302-05)，使其穿过垫圈，把它们固定到中继台上。

Peel off the backing paper to attach these spacers (J02-0492-04).  
剥下衬纸来安装这些垫圈 (J02-0492-04)。

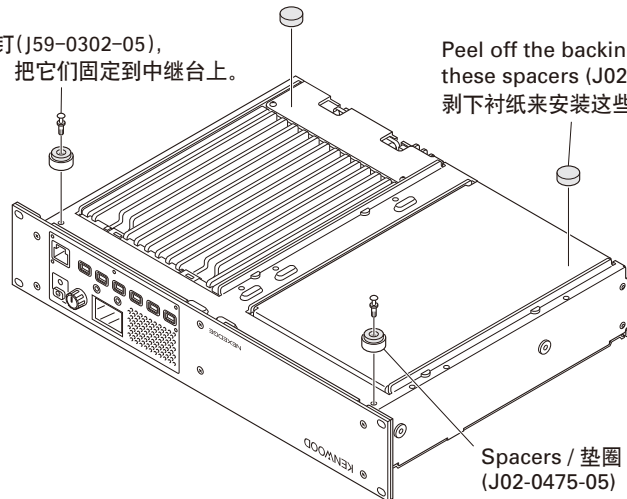


Fig. 4 / 图 4

## INSTALLATION / 安装

### 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.

### 5. 安装按键功能表示贴片

取出按键功能表示贴片。然后将贴片插到相关的功能键上。可随时重新装配按键功能表示贴片。

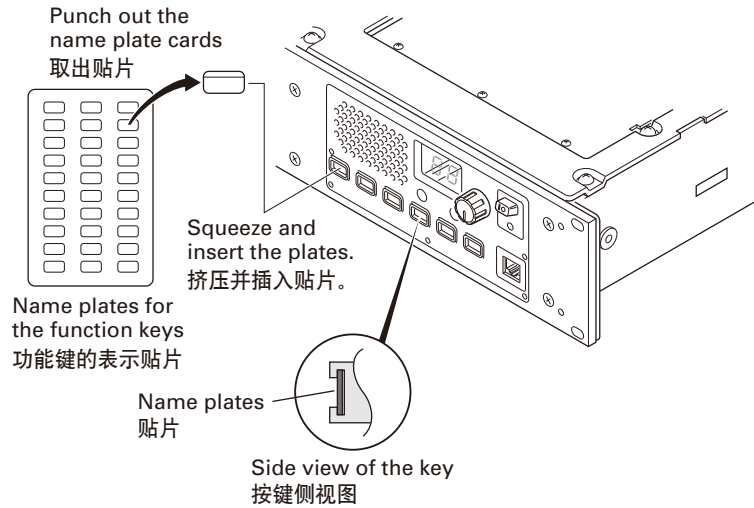


Fig. 5 / 图 5

## MODIFICATION / 改装

### 1. DC Source Switch

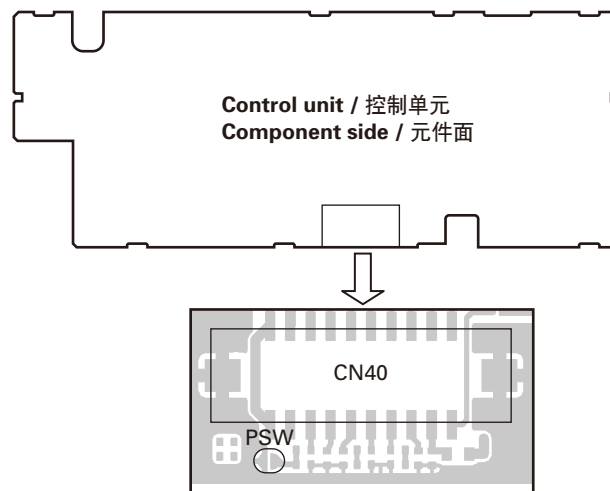
To prevent the power supply from turning off due to misoperation of the DC source switch on the front panel or accidents (tampering) after installation, the main unit can be kept on regardless of the on/off setting of the DC source switch on the front panel.

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

### 1. DC 电源开关

为防止因前面板上的 DC 电源开关的误操作或安装后的意外（窜改）而关闭电源，可以使主机不论前面板上的 DC 电源开关的开 / 关设定如何，均保持在开启状态。

用焊料将 PSW 焊盘短接到 CN40 连接器附近。



## MODIFICATION / 改装

### 2. Single Antenna

The NXR-810 can be used as a base station by sharing an external antenna connector for both transmitting and receiving data.

#### 2-1. Modification

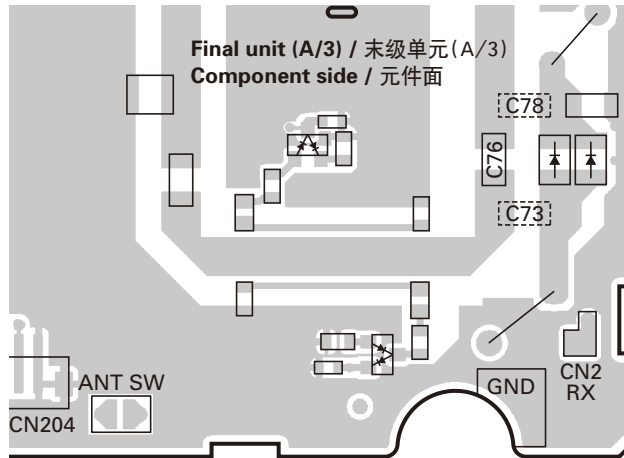
- Using a soldering iron, delete C76 and add C73 and C78 (100pF; C93-0572-05) on the Final unit (A/3).

### 2. 单天线

使发射和接收信号共用一个外部天线连接器，可以将 NXR-810 用作基站。

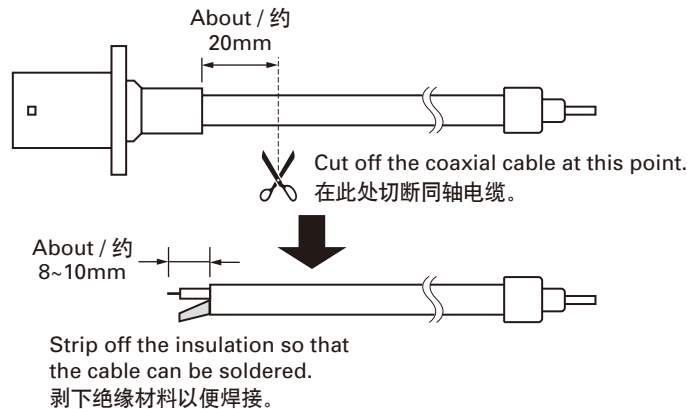
#### 2-1. 更改

- 在末级单元 (A/3) 上，用烙铁除去 C76 并增加 C73 和 C78 (100pF; C93-0572-05)。



- Short-circuit the printed pattern of ANT SW near the CN204 connector by soldering.
- Disconnect the pin connector from CN101 of the TX-RX unit.  
Remove the two screws used for securing the BNC connector on the back panel of the unit. Detach the antenna cable assy. (E30-3418-15)
- Cut off the coaxial cable of the removed antenna cable assy on the BNC connector side.  
Strip off the insulation of the cut-off coaxial cable to prepare it to be soldered.

- 以焊接方式将 ANT SW 的印刷图案短接到 CN204 连接器附近。
- 从 TX-RX 单元的 CN101 断开针脚连接器。  
拆下用于将 BNC 连接器固定在单元背板上的两颗螺丝。拆下天线电缆组件。(E30-3418-15)
- 切断已拆下的天线电缆组件的 BNC 连接器侧的同轴电缆。  
剥下所切同轴电缆的绝缘材料，做好焊接准备。



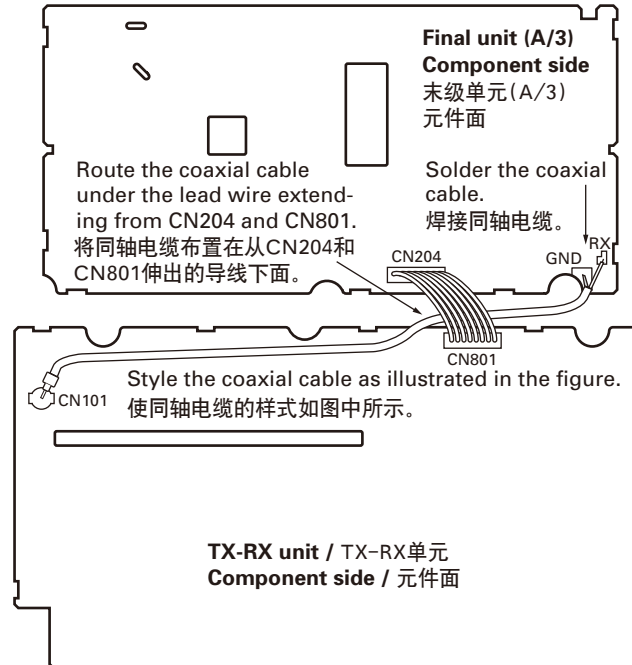
## MODIFICATION / 改装

### 2-2. Connection

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

### 2-2. 连接

1. 将准备好的同轴电缆焊接到末级单元 (A/3)。
2. 将同轴电缆的针脚连接器连接到 TX-RX 单元的 CN101。



### 2-3. Setting the FPU

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

### 3-3. 设置 FPU

使用 FPU，将信道设置为用作“单工”。如有必要，请检查或重新调整发射功率。

# NXR-810

## DISASSEMBLY FOR REPAIR / 维修拆卸

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

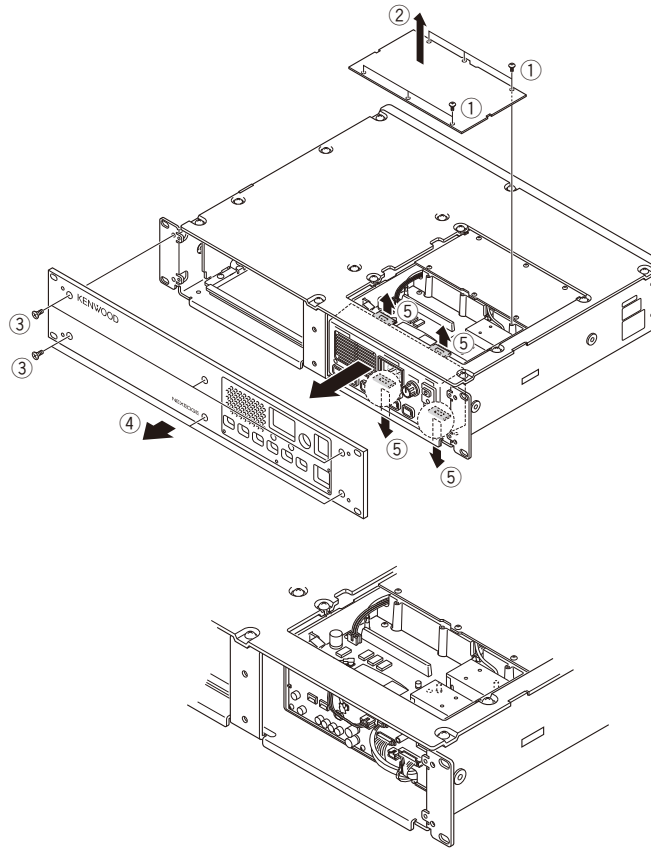
**Note:** You can remove the panel assembly (ABS) without removing the top panel (A62-1148-03).

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

### 1. 如何拆下面板组件 (ABS)

**注意:** 您可以拆下面板组件 (ABS) 而不拆下顶板 (A62-1148-03)。

1. 要拆下面板 (TX-RX, ②), 请松开 6 颗螺丝 (①)。
2. 要拆下面板组件 (前部, ④), 请松开 6 颗螺丝 (③)。
3. 面板组件 (ABS) 由上下 4 个卡舌 (⑤) 牢牢固定。在向上拔卡舌的同时向前拉面板组件, 便可将其拆下。





# CIRCUIT DESCRIPTION / 电路说明

## 1. Outline

The NXR-810 is a UHF repeater operating in the 400~470MHz frequency range.

## 2. TX-RX unit

TX-RX unit (X57-795) 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.

## 1. 概述

NXR-810 是在 400 ~ 470MHz 频率范围内工作的 VHF 中继台。

## 2. TX-RX 单元

TX-RX 单元 (X57-795) 由以下电路组成。

- (1) 内部 / 外部基准电路
- (2) 发射机基准 16.8MHz PLL 电路
- (3) 发射机主 PLL 电路
- (4) 调制电平调整电路
- (5) 前端电路
- (6) 第 1 混频器电路
- (7) IF 电路
- (8) 接收机 PLL 电路
- (9) AVR 电路
- (10) 其他电路

### 2-1. 内部 / 外部基准电路

内部基准电路由 X500、Q502、Q504 和 D505 组成。19.2MHz VCTCXO (X500) 的输出被送入缓冲放大器 Q502。较高的谐波由 LPF 衰减。该基准信号作为第 2 本地信号通过三倍频器送到 IF IC (IC304)。

内部基准信号由 Q504 放大，以获得 PLL IC 的所需电平。该信号由 Wilkinson 分配器进行分割。分割的信号被送入接收机的 PLL IC。另一信号通过可进行内部基准或外部基准信号切换的 PIN 二极管开关 (D505) 送入 16.8MHz PLL IC。

外部基准电路由 CN500、Q501、Q503、IC500、IC501、D503 和 D504 组成。从 CN500 输入的外部基准信号 (10MHz/0dBm) 被送到缓冲放大器 Q501，由 Q503 放大。Q503 为双栅 MOS-FET。放大器 (Q503) 的输出由 D503 进行检测，DC 电压由 IC500 (B/2) 放大。放大的 DC 电压由 IC500 (A/2) 与基准电压进行比较。电压差由 IC500 (A/2) 放大，并被送入 Q503 的栅 2 端子。Q503 栅 -2 端子的电压为自动控制，以稳定地保持放大器 (Q503) 的功率输出。放大器 (Q503) 的输出通过可进行内部基准或外部基准信号切换的 PIN 二极管开关 (D504) 送入 16.8MHz PLL IC。

PIN 二极管开关 (D504, D505) 由 I/O 扩展器 IC (IC805 引脚 15) 控制。I/O 扩展器 IC 由控制单元 (X53-449) 内的 MCU 控制。

如果 FPU 选择了内部基准，则 I/O 扩展器 IC 输出 "H" 状态。该信号开启 Q506 电源开关。然后 D505 被激活。

如果选择了外部基准，则 I/O 扩展器 IC 输出 "L" 状态。该信号开启 Q500 电源开关。然后 D504 被激活。

## CIRCUIT DESCRIPTION / 电路说明

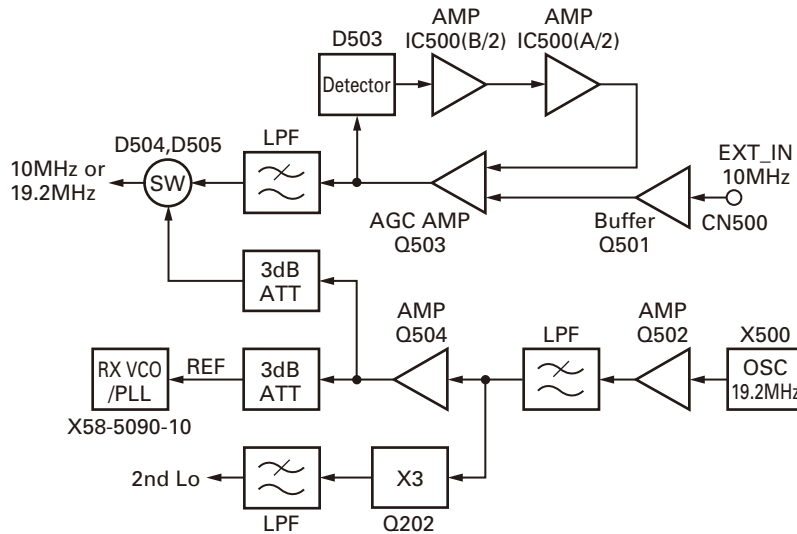


Fig. 1 Internal/external reference circuit / 图 1 内部 / 外部基准电路

### 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.

### 2-2. 发射机基准 16.8MHz PLL 电路

发射机基准 16.8MHz PLL 电路产生发射机主 PLL 电路的基准频率信号，并调制低频分量。

该电路由 IC600、IC601、IC602、IC603、IC604、Q601、Q602、Q603 和 X600 组成。

VCXO (X600) 信号进入缓冲放大器 Q603，由 Q602 放大。较高的谐波由 LPF 衰减并返回 IC602。其相位与基准频率 5kHz 的相位进行对比。

通过相位对比产生的相位差信号由一个滞后超前式环路滤波器转换为 DC 电压。该 DC 电压被输入 IC604 反相放大器并与调制信号合成。该 DC 电压被输入用于控制 VCXO 振荡频率 16.8MHz 的 X600 控制电压端子。

16.8MHz 震荡信号被送入 Q603 缓冲放大器。缓冲放大器的输出信号用作发射机主 PLL 电路的基准频率信号。

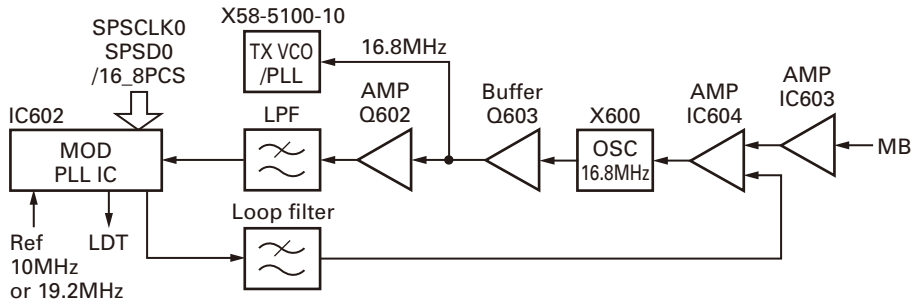


Fig. 2 Transmitter reference 16.8MHz PLL circuit / 图 2 发射机基准 16.8MHz PLL 电路

## CIRCUIT DESCRIPTION / 电路说明

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

#### ■ VCO

The TX VCO circuit consists of two VCOs (VCO A X58-510: Q352, VCO B X58-510: Q353). Those VCOs generate a transmit carrier. VCO A Q352 produces a transmitter frequency from 400.000MHz to 434.995MHz. VCO B Q353 produces a transmitter frequency from 435.000MHz to 470.000MHz.

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 (X58-510: 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.

### 2-3. 发射机主 PLL 电路 (SUB 单元)

#### ■ VCO

TX VCO 电路由两个 VCO (VCO A X58-510:Q352, VCO B X58-510:Q353) 组成。这些 VCO 生成发射载波。VCO A Q352 产生从 400.000MHz 到 434.995MHz 的发射机频率。VCO B Q353 产生从 435.000MHz 到 470.000MHz 的发射机频率。

这些 VCO 振荡频率由电压控制端子的两个系统：“CV”和“TXASSIST”决定。

电压控制端子“CV”和“TXASSIST”由 PLL IC (X58-510: IC300) 和 MCU (X53-449: IC20) 控制，并根据施加的电压连续输出频率变化。对于调制输入端子“MO”，输出频率根据施加的电压改变。

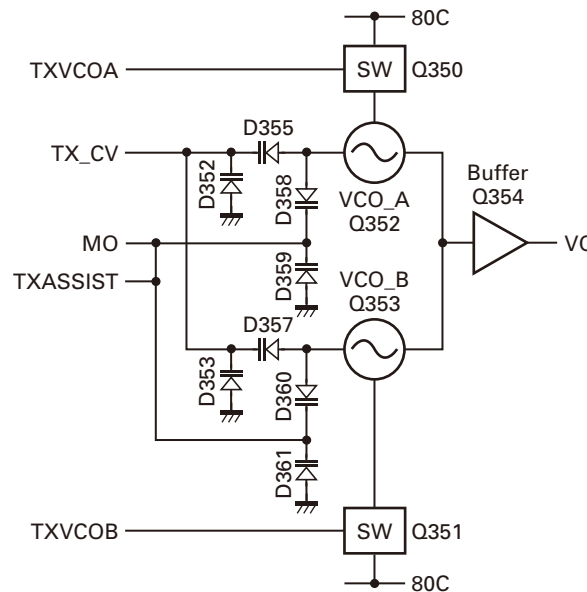


Fig. 3 Transmitter VCO circuit / 图 3 发射机 VCO 电路

#### ■ PLL IC (X58-510: 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.

#### ■ PLL IC (X58-510: IC300)

PLL IC 对比 VCO 振荡频率和发射机 PLL 基准信号 (16.8MHz) 的相位差，将相位差返回 VCO CV 端子，实现返回控制的“锁相环路”。这可以使 VCO 振荡频率与所需的频率精确匹配（锁定）。

频率由 PLL 控制时，频率锁定时间将随着设定频率改变时频率差的增大而增加。为对此进行补充，在由 PLL IC 控制之前使用 MCU 以使 VCO 振荡频率接近所需的频率。因此，VCO CV 的电压不变，始终稳定在约 3.0V。

## CIRCUIT DESCRIPTION / 电路说明

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.

PLL IC 的所需频率由 MCU (X53-449: IC20) 通过 3 线路 "SPSD0"、"SPSCLK0"、"/TXPCS" 串行总线进行设定。PLL IC 锁定与否由 MCU 通过 "LDT" 信号线路进行监测。如果 VCO 不是所需的频率 (失锁), 则 "LDT" 逻辑较低。

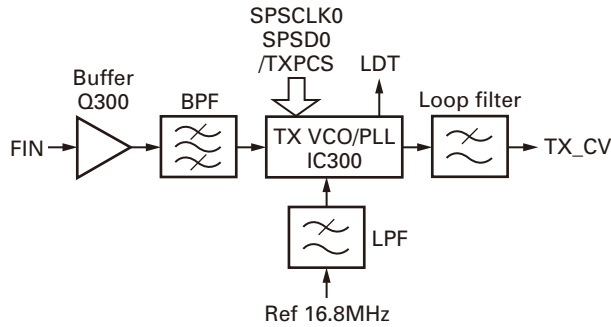


Fig. 4 Transmitter Main PLL circuit / 图 4 发射机主 PLL 电路

### 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 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.

### 2-4. 调制电平调整电路

调制电平调整电路用于调整调制波形平衡。该电路由 IC804、IC603、IC604、IC605 和 IC606 组成。

调制信号通过接口连接器 (CN800 针脚 14) 来自控制单元 (X53-449)。调制信号由到发射机调制 16.8MHz PLL 电路的调制低调音产生, 并把高调调制加到发射机主 PLL。

IC804 是一个电子音量控制 IC。它有 8 个电子音量控制电路。调制电平调整电路使用 IC804 中的 2 个电子音量控制电路。第 1 电子音量控制电路调制调制信号, 并送入 IC603 和第 2 电子音量控制电路。第 2 电子音量控制电路调整调制信号并送入 IC606。

IC603 是一个反相放大器, 用于变换调制信号的放大。IC603 的输出和 IC602 (发射机调制 16.8MHz PLL IC) 的电荷泵输出由 IC604 合成并送入 VCXO (X600)。

IC606 是一个非反相放大器。第 2 电子音量控制电路的输出由 IC606 放大并送入发射机主 PLL 电路。

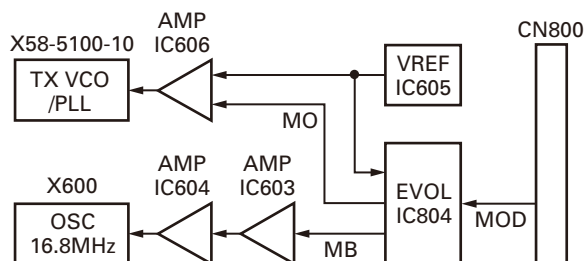


Fig. 5 Modulation level adjustment circuit / 图 5 调制电平调整电路

## CIRCUIT DESCRIPTION / 电路说明

### 2-5. Front-end circuit

The front-end circuit consists of former LPF, former BPF (D105, D106, D107 and D108), RF Low Noise Amplifier (Q101), latter BPF (D100, D101, D103 and D104), and latter LPF. The BPF covers frequency ranges 400 to 470MHz.

The former LPF, former BPF, latter BPF, and latter LPF attenuate the unwanted signals and send only the necessary signal to the first mixer.

### 2-5. 前端电路

前端电路由前级 LPF、前级 BPF (D105、D106、D107 和 D108)、RF 低噪声放大器 (Q101)、后级 BPF (D100、D101、D103 和 D104)、以及后级 LPF 组成。BPF 覆盖的频率范围为 400 到 470MHz。

前级 LPF、前级 BPF、后级 BPF 和后级 LPF 衰减不需要的信号，然后仅将必要的信号发送给第一混频器。

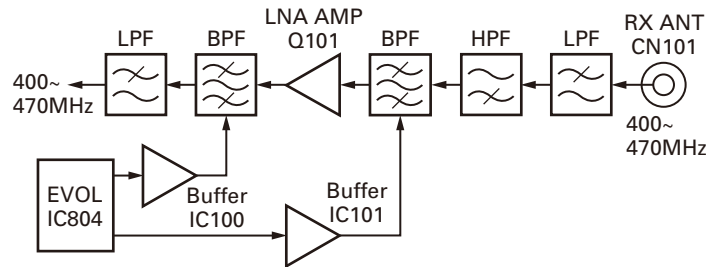


Fig. 6 Front-end circuit / 图 6 前端电路

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

The filtered signal from 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 58.05MHz first intermediate frequency (IF) signal.

### 2-6. 第 1 混频器电路

来自前端电路的过滤信号与第一混频器 (IC300) 的 PLL 频率合成器电路的第一本地振荡信号进行外差，成为 58.05MHz 的第一中频 (IF) 信号。

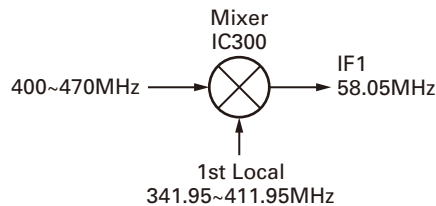


Fig. 7 1st-Mixer circuit / 图 7 第 1 混频器电路

### 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 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).

### 2-7. 中频电路

第一中频信号由 IF 放大器 (Q301) 放大，并经过一个四极的单片晶体滤波器 (XF300) 以消除临近信道的信号。滤波后的第一中频信号由 IF AGC 放大器 (Q300) 放大后，加到中频系统 IC (IC403) 上。中频系统 IC 提供一个第二混频器、AGC 放大器和 RSSI (接收信号强度指示器)。

第二混频器混合第一中频信号及 57.6MHz 的第二本地振荡器输出，生成 450kHz 的第二中频信号。

第二中频信号通过陶瓷滤波器 (CF401、CF402 和 CF403) 以消除临近信道的信号。经过滤波的第二中频信号由第二 IF 放大器 (IC404) 和 AGC 放大器 (IC403) 放大。

AGC 放大器的信号通过陶瓷滤波器 (CF400) 和运算放大器 (IC400 和 X53-449: IC20) 输入 AD 转换器 (X53-449: IC20)。

## CIRCUIT DESCRIPTION / 电路说明

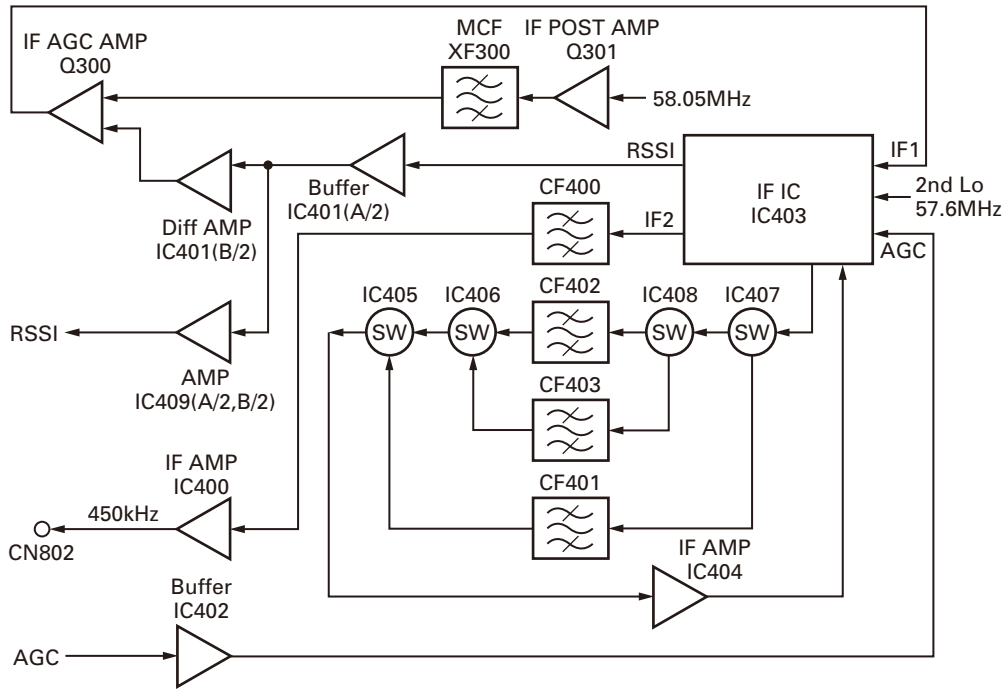


Fig. 8 IF circuit / 图 8 中频电路

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

#### ■ VCO

RX VCO circuit consists of two VCOs (VCO A X58-509: Q352, VCO B X58-509: Q353). Those VCOs generate a 1st local signal. For the VCO oscillation frequency, the 1st local signal is 341.95 to 411.95MHz. (VCO A: 341.95~376.95MHz, VCO B: 376.95~411.95MHz)

Those VCO oscillation frequency is determined by two systems of voltage control terminals "CV" and "RXASSIST".

The voltage control terminals, "CV" and "RXASSIST", are controlled by the PLL IC (X58-509: IC300) and the MCU (X53-449: IC20) and the output frequency changes continuously according to the applied voltage.

### 2-8. 接收机 PLL 电路 (SUB 单元)

#### ■ VCO

RX VCO 电路由两个 VCO (VCO A X58-509: Q352, VCO B X58-509: Q353) 组成。这些 VCO 生成第 1 本地信号。对于 VCO 振荡频率，第 1 本地信号为 341.95 到 411.95MHz。(VCO A: 341.95 ~ 376.95MHz, VCO B: 376.95 ~ 411.95MHz)

这些 VCO 振荡频率由电压控制端子的两个系统：“CV”和“RXASSIST”决定。

电压控制端子“CV”和“RXASSIST”由 PLL IC (X58-509: IC300) 和 MCU (X53-449: IC20) 控制，并根据施加的电压连续输出频率变化。

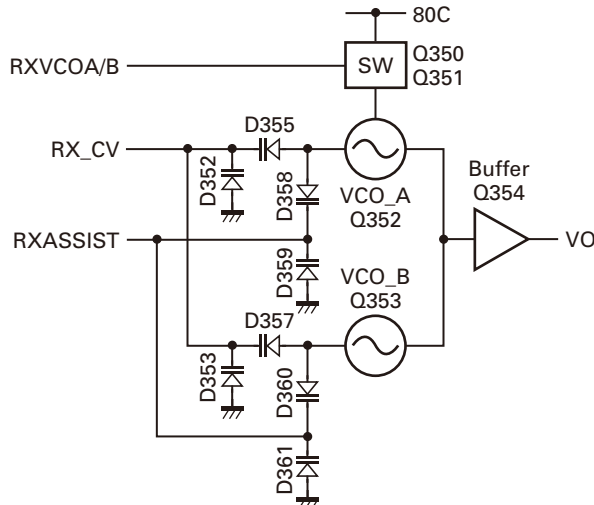


Fig. 9 Receiver VCO circuit / 图 9 接收机 VCO 电路

## CIRCUIT DESCRIPTION / 电路说明

### ■ PLL IC (X58-509: 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.

### ■ PLL IC (X58-509: IC300)

PLL IC 对比 VCO 振荡频率和 VCTCXO 基准频率的相位差，将相位差返回 VCO CV 端子，实现返回控制的“锁相环路”。这可以使 VCO 振荡频率与所需的频率精确匹配（锁定）。

频率由 PLL 控制时，频率锁定时间将随着设定频率改变时频率差的增大而增加。为对此进行补充，在由 PLL IC 控制之前使用 MCU 以使 VCO 振荡频率接近所需的频率。因此，VCO CV 的电压不变，始终稳定在约 3.0V。

PLL IC 的所需频率由 MCU (X53-449: IC20) 通过 3 线路“SPSD0”、“SPSCLK0”、“/RXPCS\_TR” 串行总线进行设定。PLL IC 锁定与否由 MCU 通过“LDR” 信号线路进行监测。如果 VCO 不是所需的频率（失锁），则“LDR” 逻辑较低。

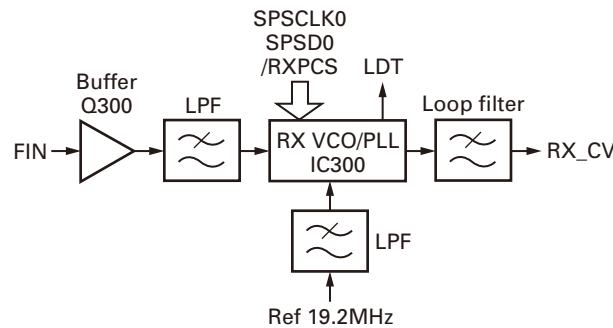


Fig. 10 Receiver PLL circuit / 图 10 接收机 PLL 电路

### 2-9. AVR circuit

The 13.6V Power Source (+B) is provided through the Connector (CN701) from the Final unit (X45-393). +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.

### 2-9. AVR 电路

13.6V 电源 (+B) 通过连接器 (CN701) 从末级单元 (X45-393) 提供。+B 连接到 FET 开关 (Q702, Q703) 和 CN700。Q702 和 Q703 由控制单元 (X53-449) 内来自 MCU 的“SBC”信号控制。如果“SBC”逻辑高，则 Q702 和 Q703 开启。由 Q702 和 Q703 开启的 13.6V 电源 (SB) 被提供到 8V AVR IC (IC702) 和 CN700。CN700 连接到控制单元 (X53-449) 以提供 +B 电源和 SB 电源。

IC702 将 8V 提供到 VCO、15V DC/DC 转换器 IC (IC701)、AVR IC (IC700) 和 FET 开关 (Q700、Q701)。IC701 是一个升压型开关稳压器。IC701 将 8V 调节到 15V，向“辅助电路”和“前端 BPF 调谐电路”提供 15V 电源。FET 开关 (Q700、Q701) 由 I/O 扩展器 IC (IC805) 控制。当 Q700 和 Q701 开启时，8V 电源提供到接收机部分。

## CIRCUIT DESCRIPTION / 电路说明

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.

IC700 将 5V 调节到 8V。IC700 的输出被提供到 FET 开关 (Q705、Q706) 和 AVR IC (IC703)。FET 开关 (Q705、Q706) 由 I/O 扩展器 IC (IC805) 控制。当 Q705 和 Q706 开启时，5V 电源提供到接收机部分、IF 部分和 IC704。IC704 将 5V 调节到 3V。3V 电源提供到混频器 IC (IC300)。IC703 将 5V 调节到 3.3V。IC703 的输出被提供到 IF 部分。

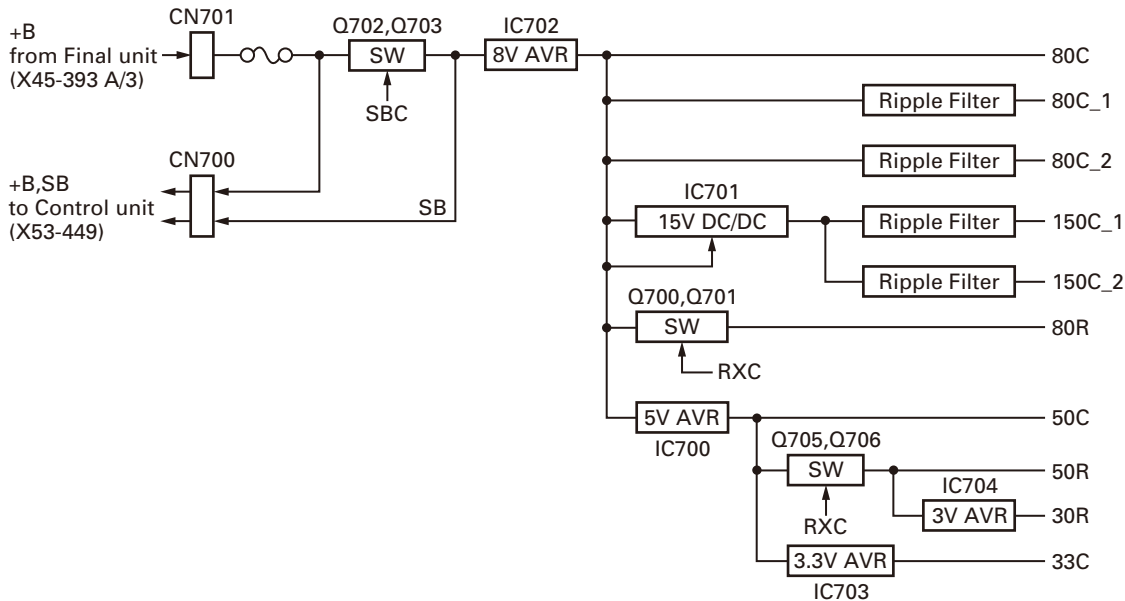


Fig. 11 AVR circuit / 图 11 AVR 电路

### 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 the 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.

### 2-10. 其他电路

#### ■ EEPROM

EEPROM (IC802) 具有 2Kbit 数据容量。它存储频率调整中的调谐数据。

#### ■ 温度传感器

温度传感器 (IC800) 监测 VCTCXO (X500) 周围的温度。

#### ■ I/O 扩展器

I/O 扩展器 IC (IC805) 控制电源、风扇、模拟开关以及发射功率控制电路。IC805 由控制单元 (X53-449) 内的 MCU 控制。

#### ■ 电子音量控制 IC

电子音量控制 IC (IC804) 调整调制信号、前端 BPF 的中心频率以及 RF 末级放大器的功率。IC804 由控制单元内的 MCU 控制。



## CIRCUIT DESCRIPTION / 电路说明

### 3. Final unit

The RF final amplifier unit (X45-393) 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 (X45-393) 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.

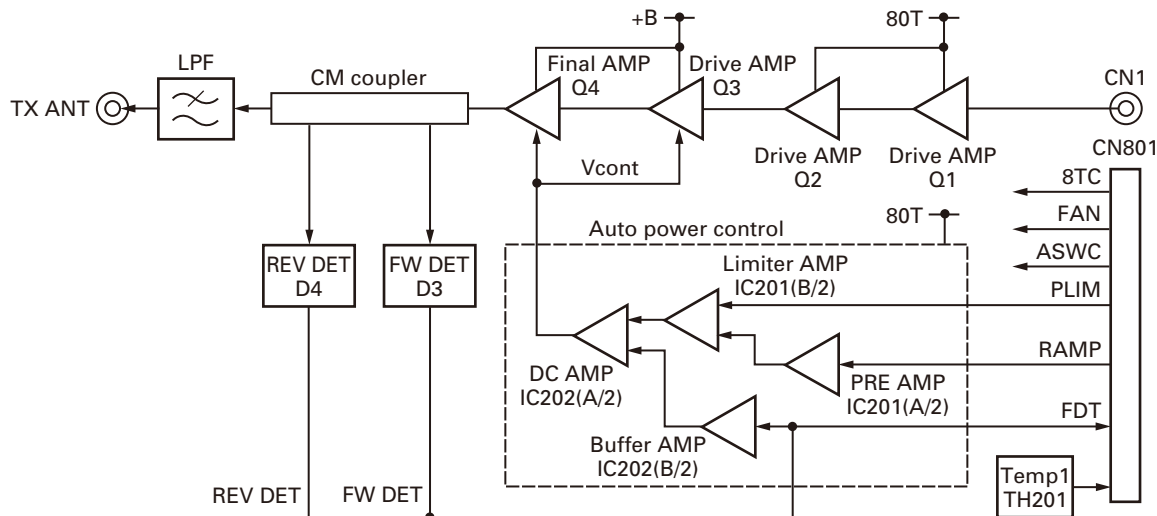


Fig. 12 Driver and Final power amplifier circuit / 图 12 驱动及末级功率放大器电路

#### 3-2. CM coupler circuit

The CM coupler circuit is a line for detecting forward wave and reflected wave. Forward wave is detected by D1, and is converted into DC voltage. If an abnormal antenna load is connected, reflected wave is detected by D3 and converted into DC voltage.

#### 3-3. Filter circuit

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

#### 3-4. APC circuit

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

### 3. 末级单元

RF 末级放大器单元 (X45-393) 将发射机功率放大到指定电平。

该单元由以下电路组成：

- (1) 驱动及末级功率放大器电路
- (2) CM 耦合电路
- (3) 滤波电路
- (4) APC 电路
- (5) 高温检测器电路
- (6) FAN 动作控制电路
- (7) AVR 电路

#### 3-1. 驱动及末级功率放大器电路

来自末级单元 (X45-393) 的 TX IN 端子 CN1 的发射信号由 Q1、Q2 和 Q3 放大，并传递到末级 Q4。由末级 Q4 放大的信号通过 CM 耦合电路和滤波电路，然后被送到天线。

#### 3-2. CM 耦合电路

CM 是一条用于检测前向波和反射波的线路。前向波由 D1 检测，并转换为 DC 电压。如果连接了异常天线负载，反射波由 D3 检测并转换为 DC 电压。

#### 3-3. 滤波电路

该电路从发射机输出中消除谐波，并将滤波的信号发送到天线。

#### 3-4. APC 电路

自动发射功率控制 (APC) 电路将发射机输出功率稳定在预定的电平。CM 耦合电路的 DC 电压由 DC 放大器 IC202 (1/2) 放大。IC202 (2/2) 将 MCU (X53-449) 和 DC 放大器 IC201 (1/2, 2/2) 产生的 APC 控制电压 (RAMP) 与 IC202 (1/2) 的输出电压进行比较，以控制放大器 Q3 和末级放大器 Q4 的栅电压。

## CIRCUIT DESCRIPTION / 电路说明

### 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).

### 3-5. 高温检测器电路

为防止毁坏放大器 Q3 和末级放大器 Q4，该电路在放大器 Q3 和末级放大器 Q4 的温度升高时降低 APC 控制电压 (RAMP)。MCU 用热敏电阻 (TH201) 检测温度并控制 APC 电压 (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.

### 3-6. FAN 动作控制电路

FAN 动作控制电路由 FAN 和开关晶体管 Q207 组成。它由 MCU (X53-449) 控制。如果把 FAN 动作设为 "Temperature (温度)", 冷却风扇将根据温度开启或关闭。如果把 FAN 动作设为 "Continuous (连续)", 冷却风扇将连续运行, 但 Q207 将保持开启状态。

### 3-7. AVR circuit

The 13.6V power source (+B) is provided through connector CN201 to the Final unit (X45-393 A/3). +B is connected to CN203 to supply the 13.6V power source for the TX-RX unit (X57-795). +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 (X57-795). 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 (X57-795). If "ASWC" logic is high, Q203 and Q205 turn on and supply the 8V power source to the antenna switch circuit.

### 3-7. AVR 电路

13.6V 电源 (+B) 通过连接器 CN201 提供到末级单元 (X45-393 A/3)。+B 连接到 CN203, 为 TX-RX 单元 (X57-795) 提供 13.6V 电源。+B 是 "末级放大器"、"驱动放大器" 和风扇的电源。IC203 将 +B 电压调节到 8V。该 8V 电源连接到 FET 开关 Q203、Q204、Q205 和 Q206。Q204 和 Q206 由 TX-RX 单元 (X57-795) 内 I/O 扩展器 IC 的 "8TC" 信号控制。如果 "8TC" 逻辑高, Q204 和 Q206 开启, 并向 APC 电路和预驱动放大器提供 8V 电源。Q203 和 Q205 由 TX-RX 单元 (X57-795) 内 I/O 扩展器 IC 的 "ASWC" 信号控制。如果 "ASWC" 逻辑高, Q203 和 Q205 开启, 并向天线开关电路提供 8V 电源。

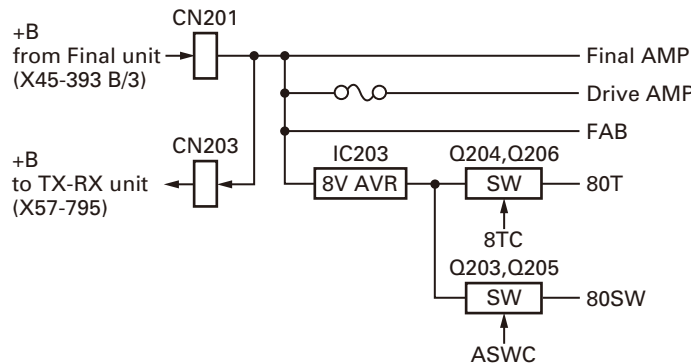


Fig. 13 AVR circuit / 图 13 AVR 电路

## 4. Control unit

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

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

## 4. 控制单元

控制单元 (X53-449) 由以下电路组成:

- (1) MCU 电路
- (2) 存储电路
- (3) DSP 电路
- (4) 静噪电路
- (5) 电源电路
- (6) 电源电压监测电路
- (7) 18.432MHz 时钟电路
- (8) 音频电路
- (9) 其他电路

## CIRCUIT DESCRIPTION / 电路说明

### 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.

### 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

### 4-1. MCU 电路

MCU (IC20) 是一个 32 位 RISC 处理器，具备外围功能和 ADC/DAC。

该 MCU 以 18.432MHz 时钟和 3.3V/1.5V DC 运行。

它控制闪存、SRAM、DSP、接收电路、发射电路以及控制电路。

### 4-2. 存储电路

存储电路由 MCU (IC20)、SRAM (IC9) 和闪存 (IC3) 组成。

闪存具有 32Mbit 的容量，包含 MCU 的中继台控制程序并储存数据。它也保存中继台信道的数据和由 FPU 写入的操作参数。此程序很容易从外部设备写入。

SRAM 具有 1Mbit 的容量，包含工作区和数据区。

#### ■ 闪存

**注意：**闪存存储 FPU 写入的数据、调谐数据（频偏、静噪等）以及固件程序。

#### ■ SRAM (静态存储器)

**注意：**SRAM 含有临时数据区和工作区。当电源关闭时，则以内部二次锂电池作为后备电源。因此，保存的数据不会丢失。

### 4-3. DSP 电路

DSP 电路由 DSP (IC6) 组成，可处理基带信号。DSP 在 18.432MHz 的外部时钟上运行（与 IC20 相同）。I/O 部分以 3.3V 运行，核心部分以 1.6V 运行。DSP 执行以下处理：

#### ■ 数字处理

- 4 级 FSK 和基带滤波处理
- 音频编解码器和调制 / 解调之间的声码器处理
- CAI 处理，例如纠错编码 / 解码和交错
- AFC 环路控制
- 帧同步和时间跟踪
- 数据扰频

#### ■ 模拟 FM 处理

- 预加重 / 去加重
- QT/DQT 编码 / 解码
- DTMF 编码 / 解码
- 压缩器 / 扩展器处理
- 语音扰频器处理

#### ■ 音频或调制功能

- 发射 / 接收音频滤波处理
- 麦克风放大器 AGC 处理
- 音频软静音处理
- 调制电平处理
- 静噪滤波

## CIRCUIT DESCRIPTION / 电路说明

### ■ Other function

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

### ■ 其他功能

- 表决音
- CWID
- 礼貌音
- 中继台运行
- 模拟 / 数字混合模式

### 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.

### 4-4. 静噪电路

通过BPF电路滤波后,静噪电路放大IC6的已解调噪音信号。经过处理的数字噪音信号施加于CODEC IC14,从数字转换为模拟。随后,放大的信号由检测电路转换为DC信号。转换的信号被反馈到IC20。

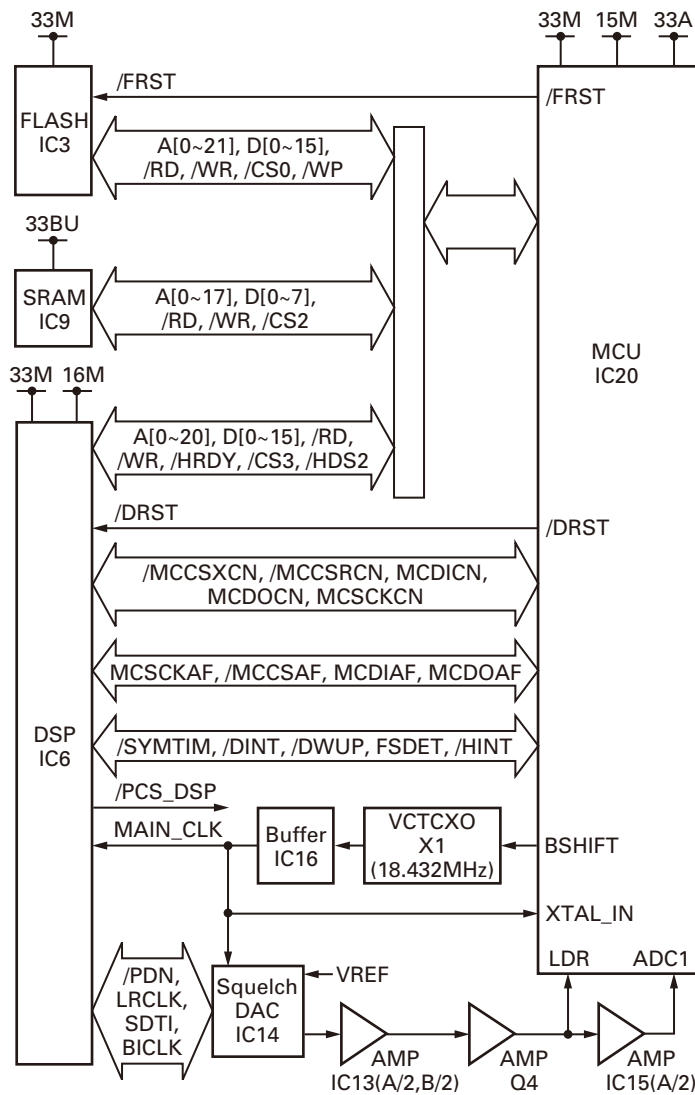


Fig. 14 Control circuit / 图 14 控制电路

## CIRCUIT DESCRIPTION / 电路说明

### 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 (X57-795).

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.

### 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.

### 4-5. 电源电路

X53-449 电路由 IC301、IC302、IC303、IC304、IC305 和 IC306 组成。

IC301 是将 13.6V 转换为 6.0V 的 DC/DC 转换器。该 13.6V 电压从 TX-RX 单元 (X57-795) 提供。

IC302 连接到 IC301 并将电压调节到 5.0V。IC303、IC304、IC305 和 IC306 连接到 IC301。IC303 和 IC306 是 3.3V 稳压器。IC304 是 1.5V 稳压器 IC，IC305 是 1.6V 稳压器 IC。

CN302 是锂电池的连接器。锂电池用于在无法使用外部 DC 电源时备份 SRAM 和 RTC 数据。

### 4-6. 电源电压监测电路

X53-449 电路由 IC307、IC308、D303 和 Q301 组成。

IC308 是电压检测 IC，用于产生 MCU (IC20) 的 "/RST" 信号。该 "/RST" 信号连接到 MCU (IC20) 的硬件复位引脚。

IC307 是电压检测 IC，用于产生 MCU (IC20) 的 "/BINT" 信号。该 "/BINT" 信号连接到 MCU (IC20) 的硬件中断引脚。MCU (IC20) 的软件运行到休眠模式以使用 "/BINT" 信号。

D303 和 Q301 用于产生 MCU (IC20) 的 "OVRB" 信号。MCU (IC20) 的软件运行到休眠模式以使用 "OVRB" 信号。

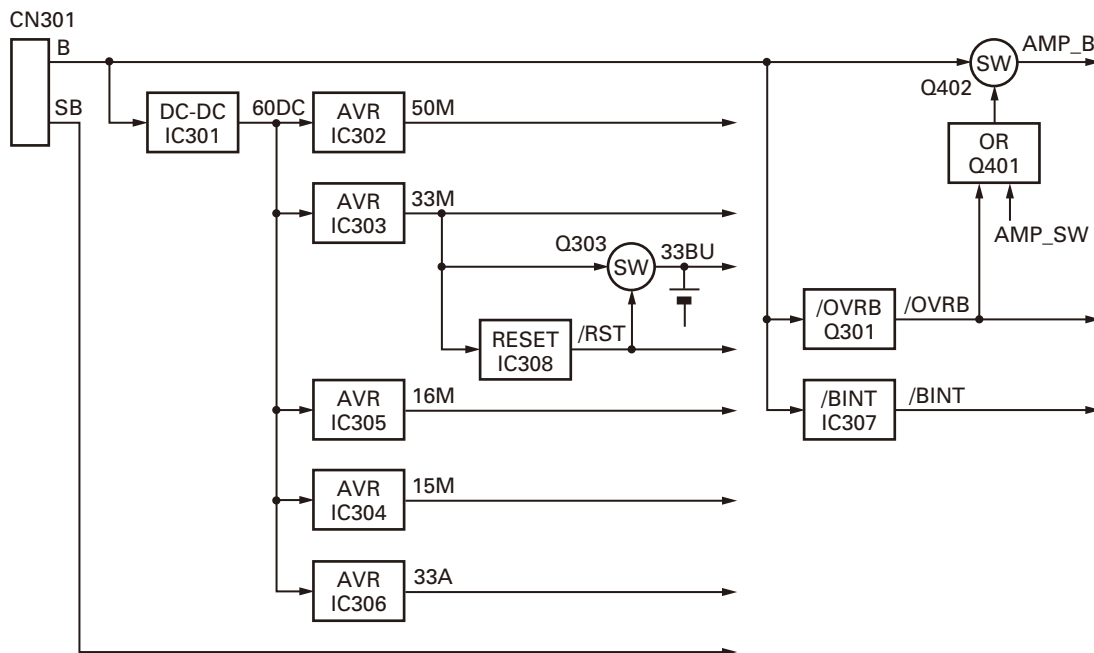


Fig. 15 Power supply circuit / 图 15 电源电路

## CIRCUIT DESCRIPTION / 电路说明

### 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 pin15 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 (X54-373 A/2) so that it may not saturate. This circuit consists of IC501, D501, D502, Q501, and Q502. The AGC controls the amplifier gains using the detected audio signal depending on the positive and negative peaks of the signal amplitude. The audio signal goes to the control section of the Control unit (X53-449) from the Display unit (X54-373 A/2).

### 4-7. 18.432MHz 时钟电路

18.432MHz 时钟提供到 MCU (IC20)、DSP (IC6) 以及静音电路的 DAC (IC14)。

### 4-8. 音频电路

#### ■ 音频放大器电路

音频放大器电路位于控制单元 (X53-449) 的控制部分。在电源电压 13.6V、负载 4Ω 的情况下，从后面板上的引脚 15 TEST/SPKR 连接器 "SPO, SPG" 到外部扬声器可获得 4W 输出音频功率。

#### ■ 麦克风电路

麦克风的信号通过位于显示单元 (X54-373 A/2) 内的 AGC 电路，因此它不会饱和。该电路由 IC501、D501、D502、Q501 和 Q502 组成。AGC 利用检测的音频信号，根据信号幅度的正负峰值控制放大器增益。音频信号从显示单元 (X54-373 A/2) 进入控制单元 (X53-449) 的控制部分。

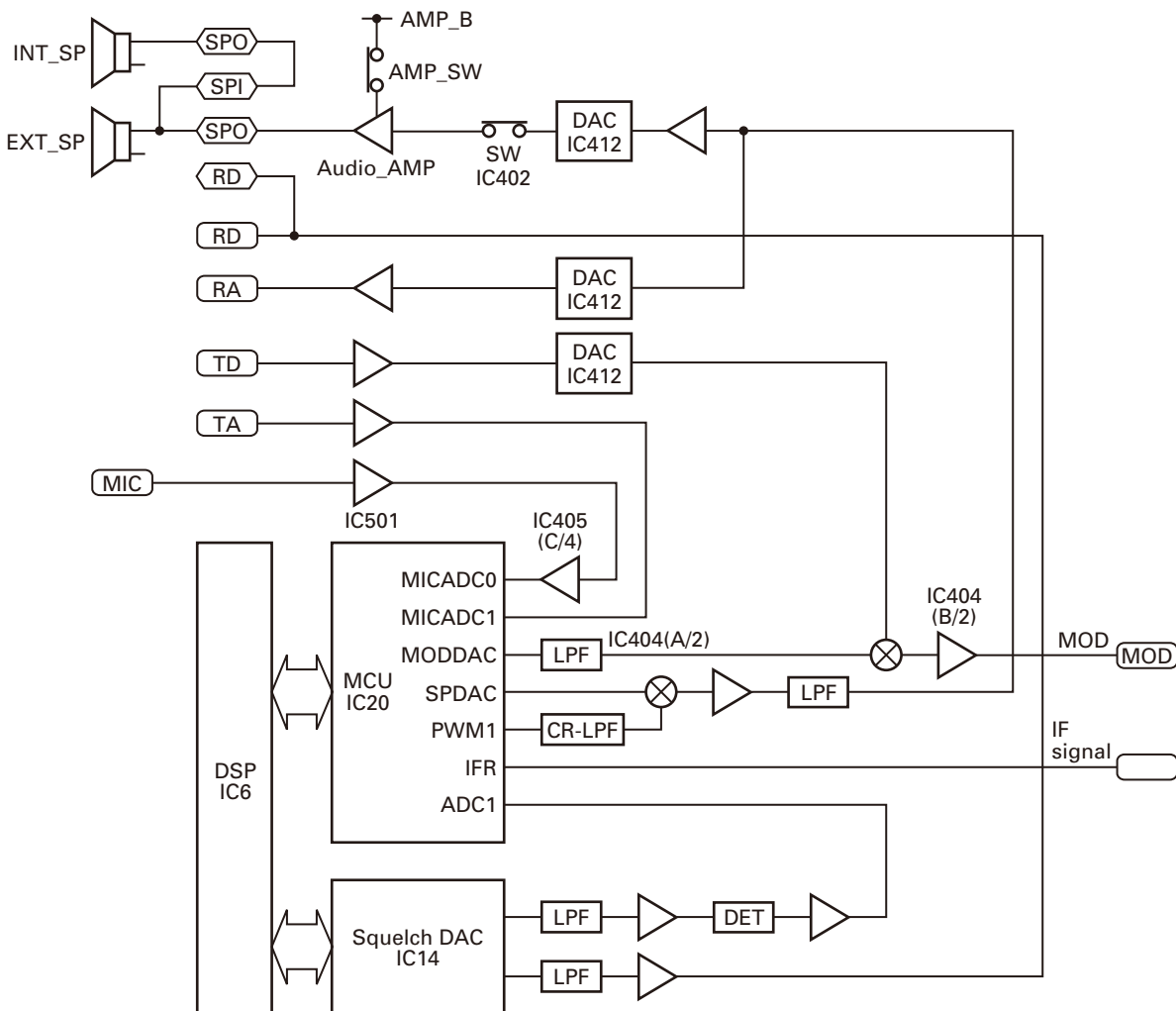


Fig. 16 Modulation circuit (Analog/Digital signal processing) / 图 16 解调电路 (模拟 / 数字信号处理)

## CIRCUIT DESCRIPTION / 电路说明

### ■ 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.

## 5. Display unit

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

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

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

### 5-1. LED circuit

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

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

### 5-2. Key switch circuit

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

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

### 5-3. Power supply voltage detector

The Display unit has a power supply voltage detector circuit.

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

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

### ■解调电路（模拟 / 数字信号处理）

在模拟信号处理模式下，发射音频信号由 IC405 (C/4) 放大，输入到 MCU (IC20) 的 MICADCO 端子，由 DSP (IC6) 处理音频。IC20 的 MODDAC 端子的经过处理的音频信号通过 IC404 (A/2) 的抗混叠滤波器，然后由 IC404 (B/2) 放大到足够的电平，并由加法 (TD) 放大器放大。数字信号处理模式与模拟信号处理模式相同。

### 4-9. 其他电路

#### ■实时时钟

时钟功能以实时时钟 IC (IC17) 为基础。当电源关闭时，则以内部二次锂电池作为后备电源。

## 5. 显示单元

显示单元 (X54-3730-20) 不同于 TKR-750/850/751/851 中使用的 X54-3580-20。

显示单元 (X54-3730-20) 由以下电路组成：

- (1) LED 电路
- (2) 键开关电路
- (3) 电源电压检测器

### 5-1. LED 电路

显示电路包含多种类型的 LED：

7 段式 D506 和 D507 (红色)、D503 (红色：发射)、D504 (绿色：繁忙)、D505 (绿色：打开电源)。

IC502 到 IC505 是将 MCU 串行信号转换为并行数据并打开 LED 的移位寄存器。

### 5-2. 键开关电路

显示单元上有 PF 键 1 到 PF 键 6。使用这些键开关，可以进行模式设定。

按这些键开关的逻辑信号被直接输入 MCU (IC20)。

### 5-3. 电源电压检测器

显示单元具有电源电压检测电路。

电源电压 (SB) 通过两个电阻器 (R545 和 R546) 进行划分。划分的电压经由 IC508 输入到 MCU。

# NXR-810

## COMPONENTS DESCRIPTION / 元件说明

### FINAL UNIT (X45-3932-71)

Ref. No.	Part Name	Description
IC201,202	IC	DC amplifier
IC203	IC	Voltage regulator
Q1	Transistor	RF amplifier
Q2	FET	RF amplifier
Q3	FET	TX drive amplifier
Q4	FET	Final amplifier
Q203~206	FET	DC switch
Q207	Transistor	DC switch
D1~3	Diode	RF detector
D4~7	Diode	RF switch
D8	Surge absorber	Surge protection
D201	Zener diode	Voltage reference
D202	Surge absorber	Surge protector
D203	Diode	Surge protector
D301	Diode	Protect of reverse connection

### 末级单元 (X45-3932-71)

有关号码	零件名称	说明
IC201, 202	IC	DC 放大器
IC203	IC	稳压器
Q1	晶体管	RF 放大器
Q2	场效应管	RF 放大器
Q3	场效应管	TX 驱动放大器
Q4	场效应管	末级放大器
Q203~206	场效应管	DC 开关
Q207	晶体管	DC 开关
D1~3	二极管	RF 检测器
D4~7	二极管	RF 开关
D8	电涌吸收	电涌保护
D201	稳压二极管	电压基准
D202	电涌吸收	电涌保护器
D203	二极管	电涌保护器
D301	二极管	逆向连接保护

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

Ref. No.	Part Name	Description
IC3	IC	Flash memory
IC4,5	IC	RS-485 transceiver
IC6	IC	DSP
IC7,8	IC	Buffer
IC9	IC	SRAM
IC10,11	IC	Buffer
IC12	IC	AND gate
IC13	IC	AF amplifier
IC14	IC	CODEC
IC15	IC	AF amplifier
IC16	IC	Buffer amplifier
IC17	IC	RTC IC
IC18,19	IC	Buffer
IC20	IC	MCU
IC21	IC	RS-232C driver/receiver
IC22	IC	I/O expander
IC23	IC	NAND gate
IC24	IC	AND gate
IC25	IC	OR gate
IC26	IC	AND gate
IC27,28	IC	AF amplifier
IC301	IC	DC/DC converter
IC302~308	IC	Voltage regulator
IC401	IC	NAND gate
IC402	IC	Analog switch
IC403	IC	AF power amplifier

### 控制单元 (X53-4490-10)

有关号码	零件名称	说明
IC3	IC	闪存
IC4, 5	IC	RS-485 中继台
IC6	IC	DSP
IC7, 8	IC	缓冲器
IC9	IC	SRAM
IC10, 11	IC	缓冲器
IC12	IC	AND 栅
IC13	IC	AF 放大器
IC14	IC	CODEC
IC15	IC	AF 放大器
IC16	IC	缓冲放大器
IC17	IC	RTC IC
IC18, 19	IC	缓冲器
IC20	IC	MCU
IC21	IC	RS-232C 驱动器 / 接收机
IC22	IC	I/O 扩展器
IC23	IC	NAND 栅
IC24	IC	AND 栅
IC25	IC	OR 栅
IC26	IC	AND 栅
IC27, 28	IC	AF 放大器
IC301	IC	DC/DC 转换器
IC302~308	IC	稳压器
IC401	IC	NAND 栅
IC402	IC	模拟开关
IC403	IC	AF 功率放大器



## COMPONENTS DESCRIPTION / 元件说明

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

## DISPLAY UNIT (X54-3730-20)

Ref. No.	Part Name	Description
IC501	IC	MIC amplifier
IC502~505	IC	Shift register
IC506,507	IC	Voltage regulator
IC508	IC	Analog switch
Q501,502	Transistor	Level controller
Q503,504	FET	DC switch
Q506	Transistor	DC switch
Q507	FET	DC switch

有关号码	零件名称	说明
IC404~406	IC	OP AMP
IC407	IC	模拟开关
IC411	IC	OP AMP
IC412	IC	DC/AC 转换器
Q4	晶体管	DC 开关
Q5	场效应管	DC 开关
Q6~10	晶体管	缓冲放大器
Q301	晶体管	DC 开关
Q302	场效应管	DC 开关
Q303	晶体管	电源开关
Q401	晶体管	电源开关
Q402	场效应管	电源开关
Q403	晶体管	电源开关
Q404, 405	晶体管	AF 静音开关
D1, 2	二极管	检测器
D3~12	二极管	电涌保护器
D13	稳压二极管	电涌保护器
D14~16	二极管	电涌保护器
D18	二极管	电涌保护器
D20	二极管	电涌保护器
D22, 23	二极管	电涌保护器
D24	稳压二极管	电涌保护器
D26	二极管	电涌保护器
D28, 29	二极管	电涌保护器
D30	稳压二极管	电涌保护器
D31	二极管	电涌保护器
D32	稳压二极管	电涌保护器
D35	二极管	电涌保护器
D36	稳压二极管	电涌保护器
D37	变阻器	电流保护器
D301, 302	二极管	电涌保护器
D303	稳压二极管	电压基准
D304, 305	二极管	电涌保护器
D401	二极管	二极管开关

## 显示单元 (X54-3730-20)

有关号码	零件名称	说明
IC501	IC	MIC 放大器
IC502~505	IC	移位寄存器
IC506, 507	IC	稳压器
IC508	IC	模拟开关
Q501, 502	晶体管	电平控制器
Q503, 504	场效应管	DC 开关
Q506	晶体管	DC 开关
Q507	场效应管	DC 开关

# NXR-810

## COMPONENTS DESCRIPTION / 元件说明

Ref. No.	Part Name	Description
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
D503~505	LED	LED
D506,507	LED	7 segment
D508~514	Diode	Surge absorption
D601,602	Diode	Surge absorption
D603	Varistor	Current protector

有关号码	零件名称	说明
Q508~511	晶体管	DC 开关
Q512~514	场效应管	DC 开关
Q516~519	场效应管	DC 开关
Q521~525	场效应管	DC 开关
D501, 502	二极管	AF 检测器
D503~505	LED	LED
D506, 507	LED	7 段
D508~514	二极管	电涌吸收
D601, 602	二极管	电涌吸收
D603	变阻器	电流保护器

### TX-RX UNIT (X57-7952-71)

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

### TX-RX 单元 (X57-7952-71)

有关号码	零件名称	说明
IC100, 101	IC	OP AMP
IC200, 201	IC	OP AMP
IC203	IC	缓冲器
IC300	IC	混频器
IC400	IC	IF 放大器
IC401	IC	缓冲放大器
IC402	IC	OP AMP
IC403	IC	IF 系统
IC404	IC	IF 放大器
IC405~408	IC	模拟开关
IC409	IC	缓冲放大器
IC500	IC	缓冲放大器
IC501	IC	OP AMP
IC600, 601	IC	缓冲器
IC602	IC	16.8MHz PLL
IC603~607	IC	OP AMP
IC608	IC	AF 放大器
IC700~702	IC	稳压器
IC703, 704	IC	稳压器
IC800	IC	温度传感器
IC801	IC	OP AMP
IC802	IC	EEPROM
IC803	IC	缓冲放大器
IC804	IC	数字电位计
IC805	IC	I/O 扩展器
IC806	IC	模拟开关
Q100	晶体管	DC 开关
Q101	晶体管	RF 放大器
Q200, 201	晶体管	DC 开关
Q202, 203	晶体管	RF 放大器
Q300	场效应管	RF 放大器
Q301	晶体管	RF 放大器

## COMPONENTS DESCRIPTION / 元件说明

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

有关号码	零件名称	说明
Q500	场效应管	DC 开关
Q501	晶体管	RF 放大器
Q502, 503	场效应管	RF 放大器
Q504	晶体管	RF 放大器
Q505~507	场效应管	DC 开关
Q600	场效应管	DC 开关
Q601	晶体管	DC 开关
Q602, 603	晶体管	RF 放大器
Q604, 605	晶体管	DC 开关
Q606	晶体管	RF 放大器
Q607	场效应管	DC 开关
Q700~702	场效应管	DC 开关
Q703	晶体管	DC 开关
Q704~706	场效应管	DC 开关
Q800	场效应管	DC 开关
D100, 101	可变电容二极管	频率控制
D103~108	可变电容二极管	频率控制
D200	二极管	DC 开关
D500, 501	稳压二极管	限幅器
D503	二极管	检测器
D504, 505	二极管	RF 开关
D600	二极管	DC 开关
D601	二极管	RF 开关
D801	二极管	DC 开关

## RX VCO/PLL UNIT (X58-5090-10)

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

## RX VCO/PLL 单元 (X58-5090-10)

有关号码	零件名称	说明
IC300	IC	PLL
Q300	晶体管	缓冲放大器
Q350, 351	场效应管	DC 开关
Q352, 353	场效应管	VCO OSC
Q354	晶体管	缓冲放大器
D352, 353	可变电容二极管	频率控制
D355	可变电容二极管	频率控制
D357~361	可变电容二极管	频率控制

## TX VCO/PLL UNIT (X58-5100-10)

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 单元 (X58-5100-10)

有关号码	零件名称	说明
IC300	IC	PLL
Q300	晶体管	缓冲放大器
Q350, 351	场效应管	DC 开关
Q352, 353	场效应管	VCO OSC
Q354	晶体管	缓冲放大器
D352, 353	可变电容二极管	频率控制
D355	可变电容二极管	频率控制
D357~361	可变电容二极管	频率控制

# NXR-810

## PARTS LIST / 零件表

\* New Parts. Δ indicates safety critical components.

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

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

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

L : Scandinavia

Y : PX (Far East, Hawaii)

C : China

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

### NXR-810

#### FINAL UNIT (X45-3932-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination
<b>NXR-810</b>					
1	3A		A62-0933-23	PANEL ASSY (INNER)	
2	1A		A62-1146-04	PANEL (TX-RX)	
3	1B		A62-1147-04	PANEL (FINAL)	
4	1D		A62-1148-03	PANEL (OUTER)	
5	3C		A62-1174-03	PANEL ASSY	
6	2C		A82-0077-02	REAR PANEL	
8	1F		B10-2635-04	FRONT GLASS ACCESSORY	
9	1F		B11-1259-04	FILTER ACCESSORY	
10	1F	*	B62-2201-00	INSTRUCTION MANUAL	
11	2C,3D	*	B72-2604-14	MODEL NAME-PLATE	
13	1B		E30-3414-05	DC CORD (EXT DC IN)	
14	1C		E30-3418-15	ANTENNA CABLE (RX IN)	
15	1E		E30-3427-35	DC CORD ACCESSORY	
16	1D		E30-7528-15	ANTENNA CABLE (TX OUT)	
17	1A		E30-7689-05	TRUNK CABLE (X57-X53)	
18	1C		E30-7690-05	ANTENNA CABLE (REF IN)	
19	1E		E31-3228-05	15P PLUG ACCESSORY	
20	1B		E37-0902-15	LEAD WIRE WITH TERMINAL (DC+)	
21	1B		E37-0903-15	LEAD WIRE WITH TERMINAL (DC-)	
22	3A		E37-0905-15	LEAD WIRE WITH CONNECTOR (SP)	
23	3A		E37-0906-05	LEAD WIRE WITH CONNECTOR (X53-X54)	
24	3A,2B		E37-0908-05	LEAD WIRE WITH CONNECTOR (11P)	
25	3A,1B		E37-0911-05	LEAD WIRE WITH CONNECTOR (3P)	
26	2B		E37-0912-15	LEAD WIRE WITH MINIPIN PLUG	
27	2C		E37-0913-05	LEAD WIRE WITH CONNECTOR (ACC15P)	
28	2A		E37-1340-25	FLAT CABLE	
29	2C		E37-1376-05	LEAD WIRE WITH CONNECTOR (DSUB25P)	
32	1C,1E		F05-1537-05	BLADE FUSE (15A/32V) ACCESSORY	
33	2C		F09-0445-05	CAP (DSUB)	
34	1C		F09-0471-15	FANMOTOR	
35	1B		F10-3129-03	SHIELDING CASE (X45 FINAL PCB)	
36	1B	*	F10-3143-02	SHIELDING PLATE (X45 FINAL PCB)	
37	2A,2B		G02-0576-14	FLAT SPRING	
38	2B		G02-0829-14	FLAT SPRING (RX VCO)	
39	3A		G02-0885-13	EARTH SPRING (X54 DISPLAY PCB)	
40	1B		G02-0894-04	EARTH SPRING (X45:FINAL FET)	
41	2B		G02-1831-04	EARTH SPRING (REAR BOTTOM)	
42	1C		G02-1832-04	EARTH SPRING (REAR TOP)	
43	1B		G02-1855-04	FLAT SPRING (X45:AVR)	
44	2B,3B		G10-1263-04	FIBROUS SHEET (CHASSIS)	
45	3C,2D		G10-1264-04	FIBROUS SHEET (PANEL ASSY)	
46	3B		G10-1344-04	FIBROUS SHEET (EARTH SPRING,SHORT)	
47	3B		G10-1345-04	FIBROUS SHEET (EARTH SPRING,LONG)	
48	3A		G10-1377-04	FIBROUS SHEET (VOLUME)	
49	3A	*	G10-1821-04	FIBROUS SHEET (KNOB)	
50	1F		G13-1801-04	CUSHION (40X40X5) ACCESSORY	
51	1F		G13-1802-04	CUSHION (40X40X10) ACCESSORY	
52	2B	*	G13-1877-15	CONDUCTIVE CUSHION	
53	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)	

Ref. No.	Address	New parts	Parts No.	Description	Destination
57	1F		H25-2328-04	PROTECTION BAG (80/250/0.07)	
58	3F	*	H52-2389-02	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	
66	1E		J59-0302-05	GROMMET ACCESSORY	
67	1B,1E		J61-0307-05	BAND	
69	1E		K01-0418-15	HANDLE ACCESSORY	
70	3A		K29-5389-03	KNOB (VOLUME)	
71	3A		K29-9106-04	KNOB (POWER)	
72	3A		K29-9370-02	KEY TOP	
74	1E		L79-1419-05	LINE FILTER (ACCESSORY DC CORD)	
75	1B		L79-1854-05	LINE FILTER (DC CORD,DC+,DC-)	
76	1B		L79-1855-05	LINE FILTER (DC+,DC-)	
A	2C		N09-2292-05	HEXAGON HEAD SCREW (DSUB)	
B	1C,2C,2D		N30-2606-48	PAN HEAD MACHINE SCREW (ANT)	
C	2A,1E		N30-4006-48	PAN HEAD MACHINE SCREW (CHAS,ACC)	
D	2B,2C		N30-4014-48	PAN HEAD MACHINE SCREW (CHASSIS)	
E	1C		N30-4020-43	PAN HEAD MACHINE SCREW (FAN)	
F	1C,2C		N32-3006-48	FLAT HEAD MACHINE SCREW (R PANEL)	
G	3B		N32-4008-43	FLAT HEAD MACHINE SCREW (F PANEL)	
H	1A,1B,1E		N35-3006-43	BINDING HEAD MACHINE SCREW (TOP,ACC)	
J	1C		N35-4006-43	BINDING HEAD MACHINE SCREW (TOP)	
K	1B,3B		N67-3008-48	PAN HEAD SEMS SCREW (X53:AUDIO IC)	
L	1C,2C		N80-2608-43	PAN HEAD TAPTITE SCREW (FUSE)	
M	3A		N87-3005-43	BRAZIER HEAD TAPTITE SCREW (SP)	
N	3A,1B,2B		N87-3006-48	BRAZIER HEAD TAPTITE SCREW (PCB)	
78	3A		T07-0770-45	SPEAKER	
80	3A		W09-0971-05	LITHIUM CELL	
-			X53-4490-11	SERVICE CONTROL UNIT	
-			490-0174-05	ADHESIVE TAPE	
<b>FINAL UNIT (X45-3932-71)</b>					
C1			CK73GB1H471K	CHIP C 470PF	K
C2			CC73GCH1H060D	CHIP C 6.0PF	D
C3			CK73GB1H471K	CHIP C 470PF	K
C4			CK73GB1H104K	CHIP C 0.10UF	K
C5,6			CK73GB1H471K	CHIP C 470PF	K
C8			CK73GB1H471K	CHIP C 470PF	K
C9			CC73GCH1H080D	CHIP C 8.0PF	D
C10			CC73GCH1H120J	CHIP C 12PF	J
C12			CK73GB1H471K	CHIP C 470PF	K
C13,14			CK73GB1H104K	CHIP C 0.10UF	K
C16-18			CK73GB1H471K	CHIP C 470PF	K
C20			CK73FB1H471K	CHIP C 470PF	K
C22			CC73FCH1H120J	CHIP C 12PF	J
C23			CK73FB1H471K	CHIP C 470PF	K
C24-26			CC73GCH1H470J	CHIP C 47PF	J

## PARTS LIST / 零件表

FINAL UNIT (X45-3932-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C27,28			CC73FCH1H060B	CHIP C 6.0PF B		C240			CK73GB1H104K	CHIP C 0.10UF K	
C29			C93-0566-05	CHIP C 33PF J		C241,242			CK73GB1H471K	CHIP C 470PF K	
C31			C93-0599-05	CHIP C 470PF K		C244-247			CK73GB1H471K	CHIP C 470PF K	
C32			CK73GB1H471K	CHIP C 470PF K		C301			CC73GCH1H470J	CHIP C 47PF J	
C33			C93-0599-05	CHIP C 470PF K		C302			CC73GCH1H220J	CHIP C 22PF J	
C34			CC73GCH1H101J	CHIP C 100PF J		C303			CC73GCH1H150J	CHIP C 15PF J	
C35			CC73FCH1H470J	CHIP C 47PF J		C304			CC73GCH1H101J	CHIP C 100PF J	
C36			C93-1792-05	CHIP C 39PF J		101	2C		E37-1473-05	LEAD WIRE WITH CONNECTOR (X45-X53)	
C37			CK73GB1H104K	CHIP C 0.10UF K		CN1			E04-0154-05	PIN SOCKET	
C40			CK73GB1H471K	CHIP C 470PF K		CN3			E23-1262-05	TERMINAL	
C41			CC73GCH1H220J	CHIP C 22PF J		CN4-7			E23-1330-05	TERMINAL	
C42			C93-1792-05	CHIP C 39PF J		CN8-10			E23-1262-05	TERMINAL	
C43			C93-0599-05	CHIP C 470PF K		CN11			E23-1330-05	TERMINAL	
C44			CC73GCH1H820J	CHIP C 82PF J		CN201,202			E23-0462-05	TERMINAL	
C45			C93-1792-05	CHIP C 39PF J		CN203			E41-2672-05	PIN ASSY	
C48			C93-1789-05	CHIP C 30PF J		CN204			E41-2743-05	PIN ASSY	
C49			CC73GCH1H101J	CHIP C 100PF J		CN205			E41-1682-05	PIN ASSY	
C50			C93-0599-05	CHIP C 470PF K		J401,402			E58-0533-05	MODULAR JACK	
C51			C93-1788-05	CHIP C 27PF J		F1			F53-0392-05	FUSE (3A)	
C52			CK73GB1H104K	CHIP C 0.10UF K		102	1B		G02-1856-04	EARTH SPRING	
C53			CC73FCH1H050C	CHIP C 5.0PF C		103	2C		J21-8616-04	MOUNTING HARDWARE (MODULAR)	
C54			C93-1782-05	CHIP C 15PF J		CN301			J13-0071-05	FUSE HOLDER	
C56			C93-1778-05	CHIP C 10PF J		L1			L41-1578-14	SMALL FIXED INDUCTOR (15NH)	
C57			CC73GCH1H220J	CHIP C 22PF J		L2			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)	
C58			C93-1768-05	CHIP C 6PF C		L3			L41-1578-14	SMALL FIXED INDUCTOR (15NH)	
C60			CC73GCH1H820J	CHIP C 82PF J		L4			L34-4604-15	AIR-CORE COIL	
C61			C93-0572-05	CHIP C 100PF J		L5			L34-4556-05	AIR-CORE COIL	
C62			CK73GB1H471K	CHIP C 470PF K		L6			L34-4520-05	AIR-CORE COIL	
C67			C93-0599-05	CHIP C 470PF K		L7,8			L41-1085-14	SMALL FIXED INDUCTOR (100NH)	
C68			CK73GB1H471K	CHIP C 470PF K		L9			L34-4667-05	AIR-CORE COIL	
C74			CK73GB1H471K	CHIP C 470PF K		L10			L34-4758-05	AIR-CORE COIL	
C76			C93-0572-05	CHIP C 100PF J		L11-13			L34-4517-05	AIR-CORE COIL	
C77			CC73FCH1H030B	CHIP C 3.0PF B		L14			L41-4763-14	SMALL FIXED INDUCTOR (4.7NH)	
C79,80			C93-0551-05	CHIP C 1.5PF C		L15			L92-0179-05	CHIP FERRITE	
C82			C93-0554-05	CHIP C 4.0PF C		R1			RK73GB2A181J	CHIP R 180 J 1/10W	
C86			C93-1776-05	CHIP C 9PF C		R2			RK73GB2A270J	CHIP R 27 J 1/10W	
C87			CK73GB1H471K	CHIP C 470PF K		R3			RK73GB2A181J	CHIP R 180 J 1/10W	
C89			C93-1778-05	CHIP C 10PF J		R4			RK73FB2B151J	CHIP R 150 J 1/8W	
C91			C93-0553-05	CHIP C 3.0PF C		R5			RK73GB2A392J	CHIP R 3.9K J 1/10W	
C92			C93-0562-05	CHIP C 15PF J		R6			RK73GB2A332J	CHIP R 3.3K J 1/10W	
C201			CK73GB1H471K	CHIP C 470PF K		R7			RK73GB2A221J	CHIP R 220 J 1/10W	
C204			CK73GB1H471K	CHIP C 470PF K		R8			RK73GB2A180J	CHIP R 18 J 1/10W	
C206			CK73GB1H104K	CHIP C 0.10UF K		R10			RK73GB2A123J	CHIP R 12K J 1/10W	
C207			CK73GB1H471K	CHIP C 470PF K		R11			RK73FB2B221J	CHIP R 220 J 1/8W	
C213			CK73GB1H471K	CHIP C 470PF K		R12			RK73GB2A103J	CHIP R 10K J 1/10W	
C215			CK73GB1H104K	CHIP C 0.10UF K		R13			RK73RB2H100J	CHIP R 10 J 1/2W	
C216			CK73GB1H471K	CHIP C 470PF K		R14			RK73FB2B221J	CHIP R 220 J 1/8W	
C217			CD04A21V100M	ELECTRO 10UF 35WV		R16			RK73RB2H821J	CHIP R 820 J 1/2W	
C218,219			CK73GB1H471K	CHIP C 470PF K		R17			RK73RB2H5R6J	CHIP R 5.6 J 1/2W	
C220			CD04A21V102M	ELECTRO 1000UF 35WV		R18			RK73RB2H821J	CHIP R 820 J 1/2W	
C221			CK73GB1H471K	CHIP C 470PF K		R19			RK73FB2B103J	CHIP R 10K J 1/8W	
C222			CK73GB1H104K	CHIP C 0.10UF K		R20			RK73EB2E221J	CHIP R 220 J 1/4W	
C223			CK73GB1H471K	CHIP C 470PF K		R21			RK73FB2B123J	CHIP R 12K J 1/8W	
C224			CK73GB1H104K	CHIP C 0.10UF K		R22-25			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C225-233			CK73GB1H471K	CHIP C 470PF K		R26			RK73FB2B103J	CHIP R 10K J 1/8W	
C234		*	CD04BQ1H101M	ELECTRO 100UF 50WV		R27			RK73RB2H471J	CHIP R 470 J 1/2W	
C235			CC73GCH1H220J	CHIP C 22PF J							
C236			CC73GCH1H101J	CHIP C 100PF J							
C237,238			CK73GB1H471K	CHIP C 470PF K							
C239			CC73GCH1H220J	CHIP C 22PF J							

## PARTS LIST / 零件表

FINAL UNIT (X45-3932-71)

CONTROL UNIT (X53-4490-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R28			RK73FB2B103J	CHIP R 10K J 1/8W	
R29			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R30			RK73FB2B750J	CHIP R 75 J 1/8W	
R31			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R32			RK73FB2B181J	CHIP R 180 J 1/8W	
R33			RK73GB2A274J	CHIP R 270K J 1/10W	
R34,35			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R36,37			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R38			RK73FB2B820J	CHIP R 82 J 1/8W	
R39			RK73PB2H121J	CHIP R 120 J 1/2W	
R40			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R41			RK73FB2B224J	CHIP R 220K J 1/8W	
R201			RK73GB2A273J	CHIP R 27K J 1/10W	
R202			RK73GB2A104J	CHIP R 100K J 1/10W	
R203			RK73GB2A683J	CHIP R 68K J 1/10W	
R204			RK73GB2A473J	CHIP R 47K J 1/10W	
R205,206			RK73GB2A104J	CHIP R 100K J 1/10W	
R207			RK73GB2A154J	CHIP R 150K J 1/10W	
R209			RK73GB2A334J	CHIP R 330K J 1/10W	
R211			RK73GB2A101J	CHIP R 100 J 1/10W	
R213			RK73GB2A334J	CHIP R 330K J 1/10W	
R215			RK73GB2A332J	CHIP R 3.3K J 1/10W	
R217			RK73GB2A333J	CHIP R 33K J 1/10W	
R218,219			RK73GB2A104J	CHIP R 100K J 1/10W	
R220			RK73GB2A224J	CHIP R 220K J 1/10W	
R222			RK73GB2A473J	CHIP R 47K 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			RK73GB2A274J	CHIP R 270K J 1/10W	
R353			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R355			RK73GB2A000J	CHIP R 0.0 J 1/10W	
D1			HSM88AS-E	DIODE	
D2			MA2S111-F	DIODE	
D3			HSM88AS-E	DIODE	
D4-7			L7091CER	DIODE	
D8			CSA70-401L	SURGE ABSORBER	
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			2SC5092-F	TRANSISTOR	
Q2			RD01MUS1-T113	FET	
Q3	2B		PD55008S-E	FET	
Q4	2B		RD60HUF1-101	FET	
Q203,204			2SJ484	FET	
Q205,206			SSM3K15TE(F)	FET	
Q207			DTD123EK	DIGITAL TRANSISTOR	
TH201			S1R103J440H	THERMISTOR	

Ref. No.	Address	New parts	Parts No.	Description	Destination
<b>CONTROL UNIT (X53-4490-10)</b>					
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			CS77CPOJ100M	CHIP TNL 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	

## PARTS LIST / 零件表

CONTROL UNIT (X53-4490-10)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C109			CS77CPOJ100M	CHIP TNTL 10UF 6.3WV		C207			CK73HB1E103K	CHIP C 0.010UF K	
C110,111			CC73HCH1H101J	CHIP C 100PF J		C209-212			CK73HB1H102K	CHIP C 1000PF K	
C112			CK73HB1A104K	CHIP C 0.10UF K		C213			CK73HB1E103K	CHIP C 0.010UF K	
C114			CC73HCH1H101J	CHIP C 100PF J		C215,216			CK73HB1H102K	CHIP C 1000PF K	
C115-119			CK73HB1A104K	CHIP C 0.10UF K		C218			CC73HCH1H101J	CHIP C 100PF J	
C120			CK73HB1A105K	CHIP C 1.0UF K		C219-223			CK73HB1H102K	CHIP C 1000PF K	
C121			CK73HB1H102K	CHIP C 1000PF K		C224			CC73HCH1H101J	CHIP C 100PF J	
C122-126			CK73HB1A104K	CHIP C 0.10UF K		C225,226			CK73HB1H102K	CHIP C 1000PF K	
C127			CK73HB1E103K	CHIP C 0.010UF K		C227			CC73HCH1H101J	CHIP C 100PF J	
C128			CK73HB1A105K	CHIP C 1.0UF K		C228,229			CK73HB1H102K	CHIP C 1000PF K	
C129			CK73HB1H102K	CHIP C 1000PF K		C230			CC73HCH1H101J	CHIP C 100PF J	
C130,131			CK73HB1A104K	CHIP C 0.10UF K		C232			CK73HB1H102K	CHIP C 1000PF K	
C132			CK73HB1E103K	CHIP C 0.010UF K		C233			CC73HCH1H101J	CHIP C 100PF J	
C133			CK73HB1H102K	CHIP C 1000PF K		C235			CK73HB1E103K	CHIP C 0.010UF K	
C134			CK73HB1E103K	CHIP C 0.010UF K		C237			CC73HCH1H101J	CHIP C 100PF J	
C135,136			CK73HB1H102K	CHIP C 1000PF K		C239			CC73HCH1H101J	CHIP C 100PF J	
C137			CK73HB1E103K	CHIP C 0.010UF K		C240-242			CK73HB1H102K	CHIP C 1000PF K	
C138			CC73HCH1H101J	CHIP C 100PF J		C243			CC73HCH1H101J	CHIP C 100PF J	
C139			CK73HB1E103K	CHIP C 0.010UF K		C244			CK73HB1H102K	CHIP C 1000PF K	
C140			CK73GB1C104K	CHIP C 0.10UF K		C245,246			CC73HCH1H101J	CHIP C 100PF J	
C141,142			CK73HB1H102K	CHIP C 1000PF K		C247			CK73HB1H102K	CHIP C 1000PF K	
C143			CK73HB1E103K	CHIP C 0.010UF K		C249			CK73HB1H102K	CHIP C 1000PF K	
C144-146			CK73HB1H102K	CHIP C 1000PF K		C250			CC73HCH1H101J	CHIP C 100PF J	
C147			CK73HB1E103K	CHIP C 0.010UF K		C252			CK73HB1H102K	CHIP C 1000PF K	
C148			CK73HB1H122K	CHIP C 1200PF K		C254			CC73HCH1H101J	CHIP C 100PF J	
C149			CK73HB1H102K	CHIP C 1000PF K		C256			CC73HCH1H101J	CHIP C 100PF J	
C150			CK73HB1E103K	CHIP C 0.010UF K		C257			CK73HB1H102K	CHIP C 1000PF K	
C151-155			CK73HB1H102K	CHIP C 1000PF K		C258			CC73HCH1H101J	CHIP C 100PF J	
C156			CC73HCH1H221J	CHIP C 220PF J		C259,260			CK73HB1A104K	CHIP C 0.10UF K	
C157			CK73HB1H102K	CHIP C 1000PF K		C301,302			C92-0905-05	OS-CON 47UF 35WV	
C158			CK73HB1A104K	CHIP C 0.10UF K		C303,304			C93-1810-05	CHIP C 4.7UF K	
C159			CK73HB1E103K	CHIP C 0.010UF K		C306			CK73HB1H471K	CHIP C 470PF K	
C160			CC73HCH1H101J	CHIP C 100PF J		C308			CK73EB1H474K	CHIP C 0.47UF K	
C161			CK73HB1H102K	CHIP C 1000PF K		C310,311			CE32AU1C330M	CHIP EL 33UF 16WV	
C162			CC73HCH1H101J	CHIP C 100PF J		C312			CE32BM1E470M	CHIP EL 47UF 25WV	
C164			CK73HB1H102K	CHIP C 1000PF K		C313			CK73HB1E223K	CHIP C 0.022UF K	
C166			CK73HB1E103K	CHIP C 0.010UF K		C314			CK73HB1H102K	CHIP C 1000PF K	
C167			CC73HCH1H101J	CHIP C 100PF J		C315-317			CE32BM1E470M	CHIP EL 47UF 25WV	
C170,171			CK73HB1H102K	CHIP C 1000PF K		C318-321			CK73HB1H102K	CHIP C 1000PF K	
C175,176			CK73HB1H102K	CHIP C 1000PF K		C322			CE32BM1E470M	CHIP EL 47UF 25WV	
C179,180			CK73HB1H102K	CHIP C 1000PF K		C323			CK73HB1H102K	CHIP C 1000PF K	
C182			CK73HB1H102K	CHIP C 1000PF K		C324			CE32BM1E470M	CHIP EL 47UF 25WV	
C184,185			CK73HB1H102K	CHIP C 1000PF K		C325,326			CK73HB1H102K	CHIP C 1000PF K	
C186			CC73HCH1H101J	CHIP C 100PF J		C327-329			CE32BM1E470M	CHIP EL 47UF 25WV	
C187			CK73HB1H102K	CHIP C 1000PF K		C330,331			CK73HB1H102K	CHIP C 1000PF K	
C188			CC73HCH1H101J	CHIP C 100PF J		C332			CE32BM1E470M	CHIP EL 47UF 25WV	
C189			CK73HB1H102K	CHIP C 1000PF K		C333			CK73HB1A104K	CHIP C 0.10UF K	
C190			CC73HCH1H101J	CHIP C 100PF J		C334			CK73HB1E103K	CHIP C 0.010UF K	
C191			CK73HB1H102K	CHIP C 1000PF K		C335			CK73HB1H471K	CHIP C 470PF K	
C192			CK73HB1E103K	CHIP C 0.010UF K		C336			CK73HB1E103K	CHIP C 0.010UF K	
C193			CC73HCH1H101J	CHIP C 100PF J		C337			CK73HB1H102K	CHIP C 1000PF K	
C194-197			CK73HB1H102K	CHIP C 1000PF K		C401			CK73HB1E103K	CHIP C 0.010UF K	
C198			CC73HCH1H101J	CHIP C 100PF J		C402			CC73HCH1H101J	CHIP C 100PF J	
C199			CK73HB1E103K	CHIP C 0.010UF K		C403			CK73HB1A105K	CHIP C 1.0UF K	
C200			CC73HCH1H101J	CHIP C 100PF J		C404			C90-4120-05	ELECTRO 470UF 35WV	
C201			CK73HB1H102K	CHIP C 1000PF K		C405			CK73HB1A104K	CHIP C 0.10UF K	
C202			CC73HCH1H101J	CHIP C 100PF J		C406,407			CK73HB1A105K	CHIP C 1.0UF K	
C203			CK73HB1H102K	CHIP C 1000PF K		C408,409			C93-0912-05	CHIP C 100UF M	
C205			CK73HB1H102K	CHIP C 1000PF K		C410			CK73HB1A105K	CHIP C 1.0UF K	
C206			CC73HCH1H101J	CHIP C 100PF J		C412			CK73FB0J106K	CHIP C 10UF K	

## PARTS LIST / 零件表

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

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C413			CK73HB1H102K	CHIP C 1000PF K		L17			L92-0639-05	CHIP FERRITE	
C414			CK73HB1A105K	CHIP C 1.0UF K		L18			L92-0162-05	BEADS CORE	
C415			CD04AY1E470M	ELECTRO 47UF 25WV		L20			L92-0162-05	BEADS CORE	
C416			CK73HB1H102K	CHIP C 1000PF K		L22,23			L92-0171-05	BEADS CORE	
C417			CK73HB1H222K	CHIP C 2200PF K		L301-304			L92-0639-05	CHIP FERRITE	
C418			CC73HCH1H391J	CHIP C 390PF J		L305			L33-1541-05	SMALL FIXED INDUCTOR (10UH)	
C419			CK73HB1H152K	CHIP C 1500PF K		L306-309			L92-0467-05	CHIP FERRITE	
C420			CC73HCH1H221J	CHIP C 220PF J		L311			L92-0162-05	BEADS CORE	
C421			CK73FB0J106K	CHIP C 10UF K		L312			L92-0467-05	CHIP FERRITE	
C422			CD04AY1E470M	ELECTRO 47UF 25WV		L313,314			L92-0639-05	CHIP FERRITE	
C423			CK73HB1H471K	CHIP C 470PF K		L315-317			L92-0467-05	CHIP FERRITE	
C424			CC73HCH1H331J	CHIP C 330PF J		X1			L77-3015-05	TCXO (18.432MHZ)	
C425			CD04AY1E470M	ELECTRO 47UF 25WV		X2			L77-1802-05	CRYSTAL RESONATOR (32768HZ)	
C426			CK73HB1A104K	CHIP C 0.10UF K		CP1-8			RK74HB1J334J	CHIP-COM 330K J 1/16W	
C427			CK73HB1H471K	CHIP C 470PF K		R3-9			RK73HB1J104J	CHIP R 100K J 1/16W	
C428			CK73HB1A105K	CHIP C 1.0UF K		R10-13			RK73EB2E101J	CHIP R 100 J 1/4W	
C429			CK73HB1A104K	CHIP C 0.10UF K		R14			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C430			C92-0777-05	ELECTRO 1000UF 25WV		R15			RK73HB1J104J	CHIP R 100K J 1/16W	
C432			CK73HB1A104K	CHIP C 0.10UF K		R18			RK73HB1J104J	CHIP R 100K J 1/16W	
C433			CC73HCH1H181J	CHIP C 180PF J		R22,23			RK73HB1J104J	CHIP R 100K J 1/16W	
C434,435			CC73HCH1H101J	CHIP C 100PF J		R24			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C436			CC73HCH1H221J	CHIP C 220PF J		R25,26			RK73HB1J103J	CHIP R 10K J 1/16W	
C438			C93-0912-05	CHIP C 100UF M		R27,28			RK73HB1J473J	CHIP R 47K J 1/16W	
C441			C93-0912-05	CHIP C 100UF M		R29			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C442			CK73HB1A105K	CHIP C 1.0UF K		R30			RK73HB1J474J	CHIP R 470K J 1/16W	
C443			CK73HB1A104K	CHIP C 0.10UF K		R32,33			RK73HB1J472J	CHIP R 4.7K J 1/16W	
C445			CK73HB1A105K	CHIP C 1.0UF K		R34-36			RK73HB1J104J	CHIP R 100K J 1/16W	
C446			CK73HB1A104K	CHIP C 0.10UF K		R37			RK73HB1J103J	CHIP R 10K J 1/16W	
C450,451			CK73HB1A105K	CHIP C 1.0UF K		R38			RK73HB1J104J	CHIP R 100K J 1/16W	
C455			CC73HCH1H101J	CHIP C 100PF J		R40-42			RK73HB1J104J	CHIP R 100K J 1/16W	
C456			CC73HCH1H221J	CHIP C 220PF J		R43-50			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C457			CK73HB1A105K	CHIP C 1.0UF K		R51			RK73HB1J104J	CHIP R 100K J 1/16W	
C459			CC73HCH1H221J	CHIP C 220PF J		R52			RK73HB1J220J	CHIP R 22 J 1/16W	
C460-462			CK73HB1A104K	CHIP C 0.10UF K		R53-57			RK73HB1J104J	CHIP R 100K J 1/16W	
C463			CC73HCH1H331J	CHIP C 330PF J		R58			RK73HB1J101J	CHIP R 100 J 1/16W	
C464			CC73HCH1H101J	CHIP C 100PF J		R59-61			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C465			CK73HB1H152K	CHIP C 1500PF K		R62			RK73HB1J101J	CHIP R 100 J 1/16W	
C466			CK73HB1A105K	CHIP C 1.0UF K		R63			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C469			CK73HB1A105K	CHIP C 1.0UF K		R64,65			RK73HB1J101J	CHIP R 100 J 1/16W	
C470,471			CK73HB1H102K	CHIP C 1000PF K		R66-73			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C472,473			CK73HB1E103K	CHIP C 0.010UF K		R74,75			RK73HB1J104J	CHIP R 100K J 1/16W	
CN5			E41-1481-05	PIN ASSY		R77			RK73HB1J151J	CHIP R 150 J 1/16W	
CN38			E40-6656-05	PIN ASSY		R78			RK73HB1J102J	CHIP R 1.0K J 1/16W	
CN39			E04-0193-05	PIN SOCKET		R79			RK73HB1J000J	CHIP R 0.0 J 1/16W	
CN40			E40-6102-05	PIN ASSY		R80			RK73HB1J823J	CHIP R 82K J 1/16W	
CN41			E41-3086-05	PIN ASSY		R81-83			RK73HB1J104J	CHIP R 100K J 1/16W	
CN42			E41-3090-05	PIN ASSY		R85			RK73HB1J103J	CHIP R 10K J 1/16W	
CN43			E41-2671-05	PIN ASSY		R87			RK73HB1J334J	CHIP R 330K J 1/16W	
CN44			E40-5960-05	PIN ASSY		R88			RK73HB1J100J	CHIP R 10 J 1/16W	
CN301			E41-2672-05	PIN ASSY		R89			RK73HB1J332J	CHIP R 3.3K J 1/16W	
CN302			J19-5386-05	HOLDER (LITHIUM CELL)		R90			RK73HB1J471J	CHIP R 470 J 1/16W	
L1			L92-0467-05	CHIP FERRITE		R92-94			RK73HB1J104J	CHIP R 100K J 1/16W	
L2,3			L33-1500-05	CHOKE COIL		R95			RK73HB1J220J	CHIP R 22 J 1/16W	
L4			L92-0467-05	CHIP FERRITE		R99,100			RK73HB1J104J	CHIP R 100K J 1/16W	
L5-7			L92-0162-05	BEADS CORE		R101			RK73HB1J103J	CHIP R 10K J 1/16W	
L8			L92-0639-05	CHIP FERRITE		R102,103			RK73HB1J104J	CHIP R 100K J 1/16W	
L9-11			L92-0467-05	CHIP FERRITE		R104			RK73HB1J393J	CHIP R 39K J 1/16W	
L14-16			L92-0467-05	CHIP FERRITE		R105			RK73HB1J334J	CHIP R 330K J 1/16W	
						R106			RK73HB1J100J	CHIP R 10 J 1/16W	



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CONTROL UNIT (X53-4490-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R107			RK73HB1J103J	CHIP R 10K J 1/16W		R209			RK73HB1J121J	CHIP R 120 J 1/16W	
R108			RK73HB1J184J	CHIP R 180K J 1/16W		R210			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R109			RK73HB1J104J	CHIP R 100K J 1/16W		R211,212			RK73HB1J101J	CHIP R 100 J 1/16W	
R110			RK73HB1J682J	CHIP R 6.8K J 1/16W		R213-219			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R111,112			RK73HB1J104J	CHIP R 100K J 1/16W		R220			RK73HB1J471J	CHIP R 470 J 1/16W	
R113			RK73HB1J102J	CHIP R 1.0K J 1/16W		R221			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R114,115			RK73HB1J220J	CHIP R 22 J 1/16W		R222			RK73HB1J101J	CHIP R 100 J 1/16W	
R116,117			RK73HB1J472J	CHIP R 4.7K J 1/16W		R223			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R118			RK73HB1J000J	CHIP R 0.0 J 1/16W		R224			RK73HB1J121J	CHIP R 120 J 1/16W	
R119			RK73HB1J474J	CHIP R 470K J 1/16W		R225			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R121			RK73HB1J104J	CHIP R 100K J 1/16W		R226			RK73HB1J103J	CHIP R 10K J 1/16W	
R122			RK73HB1J103J	CHIP R 10K J 1/16W		R227-230			RK73HB1J122J	CHIP R 1.2K J 1/16W	
R123			RK73HB1J473J	CHIP R 47K J 1/16W		R231-238			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R124			RK73HB1J103J	CHIP R 10K J 1/16W		R241-253			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R126			RK73HB1J104J	CHIP R 100K J 1/16W		R254			RK73HB1J103J	CHIP R 10K J 1/16W	
R127			RK73HB1J102J	CHIP R 1.0K J 1/16W		R255-262			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R128			RK73HB1J104J	CHIP R 100K J 1/16W		R263			RK73HB1J103J	CHIP R 10K J 1/16W	
R129,130			RK73HB1J101J	CHIP R 100 J 1/16W		R265,266			RK73HB1J471J	CHIP R 470 J 1/16W	
R131			RK73HB1J472J	CHIP R 4.7K J 1/16W		R267			RK73HB1J103J	CHIP R 10K J 1/16W	
R132			RK73HB1J102J	CHIP R 1.0K J 1/16W		R268			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R133			RK73HB1J472J	CHIP R 4.7K J 1/16W		R269			RK73HB1J103J	CHIP R 10K J 1/16W	
R135			RK73HB1J104J	CHIP R 100K J 1/16W		R270-275			RK73HB1J101J	CHIP R 100 J 1/16W	
R137,138			RK73HB1J104J	CHIP R 100K J 1/16W		R276			RK73HB1J471J	CHIP R 470 J 1/16W	
R141,142			RK73HB1J104J	CHIP R 100K J 1/16W		R277			RK73HB1J101J	CHIP R 100 J 1/16W	
R143,144			RK73HB1J000J	CHIP R 0.0 J 1/16W		R278,279			RK73HB1J471J	CHIP R 470 J 1/16W	
R145			RK73HB1J104J	CHIP R 100K J 1/16W		R280			RK73HB1J101J	CHIP R 100 J 1/16W	
R146,147			RK73HB1J101J	CHIP R 100 J 1/16W		R281			RS14KB3D5R6J	FL-PROOF RS 5.6 J 2W	
R148			RK73HB1J563J	CHIP R 56K J 1/16W		R282			RK73HB1J104J	CHIP R 100K J 1/16W	
R149-151			RK73HB1J104J	CHIP R 100K J 1/16W		R301,302			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R152			RK73HB1J102J	CHIP R 1.0K J 1/16W		R303			RK73HB1J104J	CHIP R 100K J 1/16W	
R153			RK73HB1J473J	CHIP R 47K J 1/16W		R304			RK73HB1J223J	CHIP R 22K J 1/16W	
R154,155			RK73HB1J104J	CHIP R 100K J 1/16W		R305			RK73HB1J183J	CHIP R 18K J 1/16W	
R156,157			RK73HB1J474J	CHIP R 470K J 1/16W		R306			RK73HH1J184D	CHIP R 180K D 1/16W	
R159			RK73HB1J103J	CHIP R 10K J 1/16W		R307			RK73HH1J273D	CHIP R 27K D 1/16W	
R160			RK73HB1J101J	CHIP R 100 J 1/16W		R308			RK73HB1J473J	CHIP R 47K J 1/16W	
R161			RK73HB1J103J	CHIP R 10K J 1/16W		R309			RK73PB2H220J	CHIP R 22 J 1/2W	
R162			RK73HB1J104J	CHIP R 100K J 1/16W		R310			RK73GB2A220J	CHIP R 22 J 1/10W	
R163			RK73HH1J334D	CHIP R 330K D 1/16W		R312			RK73HB1J104J	CHIP R 100K J 1/16W	
R164			RK73HH1J104D	CHIP R 100K D 1/16W		R313			RK73HH1J822D	CHIP R 8.2K D 1/16W	
R165,166			RK73HB1J104J	CHIP R 100K J 1/16W		R314			RK73HH1J332D	CHIP R 3.3K D 1/16W	
R167-169			RK73HB1J473J	CHIP R 47K J 1/16W		R315			RK73HB1J471J	CHIP R 470 J 1/16W	
R170			RK73HH1J124D	CHIP R 120K D 1/16W		R316			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R171			RK73HB1J473J	CHIP R 47K J 1/16W		R317,318			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R172			RK73HB1J103J	CHIP R 10K J 1/16W		R319			RK73HB1J103J	CHIP R 10K J 1/16W	
R173,174			RK73HB1J473J	CHIP R 47K J 1/16W		R320			RK73HB1J101J	CHIP R 100 J 1/16W	
R175			RK73HB1J683J	CHIP R 68K J 1/16W		R321			RK73HH1J272D	CHIP R 2.7K D 1/16W	
R176-178			RK73HB1J473J	CHIP R 47K J 1/16W		R322			RK73HH1J473J	CHIP R 47K D 1/16W	
R179			RK73HB1J000J	CHIP R 0.0 J 1/16W		R323			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R180-183			RK73HB1J473J	CHIP R 47K J 1/16W		R324			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R184			RK73HB1J000J	CHIP R 0.0 J 1/16W		R401			RK73HB1J473J	CHIP R 47K J 1/16W	
R185			RK73HB1J473J	CHIP R 47K J 1/16W		R402			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R186			RK73HB1J103J	CHIP R 10K J 1/16W		R403			RK73HB1J473J	CHIP R 47K J 1/16W	
R187			RK73HB1J473J	CHIP R 47K J 1/16W		R404			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R190			RK73HB1J000J	CHIP R 0.0 J 1/16W		R405			RK73HB1J473J	CHIP R 47K J 1/16W	
R191			RK73HB1J474J	CHIP R 470K J 1/16W		R406,407			RK73HB1J104J	CHIP R 100K J 1/16W	
R194			RK73HB1J103J	CHIP R 10K J 1/16W		R408,409			RK73HB1J103J	CHIP R 10K J 1/16W	
R196,197			RK73HB1J103J	CHIP R 10K J 1/16W		R410			RK73HB1J104J	CHIP R 100K J 1/16W	
R199			RK73HB1J103J	CHIP R 10K J 1/16W		R411			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R204			RK73HB1J103J	CHIP R 10K J 1/16W		R412			RK73HB1J123J	CHIP R 12K J 1/16W	
R205-208			RK73HB1J102J	CHIP R 1.0K J 1/16W		R413			RK73HB1J223J	CHIP R 22K J 1/16W	

## PARTS LIST / 零件表

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

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R414			RK73HB1J153J	CHIP R 15K J 1/16W		D37			SMD185F-2	VARISTOR	
R415			RK73HB1J123J	CHIP R 12K J 1/16W		D301			RSX301L-30	DIODE	
R416			RK73HB1J224J	CHIP R 220K J 1/16W		D302			1SS388F	DIODE	
R417,418			RK73HB1J104J	CHIP R 100K J 1/16W		D303			02DZ18F-X	ZENER DIODE	
R419			RK73HB1J105J	CHIP R 1.0M J 1/16W		D304,305			1SS388F	DIODE	
R420			RK73HB1J000J	CHIP R 0.0 J 1/16W		D401			1SS388F	DIODE	
R421			RK73HB1J393J	CHIP R 39K J 1/16W		IC3		*	E29PL03270TID	ROM IC	
R422			RK73HB1J223J	CHIP R 22K J 1/16W		IC4,5			ISL8485EIBZ	MOS-IC	
R423			RK73HB1J471J	CHIP R 470 J 1/16W		IC6			<b>Note 1 (BGA)</b>	MICROPROCESSOR IC	
R424			RK73HB1J153J	CHIP R 15K J 1/16W		IC7,8			TC7WT125FUF	MOS-IC	
R425			RK73HB1J223J	CHIP R 22K J 1/16W		IC9			<b>Note 1 (BGA)</b>	SRAM IC	
R426			RK73HB1J103J	CHIP R 10K J 1/16W		IC10,11			TC7SH125FU-F	MOS-IC	
R430			RK73HB1J2R7J	CHIP R 2.7 J 1/16W		IC12			TC7SH08FU-F	MOS-IC	
R431			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC13			TC75W51FK(F)	MOS-IC	
R432			RK73HB1J333J	CHIP R 33K J 1/16W		IC14			AK4386VTP	MOS-IC	
R433			RK73HB1J104J	CHIP R 100K J 1/16W		IC15			TC75W51FK(F)	MOS-IC	
R435			RK73HB1J473J	CHIP R 47K J 1/16W		IC16			SM5023CNDH-G	MOS-IC	
R436			RK73HB1J124J	CHIP R 120K J 1/16W		IC17			R2023T	MOS-IC	
R437			RK73HB1J333J	CHIP R 33K J 1/16W		IC18			TC74VHCT244AFK	MOS-IC	
R438			RK73HB1J104J	CHIP R 100K J 1/16W		IC19			TC7MBD3245AFK	MOS-IC	
R439			RK73HB1J473J	CHIP R 47K J 1/16W		IC20			<b>Note 1 (BGA)</b>	MOS-IC	
R441			RK73HB1J104J	CHIP R 100K J 1/16W		IC21			ADM1101EARMZ	MOS-IC	
R442			RK73HB1J683J	CHIP R 68K J 1/16W		IC22			MCP23017TE/ML	MOS-IC	
R443			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC23			TC7WT125FUF	MOS-IC	
R444,445			RK73HB1J333J	CHIP R 33K J 1/16W		IC24			TC7SH08FU-F	MOS-IC	
R446			RK73HB1J224J	CHIP R 220K J 1/16W		IC25			TC7SH32FU-F	MOS-IC	
R450			RK73HB1J473J	CHIP R 47K J 1/16W		IC26			TC7SET08FU-F	MOS-IC	
R451			RK73HB1J104J	CHIP R 100K J 1/16W		IC27			TC75W51FK(F)	MOS-IC	
R452			RK73HB1J473J	CHIP R 47K J 1/16W		IC28			TC75S51FE(F)	MOS-IC	
R457			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC301			LT3685EMSE	ANALOGUE IC	
R458-460			RK73HB1J101J	CHIP R 100 J 1/16W		IC302			XC6201P502PR	MOS-IC	
R461-463			RK73HB1J223J	CHIP R 22K J 1/16W		IC303			XC6204B332P1	ANALOGUE IC	
R464,465			RK73HB1J104J	CHIP R 100K J 1/16W		IC304			XC6205B152PRN	ANALOGUE IC	
R466,467			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC305			XC6205B162PR	ANALOGUE IC	
R502			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC306			XC6204B332P1	ANALOGUE IC	
R508			RK73HB1J103J	CHIP R 10K J 1/16W		IC307			XC61CN2702N	MOS-IC	
R509			RK73HB1J223J	CHIP R 22K J 1/16W		IC308			XC6109C29ANN	ANALOGUE IC	
R510			RK73HB1J103J	CHIP R 10K J 1/16W		IC401			TC7SH00FU-F	MOS-IC	
R511			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC402			TC7S66FUF	MOS-IC	
D1			RB706F-40	DIODE		IC403	3B		LA4422-E	BI-POLAR IC	
D2			MA2S111-F	DIODE		IC404			NJM2732V	BI-POLAR IC	
D3			1SS388F	DIODE		IC405			NJM2734V	BI-POLAR IC	
D4-11			DA204U	DIODE		IC406			NJM2732V	BI-POLAR IC	
D12			1SS355	DIODE		IC407			TC7W53FK(F)	MOS-IC	
D13			02DZ18F-X	ZENER DIODE		IC411			NJM2734V	BI-POLAR IC	
D14-16			DA204U	DIODE		IC412			M622364FP-F	MOS-IC	
D18			DA204U	DIODE		Q4			2SC4617(S)	TRANSISTOR	
D20			DA204U	DIODE		Q5			SSM3K15TE(F)	FET	
D22			DA204U	DIODE		Q6-10			2SD2114K(W)	TRANSISTOR	
D23			1SS355	DIODE		Q301			RT1N441U-T111	TRANSISTOR	
D24			02DZ18F-X	ZENER DIODE		Q302			SSM3K15TE(F)	FET	
D26			DA204U	DIODE		Q303			2SA1955A-F	TRANSISTOR	
D28			DA204U	DIODE		Q401			RT1N141M-T111	TRANSISTOR	
D29			1SS355	DIODE		Q402			2SJ506-E(S)	FET	
D30			02DZ18F-X	ZENER DIODE		Q403			RT1N441M-T111	TRANSISTOR	
D31			1SS355	DIODE		Q404			RT1N141M-T111	TRANSISTOR	
D32			02DZ18F-X	ZENER DIODE		Q405			DTC363EU	DIGITAL TRANSISTOR	
D35			1SS355	DIODE		TH1			ERTJ0EV104H	THERMISTOR	
D36			02DZ18F-X	ZENER DIODE							

## PARTS LIST / 零件表

DISPLAY UNIT (X54-3730-20)  
TX-RX UNIT (X57-7952-71)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
<b>DISPLAY UNIT (X54-3730-20)</b>						<b>TX-RX UNIT (X57-7952-71)</b>					
D503-505			B30-2151-05	LED (RED/GREEN)		VR501			R32-0689-05	SEMI FIXED VARIABLE RESISTOR (10K)	
C501			CS77BA1A100M	CHIP TNTL 10UF 10WV		VR601			R31-0630-05	VARIABLE RESISTOR (10K)	
C502,503			CS77AA1A1R5M	CHIP TNTL 1.5UF 10WV		S501-506			S70-0502-05	TACT SWITCH	
C504,505			CK73GB1C104K	CHIP C 0.10UF K		S507			S68-0430-05	PUSH SWITCH	
C506			CC73GCH1H470J	CHIP C 47PF J		D501,502			HSM88AS-E	DIODE	
C507,508			CK73GB1C104K	CHIP C 0.10UF K		D506,507			LA-501DD	LED	
C509			CK73GB1H103K	CHIP C 0.010UF K		D508-514			DA204U	DIODE	
C510			CS77BA1A100M	CHIP TNTL 10UF 10WV		D601,602			DA204U	DIODE	
C511,512			CK73GB1E103K	CHIP C 0.010UF K		D603			MINISMDC020F	VARISTOR	
C513-518			CC73GCH1H101J	CHIP C 100PF J		IC501			NJM4558E-ZB	ANALOGUE IC	
C519,520			CK73GB1E103K	CHIP C 0.010UF K		IC502-505			BU4094BCFV	MOS-IC	
C521			CS77BA1A100M	CHIP TNTL 10UF 10WV		IC506,507			TA78L05FF	MOS-IC	
C522			CK73GB1C104K	CHIP C 0.10UF K		IC508			TC7W53FU-F	HYBRID IC	
C523			CK73FB1E334K	CHIP C 0.33UF K		Q501			2SC4116(Y)F	TRANSISTOR	
C524			CS77BA1A100M	CHIP TNTL 10UF 10WV		Q502			2SA1586(Y,GR)F	TRANSISTOR	
C525			CK73GB1C104K	CHIP C 0.10UF K		Q503,504			UPA672T-A	FET	
C526			CK73FB1E334K	CHIP C 0.33UF K		Q506			RT1P141M-T111	TRANSISTOR	
C527			CK73GB1H102K	CHIP C 1000PF K		Q507			UPA672T-A	FET	
C528			CK73GB1H103K	CHIP C 0.010UF K		Q508-511			RT1P141M-T111	TRANSISTOR	
C532			CK73GB1H102K	CHIP C 1000PF K		Q512-514			UPA672T-A	FET	
C533			CC73GCH1H101J	CHIP C 100PF J		Q516-519			UPA672T-A	FET	
C534			CK73GB1H102K	CHIP C 1000PF K		Q521-524			UPA672T-A	FET	
C601			CC73GCH1H101J	CHIP C 100PF J		Q525			2SK1824-A	FET	
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		C100			CC73HCH1H050B	CHIP C 5.0PF B	
CN502			E40-6102-05	PIN ASSY		C101			CC73HCH1H560J	CHIP C 56PF J	
CN601			E41-2751-05	PIN ASSY		C102			CC73HCH1H060B	CHIP C 6.0PF B	
J601			E58-0522-05	MODULAR JACK		C103			CC73HCH1H150G	CHIP C 15PF G	
-			J31-0543-05	COLLAR (LH-5-1.5)		C104			CK73HB1H471K	CHIP C 470PF K	
CP51-54			RK75GB1J471J	CHIP-COM 470 J 1/16W		C105			CC73HCH1H090B	CHIP C 9.0PF B	
R502,503			RK73GB2A000J	CHIP R 0.0 J 1/10W		C106			CK73HB1H471K	CHIP C 470PF K	
R505			RK73GB2A683J	CHIP R 68K J 1/10W		C107,108			CC73HCH1H120G	CHIP C 12PF G	
R506			RK73GB2A103J	CHIP R 10K J 1/10W		C109			CK73HB1H471K	CHIP C 470PF K	
R507			RK73GB2A682J	CHIP R 6.8K J 1/10W		C110			CS77CA1V2R2M	CHIP TNTL 2.2UF 35WV	
R508			RK73GB2A102J	CHIP R 1.0K J 1/10W		C111			CC73HCH1H090B	CHIP C 9.0PF B	
R509			RK73GB2A103J	CHIP R 10K J 1/10W		C112			CC73HCH1H180G	CHIP C 18PF G	
R510			RK73GB2A224J	CHIP R 220K J 1/10W		C113			CC73HCH1H100B	CHIP C 10PF B	
R511,512			RK73GB2A103J	CHIP R 10K J 1/10W		C114			CK73HB1H471K	CHIP C 470PF K	
R513			RK73GB2A104J	CHIP R 100K J 1/10W		C115			CC73HCH1H090B	CHIP C 9.0PF B	
R514			RK73GB2A154J	CHIP R 150K J 1/10W		C116			CK73HB1H471K	CHIP C 470PF K	
R516			RK73PB2H102J	CHIP R 1.0K J 1/2W		C117			CC73HCH1H050B	CHIP C 5.0PF B	
R517			RK73PB2H821J	CHIP R 820 J 1/2W		C118			CC73HCH1H120G	CHIP C 12PF G	
R518,519			RK73PB2H102J	CHIP R 1.0K J 1/2W		C119			CK73HB1E104K	CHIP C 0.10UF K	
R520-526			RK73PB2H821J	CHIP R 820 J 1/2W		C120			CK73HB1H471K	CHIP C 470PF K	
R529-540			RK73GB2A102J	CHIP R 1.0K J 1/10W		C121			CC73HCH1H060B	CHIP C 6.0PF B	
R541-544			RK73GB2A103J	CHIP R 10K J 1/10W		C122			CK73HB1H471K	CHIP C 470PF K	
R545			RK73GH2A472D	CHIP R 4.7K D 1/10W		C123			CK73HB1E104K	CHIP C 0.10UF K	
R546			RK73GH2A153D	CHIP R 15K D 1/10W		C124			CC73HCH1H080B	CHIP C 8.0PF B	
R547			RK73GB2A103J	CHIP R 10K J 1/10W		C125			CK73HB1H471K	CHIP C 470PF K	
R550			RK73GB2A472J	CHIP R 4.7K J 1/10W		C126			CK73HB1E104K	CHIP C 0.10UF K	
R601			RK73GB2A681J	CHIP R 680 J 1/10W		C127			CK73HB1H471K	CHIP C 470PF K	
R604,605			RK73GB2A102J	CHIP R 1.0K J 1/10W		C129			CC73HCH1H080B	CHIP C 8.0PF B	
R606			RK73GB2A473J	CHIP R 47K J 1/10W		C130			CC73HCH1H100B	CHIP C 10PF B	
						C131			CK73HB1E104K	CHIP C 0.10UF K	
						C134			CK73HB1H471K	CHIP C 470PF K	
						C135			CC73HCH1H050B	CHIP C 5.0PF B	

## PARTS LIST / 零件表

### TX-RX UNIT (X57-7952-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C136			CC73HCH1H120G	CHIP C 12PF G		C237			CC73HCH1H080B	CHIP C 8.0PF B	
C137			CK73HB1H471K	CHIP C 470PF K		C240			CK73HB1H471K	CHIP C 470PF K	
C138			CC73HCH1H090B	CHIP C 9.0PF B		C241			CC73HCH1H080B	CHIP C 8.0PF B	
C139			CK73HB1H471K	CHIP C 470PF K		C242			CC73HCH1H020B	CHIP C 2.0PF B	
C140			CC73HCH1H180G	CHIP C 18PF G		C243			CC73HCH1H120J	CHIP C 12PF J	
C141			CC73HCH1H100B	CHIP C 10PF B		C244			CC73HCH1H010B	CHIP C 1.0PF B	
C142			CK73HB1H471K	CHIP C 470PF K		C245			CC73HCH1H060D	CHIP C 6.0PF D	
C143			CC73HCH1H090B	CHIP C 9.0PF B		C246			CK73HB1H103K	CHIP C 0.010UF K	
C144			CC73HCH1H100C	CHIP C 10PF C		C247			CK73HB1H471K	CHIP C 470PF K	
C145			CC73HCH1H120G	CHIP C 12PF G		C300			CC73HCH1H270J	CHIP C 27PF J	
C146			CK73HB1H471K	CHIP C 470PF K		C301			CK73HB1H471K	CHIP C 470PF K	
C147			CC73HCH1H090B	CHIP C 9.0PF B		C302-305			CK73HB1H103K	CHIP C 0.010UF K	
C148			CK73HB1H471K	CHIP C 470PF K		C306			CC73HCH1H020B	CHIP C 2.0PF B	
C149			CC73HCH1H040B	CHIP C 4.0PF B		C318			CC73HCH1H270G	CHIP C 27PF G	
C150			CC73HCH1H150G	CHIP C 15PF G		C322			CK73HB1H471K	CHIP C 470PF K	
C151,152			CC73HCH1H050B	CHIP C 5.0PF B		C323			CE32CL1E4R7M	CHIP EL 4.7UF 25WV	
C154			CC73HCH1H050B	CHIP C 5.0PF B		C325			CK73HB1E104K	CHIP C 0.10UF K	
C155			CC73HCH1H010B	CHIP C 1.0PF B		C326			CC73HCH1H220J	CHIP C 2.2PF J	
C156			CC73HCH1H050B	CHIP C 5.0PF B		C328			CC73HCH1H020B	CHIP C 2.0PF B	
C157			CC73HCH1H560J	CHIP C 56PF J		C329			CK73HB1H103K	CHIP C 0.010UF K	
C158			CC73HCH1H080B	CHIP C 8.0PF B		C331			CK73HB1H471K	CHIP C 470PF K	
C159			CC73HCH1H060B	CHIP C 6.0PF B		C332			CC73HCH1H150J	CHIP C 15PF J	
C160			CK73HB1H471K	CHIP C 470PF K		C333			CC73HCH1H120J	CHIP C 12PF J	
C161			CK73HB1H561K	CHIP C 560PF K		C334			CK73HB1H103K	CHIP C 0.010UF K	
C162,163			CC73HCH1H050B	CHIP C 5.0PF B		C335			CC73HCH1H820J	CHIP C 82PF J	
C164			CC73HCH1H060B	CHIP C 6.0PF B		C336			CC73HCH1H270J	CHIP C 27PF J	
C165,166			CC73HCH1H050B	CHIP C 5.0PF B		C337,338			CK73HB1H103K	CHIP C 0.010UF K	
C167-169			CC73HCH1H060B	CHIP C 6.0PF B		C339			CC73HCH1H471J	CHIP C 470PF J	
C170			CC73HCH1H560J	CHIP C 56PF J		C341			CK73HB1H103K	CHIP C 0.010UF K	
C171,172			CC73HCH1H060B	CHIP C 6.0PF B		C342			CC73HCH1H180J	CHIP C 18PF J	
C173			CC73HCH1H030B	CHIP C 3.0PF B		C343,344			CK73HB1H103K	CHIP C 0.010UF K	
C174			CC73HCH1H040B	CHIP C 4.0PF B		C345			CK73HB1H471K	CHIP C 470PF K	
C175			CC73HCH1H050B	CHIP C 5.0PF B		C346			CC73HCH1H180J	CHIP C 18PF J	
C176			CK73GB1H471K	CHIP C 470PF K		C347			CC73HCH1H150G	CHIP C 15PF G	
C200,201			CS77CA1V2R2M	CHIP TNL 2.2UF 35WV		C349			CK73HB1H103K	CHIP C 0.010UF K	
C202			CC73HCH1H100D	CHIP C 10PF D		C350			CK73HB1E104K	CHIP C 0.10UF K	
C203			CK73HB1H471K	CHIP C 470PF K		C352			CC73HCH1H100D	CHIP C 10PF D	
C204			CC73HCH1H101J	CHIP C 100PF J		C353			CC73HCH1H180J	CHIP C 18PF J	
C205			CK73HB1E104K	CHIP C 0.10UF K		C354			CC73HCH1H090B	CHIP C 9.0PF B	
C206			CC73HCH1H470J	CHIP C 47PF J		C356			CC73HCH1H100D	CHIP C 10PF D	
C207,208			CS77BA1D100M	CHIP TNL 10UF 20WV		C358			CC73HCH1H100D	CHIP C 10PF D	
C209			CK73HB1H471K	CHIP C 470PF K		C400-403			CK73HB1E104K	CHIP C 0.10UF K	
C210			CE32CL1V100M	CHIP EL 10UF 35WV		C404			CC73HCH1H100D	CHIP C 10PF D	
C211			CK73HB1H471K	CHIP C 470PF K		C405,406			CK73HB1E104K	CHIP C 0.10UF K	
C212			CK73HB1H103K	CHIP C 0.010UF K		C407			CK73HB1H471K	CHIP C 470PF K	
C213			CC73HCH1H100B	CHIP C 10PF B		C408			CK73HB1E104K	CHIP C 0.10UF K	
C214			CC73HCH1H050B	CHIP C 5.0PF B		C410			CK73HB1H471K	CHIP C 470PF K	
C216			CC73HCH1H050B	CHIP C 5.0PF B		C411			CK73GB1E105K	CHIP C 1.0UF K	
C219			CC73HCH1H100D	CHIP C 10PF D		C412			CK73HB1H471K	CHIP C 470PF K	
C220-223			CK73HB1H103K	CHIP C 0.010UF K		C413			CK73GB1E105K	CHIP C 1.0UF K	
C224			CK73HB1H471K	CHIP C 470PF K		C414			CK73HB1H471K	CHIP C 470PF K	
C225			CC73HCH1H100D	CHIP C 10PF D		C415			CK73HB1E104K	CHIP C 0.10UF K	
C226			CC73HCH1H680J	CHIP C 68PF J		C416			CK73HB1H103K	CHIP C 0.010UF K	
C227			CK73HB1E104K	CHIP C 0.10UF K		C417			CK73HB1E104K	CHIP C 0.10UF K	
C228			CC73HCH1H101J	CHIP C 100PF J		C418			CK73HB1H102K	CHIP C 1000PF K	
C229			CK73HB1H471K	CHIP C 470PF K		C419			CK73HB1H471K	CHIP C 470PF K	
C230			CC73HCH1H680J	CHIP C 68PF J		C421			CK73HB1H102K	CHIP C 1000PF K	
C231			CK73HB1H471K	CHIP C 470PF K		C422			CK73HB1E104K	CHIP C 0.10UF K	
C233,234			CC73HCH1H470J	CHIP C 47PF J		C423			CK73HB1H103K	CHIP C 0.010UF K	
C235,236			CK73HB1H471K	CHIP C 470PF K		C424-430			CK73HB1E104K	CHIP C 0.10UF K	

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TX-RX UNIT (X57-7952-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C437-440			CK73HB1E104K	CHIP C 0.10UF K		C638			CK73GB1E105K	CHIP C 1.0UF K	
C500-503			CK73HB1E104K	CHIP C 0.10UF K		C639			CK73HB1H103K	CHIP C 0.010UF K	
C504			CK73HB1H471K	CHIP C 470PF K		C641			CK73HB1H103K	CHIP C 0.010UF K	
C505-507			CK73HB1E104K	CHIP C 0.10UF K		C642			CK73HB1E104K	CHIP C 0.10UF K	
C508			CK73HB1H103K	CHIP C 0.010UF K		C643			CS77BA1D100M	CHIP TNTL 10UF 20WV	
C509-512			CK73HB1E104K	CHIP C 0.10UF K		C644			CC73HCH1H100D	CHIP C 10PF D	
C514			CK73HB1H103K	CHIP C 0.010UF K		C645			CK73GB1E105K	CHIP C 1.0UF K	
C515			CK73HB1E104K	CHIP C 0.10UF K		C647,648			CS77CA1V2R2M	CHIP TNTL 2.2UF 35WV	
C517			CK73HB1H103K	CHIP C 0.010UF K		C649			CK73HB1E104K	CHIP C 0.10UF K	
C518			CK73HB1E104K	CHIP C 0.10UF K		C650			CK73HB1H471K	CHIP C 470PF K	
C519			CK73HB1H103K	CHIP C 0.010UF K		C651			CC73HCH1H101J	CHIP C 100PF J	
C520			CK73HB1E104K	CHIP C 0.10UF K		C652			CC73HCH1H100D	CHIP C 10PF D	
C521			CC73HCH1H180J	CHIP C 18PF J		C653,654			CS77BA1D100M	CHIP TNTL 10UF 20WV	
C522			CC73HCH1H101J	CHIP C 100PF J		C655			CK73HB1H471K	CHIP C 470PF K	
C523			CC73HCH1H331J	CHIP C 330PF J		C656			CE32CL1V100M	CHIP EL 10UF 35WV	
C524			CC73HCH1H180J	CHIP C 18PF J		C657			CC73HCH1H330J	CHIP C 33PF J	
C525			CC73HCH1H470J	CHIP C 47PF J		C658			CK73HB1H471K	CHIP C 470PF K	
C526			CC73HCH1H471J	CHIP C 470PF J		C660			CC73HCH1H100D	CHIP C 10PF D	
C528			CC73HCH1H121J	CHIP C 120PF J		C661			CK73HB1E104K	CHIP C 0.10UF K	
C529			CC73HCH1H221J	CHIP C 220PF J		C662			CC73HCH1H070B	CHIP C 7.0PF B	
C530-533			CK73HB1E104K	CHIP C 0.10UF K		C663			CK73HB1H103K	CHIP C 0.010UF K	
C534			CC73HCH1H050C	CHIP C 5.0PF C		C664			CC73HCH1H3R5B	CHIP C 3.5PF B	
C535			CK73HB1H103K	CHIP C 0.010UF K		C671			CC73HCH1H040B	CHIP C 4.0PF B	
C536,537			CK73HB1E104K	CHIP C 0.10UF K		C672,673			CK73HB1H471K	CHIP C 470PF K	
C538			CK73HB1H103K	CHIP C 0.010UF K		C674			CC73HCH1H040B	CHIP C 4.0PF B	
C539			CC73HCH1H820J	CHIP C 82PF J		C677			CC73HCH1H060B	CHIP C 6.0PF B	
C540			CK73HB1H103K	CHIP C 0.010UF K		C679,680			CK73HB1H471K	CHIP C 470PF K	
C541			CK73HB1E104K	CHIP C 0.10UF K		C683-688			CK73HB1H471K	CHIP C 470PF K	
C542			CK73FB1A106K	CHIP C 10UF K		C700			CK73HB1H103K	CHIP C 0.010UF K	
C543-545			CK73HB1E104K	CHIP C 0.10UF K		C701			C92-0905-05	OS-CON 47UF 35WV	
C546			CC73HCH1H390J	CHIP C 39PF J		C702			CK73GB1E105K	CHIP C 1.0UF K	
C547,548			CC73HCH1H100D	CHIP C 10PF D		C703			CK73HB1H471K	CHIP C 470PF K	
C549			CK73HB1E104K	CHIP C 0.10UF K		C704			CK73GB1E105K	CHIP C 1.0UF K	
C550			CK73HB1H103K	CHIP C 0.010UF K		C705			CK73HB1H471K	CHIP C 470PF K	
C600,601			CK73FB1A106K	CHIP C 10UF K		C706			C92-0765-05	CHIP TNTL 4.7UF 16WV	
C602-604			CK73HB1E104K	CHIP C 0.10UF K		C707			CE32CL1V100M	CHIP EL 10UF 35WV	
C605			CK73HB1H103K	CHIP C 0.010UF K		C708			CK73HB1E104K	CHIP C 0.10UF K	
C606,607			CK73FB1A106K	CHIP C 10UF K		C709			CK73HB1H103K	CHIP C 0.010UF K	
C608			CK73HB1H103K	CHIP C 0.010UF K		C710,711			CK73HB1H471K	CHIP C 470PF K	
C610-613			CK73HB1H103K	CHIP C 0.010UF K		C712			CK73GB1E105K	CHIP C 1.0UF K	
C614			CS77BA1D100M	CHIP TNTL 10UF 20WV		C713			CK73HB1H471K	CHIP C 470PF K	
C615			CC73HCH1H181J	CHIP C 180PF J		C714			CC73HCH1H181J	CHIP C 180PF J	
C616			CC73HCH1H470J	CHIP C 47PF J		C715			CK73HB1H471K	CHIP C 470PF K	
C618			CS77CB21A470M	CHIP TNTL 47UF 10WV		C716			CE32CL1V100M	CHIP EL 10UF 35WV	
C619			CC73HCH1H331J	CHIP C 330PF J		C717			CC73HCH1H220J	CHIP C 22PF J	
C620			CC73HCH1H180J	CHIP C 18PF J		C718			CK73HB1H471K	CHIP C 470PF K	
C621			CS77CB21A470M	CHIP TNTL 47UF 10WV		C719			CK73GB1E105K	CHIP C 1.0UF K	
C622			CC73HCH1H221J	CHIP C 220PF J		C720			CK73HB1E104K	CHIP C 0.10UF K	
C623			CK73HB1H103K	CHIP C 0.010UF K		C721			CK73GB1E105K	CHIP C 1.0UF K	
C624			CK73HB1E104K	CHIP C 0.10UF K		C722,723			CK73HB1E104K	CHIP C 0.10UF K	
C625			CK73HB1H103K	CHIP C 0.010UF K		C724,725			CK73GB1E105K	CHIP C 1.0UF K	
C626			CS77BA1D100M	CHIP TNTL 10UF 20WV		C726			CK73HB1H103K	CHIP C 0.010UF K	
C627			CK73HB1H103K	CHIP C 0.010UF K		C727			CK73GB1E105K	CHIP C 1.0UF K	
C628			CC73HCH1H100D	CHIP C 10PF D		C728,729			CK73HB1H471K	CHIP C 470PF K	
C629,630			CK73HB1H103K	CHIP C 0.010UF K		C814			CC73HCH1H101J	CHIP C 100PF J	
C631			CC73HCH1H100D	CHIP C 10PF D		C815			CK73HB1H103K	CHIP C 0.010UF K	
C632			CK73HB1E104K	CHIP C 0.10UF K		C817,818			CK73HB1E104K	CHIP C 0.10UF K	
C633,634			CK73HB1H103K	CHIP C 0.010UF K		C819			CK73HB1H103K	CHIP C 0.010UF K	
C635			CC73HCH1H100D	CHIP C 10PF D		C820			CK73HB1H471K	CHIP C 470PF K	
C636,637			CK73HB1H103K	CHIP C 0.010UF K		C821			CK73HB1E104K	CHIP C 0.10UF K	

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### TX-RX UNIT (X57-7952-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C822			CC73HCH1H100D	CHIP C 10PF D		L317			L41-1095-33	SMALL FIXED INDUCTOR (1.0UH)	
C823			CK73HB1E104K	CHIP C 0.10UF K		L320			L40-1885-92	SMALL FIXED INDUCTOR (180NH)	
C825			C93-0912-05	CHIP C 100UF M		L500			L41-3395-33	SMALL FIXED INDUCTOR (3.3UH)	
C826			CK73GB1E105K	CHIP C 1.0UF K		L501			L41-4795-33	SMALL FIXED INDUCTOR (4.7UH)	
C827			CK73HB1H471K	CHIP C 470PF K		L502			L41-6885-33	SMALL FIXED INDUCTOR (0.68UH)	
C828			CK73HB1E104K	CHIP C 0.10UF K		L503			L41-5685-33	SMALL FIXED INDUCTOR (0.56UH)	
C831			CK73HB1E104K	CHIP C 0.10UF K		L504			L41-2295-33	SMALL FIXED INDUCTOR (2.2UH)	
C832			CC73HCH1H050B	CHIP C 5.0PF B		L505,506			L41-1295-33	SMALL FIXED INDUCTOR (1.2UH)	
CN101			E04-0154-05	PIN SOCKET		L507,508			L41-3305-33	SMALL FIXED INDUCTOR (33UH)	
CN102			E23-1330-05	TERMINAL		L600,601			L41-1005-33	SMALL FIXED INDUCTOR (10UH)	
CN106			E23-1330-05	TERMINAL		L602			L92-0467-05	CHIP FERRITE	
CN500			E04-0154-05	PIN SOCKET		L603			L41-1005-33	SMALL FIXED INDUCTOR (10UH)	
CN610			E04-0154-05	PIN SOCKET		L604			L41-3385-39	SMALL FIXED INDUCTOR (0.33UH)	
CN700,701			E41-2672-05	PIN ASSY		L605			L41-3985-39	SMALL FIXED INDUCTOR (0.39UH)	
CN800			E40-6656-05	PIN ASSY		L606			L41-1095-39	SMALL FIXED INDUCTOR (1.0UH)	
CN801			E41-2743-05	PIN ASSY		L607,608			L41-1878-14	SMALL FIXED INDUCTOR (18NH)	
CN802			E04-0193-05	PIN SOCKET		L609			L41-1278-14	SMALL FIXED INDUCTOR (12NH)	
CN807-809			E23-1278-05	TERMINAL		L610			L41-2778-14	SMALL FIXED INDUCTOR (27NH)	
CN811-813			E23-1278-05	TERMINAL		L611			L41-1578-14	SMALL FIXED INDUCTOR (15NH)	
-			F10-2409-04	SHIELDING CASE		L613,614			L92-0639-05	CHIP FERRITE	
F700			F53-0328-15	FUSE (5A)		L615-617			L92-0467-05	CHIP FERRITE	
-			G11-4359-04	SHEET		L700			L33-1462-05	SMALL FIXED INDUCTOR (68UH)	
-			G11-4368-04	SHEET		L701,702			L41-1005-33	SMALL FIXED INDUCTOR (10UH)	
CF400,401			L72-1028-05	CERAMIC FILTER		L800,801			L92-0467-05	CHIP FERRITE	
CF402			L72-1027-05	CERAMIC FILTER		L803			L92-0162-05	BEADS CORE	
CF403			L72-1041-05	CERAMIC FILTER		L804			L41-1285-14	SMALL FIXED INDUCTOR (120NH)	
L100,101			L34-4565-05	AIR-CORE COIL		L805,806			L92-0467-05	CHIP FERRITE	
L103,104			L34-4565-05	AIR-CORE COIL		X500			L77-3034-05	TCXO (19.2MHZ)	
L106			L92-0467-05	CHIP FERRITE		X600			L77-1960-15	VCXO (16.8MHZ)	
L107			L41-1278-14	SMALL FIXED INDUCTOR (12NH)		XF300			L71-0649-05	MCF (58.05MHZ)	
L109			L41-6868-14	SMALL FIXED INDUCTOR (6.8NH)		R100			RK73GB2A102J	CHIP R 1.0K J 1/10W	
L111,112			L34-4565-05	AIR-CORE COIL		R101			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L114-118			L34-4565-05	AIR-CORE COIL		R105,106			RK73HB1J104J	CHIP R 100K J 1/16W	
L119			L34-4616-05	AIR-CORE COIL		R107			RK73HB1J103J	CHIP R 10K J 1/16W	
L120,121			L41-1878-14	SMALL FIXED INDUCTOR (18NH)		R109,110			RK73HB1J104J	CHIP R 100K J 1/16W	
L200,201			L41-2778-14	SMALL FIXED INDUCTOR (27NH)		R111			RK73HB1J101J	CHIP R 100 J 1/16W	
L203			L41-5685-14	SMALL FIXED INDUCTOR (560NH)		R112			RK73HB1J104J	CHIP R 100K J 1/16W	
L205			L41-4778-14	SMALL FIXED INDUCTOR (47NH)		R113			RK73HB1J103J	CHIP R 10K J 1/16W	
L206			L41-1085-33	SMALL FIXED INDUCTOR (0.1UH)		R114			RK73HB1J101J	CHIP R 100 J 1/16W	
L207			L41-2278-14	SMALL FIXED INDUCTOR (22NH)		R115			RK73FB2B121J	CHIP R 120 J 1/8W	
L209			L41-1575-33	SMALL FIXED INDUCTOR (0.015UH)		R116			RK73HB1J103J	CHIP R 10K J 1/16W	
L210			L41-1875-33	SMALL FIXED INDUCTOR (0.018UH)		R117			RK73HB1J100J	CHIP R 10 J 1/16W	
L211			L41-3378-14	SMALL FIXED INDUCTOR (33NH)		R118			RK73HB1J274J	CHIP R 270K J 1/16W	
L212			L92-0467-05	CHIP FERRITE		R119			RK73HB1J393J	CHIP R 39K J 1/16W	
L214			L92-0467-05	CHIP FERRITE		R120			RK73HB1J122J	CHIP R 1.2K J 1/16W	
L215			L92-0163-05	BEADS CORE		R121			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L300			L92-0467-05	CHIP FERRITE		R122			RK73HB1J221J	CHIP R 220 J 1/16W	
L301			L40-3381-86	SMALL FIXED INDUCTOR (0.33UH)		R125			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L302			L41-5685-47	SMALL FIXED INDUCTOR (560NH)		R126			RK73HB1J103J	CHIP R 10K J 1/16W	
L303			L41-3985-47	SMALL FIXED INDUCTOR (390NH)		R128,129			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L304,305			L41-1578-14	SMALL FIXED INDUCTOR (15NH)		R130			RK73HB1J274J	CHIP R 270K J 1/16W	
L308			L41-2278-14	SMALL FIXED INDUCTOR (22NH)		R131			RK73HB1J393J	CHIP R 39K J 1/16W	
L309			L41-6878-14	SMALL FIXED INDUCTOR (68NH)		R132-136			RK73HB1J104J	CHIP R 100K J 1/16W	
L310			L41-2785-47	SMALL FIXED INDUCTOR (270NH)		R137			RK73HB1J4R7J	CHIP R 4.7 J 1/16W	
L312			L41-1078-14	SMALL FIXED INDUCTOR (10NH)		R138,139			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L313			L40-8275-92	SMALL FIXED INDUCTOR (82NH)		R140			RK73HB1J220J	CHIP R 22 J 1/16W	
L315			L41-1078-14	SMALL FIXED INDUCTOR (10NH)		R200			RK73HB1J223J	CHIP R 22K J 1/16W	
L316			L40-2785-92	SMALL FIXED INDUCTOR (270NH)		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	

## PARTS LIST / 零件表

TX-RX UNIT (X57-7952-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R205			RK73HB1J102J	CHIP R 1.0K J 1/16W		R413			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R206			RK73HB1J334J	CHIP R 330K J 1/16W		R415			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R207			RK73HB1J393J	CHIP R 39K J 1/16W		R416			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R208			RK73HB1J000J	CHIP R 0.0 J 1/16W		R417,418			RK73HB1J220J	CHIP R 22 J 1/16W	
R209			RK73HB1J102J	CHIP R 1.0K J 1/16W		R420			RK73HB1J470J	CHIP R 47 J 1/16W	
R210			RK73HB1J124J	CHIP R 120K J 1/16W		R421			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R211			RK73HB1J333J	CHIP R 33K J 1/16W		R422			RK73HB1J101J	CHIP R 100 J 1/16W	
R212			RK73HB1J394J	CHIP R 390K J 1/16W		R425			RK73HB1J183J	CHIP R 18K J 1/16W	
R213			RK73HB1J106J	CHIP R 10M J 1/16W		R426			RK73HB1J822J	CHIP R 8.2K J 1/16W	
R214			RK73HB1J000J	CHIP R 0.0 J 1/16W		R427,428			RK73HB1J473J	CHIP R 47K J 1/16W	
R215,216			RK73HB1J102J	CHIP R 1.0K J 1/16W		R429			RK73HB1J220J	CHIP R 22 J 1/16W	
R220,221			RK73HB1J101J	CHIP R 100 J 1/16W		R431			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R223			RK73HB1J331J	CHIP R 330 J 1/16W		R433-435			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R224			RK73HB1J220J	CHIP R 22 J 1/16W		R436-438			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R225			RK73HB1J334J	CHIP R 330K J 1/16W		R442,443			RK73HB1J821J	CHIP R 820 J 1/16W	
R227			RK73HB1J220J	CHIP R 22 J 1/16W		R444			RK73HB1J122J	CHIP R 1.2K J 1/16W	
R228,229			RK73HB1J000J	CHIP R 0.0 J 1/16W		R447			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R230			RK73HB1J271J	CHIP R 270 J 1/16W		R448,449			RK73HB1J334J	CHIP R 330K J 1/16W	
R231			RK73HB1J180J	CHIP R 18 J 1/16W		R450			RK73HB1J563J	CHIP R 56K J 1/16W	
R232			RK73HB1J271J	CHIP R 270 J 1/16W		R451			RK73HB1J104J	CHIP R 100K J 1/16W	
R233			RK73HB1J472J	CHIP R 4.7K J 1/16W		R452			RK73HB1J224J	CHIP R 220K J 1/16W	
R234			RK73HB1J182J	CHIP R 1.8K J 1/16W		R453			RK73HB1J220J	CHIP R 22 J 1/16W	
R235			RK73HB1J220J	CHIP R 22 J 1/16W		R500			RK73HB1J104J	CHIP R 100K J 1/16W	
R236			RK73HB1J102J	CHIP R 1.0K J 1/16W		R501,502			RK73HB1J104D	CHIP R 100K D 1/16W	
R237			RK73HB1J680J	CHIP R 68 J 1/16W		R503			RK73HB1J101J	CHIP R 100 J 1/16W	
R238,239			RK73HB1J000J	CHIP R 0.0 J 1/16W		R504			RK73HB1J220J	CHIP R 22 J 1/16W	
R243			RK73HB1J271J	CHIP R 270 J 1/16W		R505			RK73HB1J124J	CHIP R 120K J 1/16W	
R244			RK73HB1J180J	CHIP R 18 J 1/16W		R506			RK73HB1J471J	CHIP R 470 J 1/16W	
R245			RK73HB1J271J	CHIP R 270 J 1/16W		R507			RK73HB1J220J	CHIP R 22 J 1/16W	
R246			RK73HB1J221J	CHIP R 220 J 1/16W		R509			RK73HB1J183J	CHIP R 18K J 1/16W	
R247			RK73HB1J103J	CHIP R 10K J 1/16W		R510			RK73HB1J223J	CHIP R 22K J 1/16W	
R300			RK73HB1J331J	CHIP R 330 J 1/16W		R511			RK73HB1J220J	CHIP R 22 J 1/16W	
R301			RK73HB1J101J	CHIP R 100 J 1/16W		R512			RK73HB1J223J	CHIP R 22K J 1/16W	
R302			RK73HB1J473J	CHIP R 47K J 1/16W		R513			RK73HB1J471J	CHIP R 470 J 1/16W	
R303			RK73HB1J220J	CHIP R 22 J 1/16W		R514			RK73HB1J220J	CHIP R 22 J 1/16W	
R304			RK73HB1J104J	CHIP R 100K J 1/16W		R515			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R305			RK73HB1J123J	CHIP R 12K J 1/16W		R516			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R306			RK73HB1J103J	CHIP R 10K J 1/16W		R518			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R310			RK73HB1J122J	CHIP R 1.2K J 1/16W		R519			RK73HB1J181J	CHIP R 180 J 1/16W	
R311			RK73GB2A220J	CHIP R 22 J 1/10W		R520			RK73HB1J394J	CHIP R 390K J 1/16W	
R312			RK73HB1J220J	CHIP R 22 J 1/16W		R521			RK73HB1J154J	CHIP R 150K J 1/16W	
R313			RK73HB1J272J	CHIP R 2.7K J 1/16W		R522			RK73HB1J333J	CHIP R 33K J 1/16W	
R314			RK73HB1J103J	CHIP R 10K J 1/16W		R523			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R315			RK73GB2A101J	CHIP R 100 J 1/10W		R524			RK73HB1J104J	CHIP R 100K J 1/16W	
R316			RK73GB2A100J	CHIP R 10 J 1/10W		R525			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R318			RK73HB1J220J	CHIP R 22 J 1/16W		R527			RK73HB1J104J	CHIP R 100K J 1/16W	
R320			RK73HB1J100J	CHIP R 10 J 1/16W		R528			RK73HB1J224J	CHIP R 220K J 1/16W	
R323			RK73HB1J181J	CHIP R 180 J 1/16W		R529			RK73HB1J104J	CHIP R 100K J 1/16W	
R332			RK73HB1J470J	CHIP R 47 J 1/16W		R530			RK73HB1J471J	CHIP R 470 J 1/16W	
R400			RK73HB1J224J	CHIP R 220K J 1/16W		R531,532			RK73HB1J103J	CHIP R 10K J 1/16W	
R401			RK73HB1J220J	CHIP R 22 J 1/16W		R533			RK73HB1J220J	CHIP R 22 J 1/16W	
R402			RK73HB1J101J	CHIP R 100 J 1/16W		R534			RK73HB1J682J	CHIP R 6.8K J 1/16W	
R403			RK73HB1J682J	CHIP R 6.8K J 1/16W		R535			RK73HB1J104J	CHIP R 100K J 1/16W	
R404			RK73HB1J000J	CHIP R 0.0 J 1/16W		R536			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R405			RK73HB1J103J	CHIP R 10K J 1/16W		R537			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R406			RK73HB1J220J	CHIP R 22 J 1/16W		R538			RK73HB1J221J	CHIP R 220 J 1/16W	
R407			RK73HB1J474J	CHIP R 470K J 1/16W		R539,540			RK73HB1J104J	CHIP R 100K J 1/16W	
R408			RK73HB1J103J	CHIP R 10K J 1/16W		R541			RK73HB1J101J	CHIP R 100 J 1/16W	
R409-411			RK73HB1J473J	CHIP R 47K J 1/16W		R542			RK73HB1J104J	CHIP R 100K J 1/16W	
R412			RK73HB1J101J	CHIP R 100 J 1/16W		R543			RK73HB1J221J	CHIP R 220 J 1/16W	

## PARTS LIST / 零件表

## TX-RX UNIT (X57-7952-71)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
R544			RK73HB1J104J	CHIP R 100K J 1/16W		R666			RK73HB1J101J	CHIP R 100 J 1/16W	
R545,546			RK73HB1J120J	CHIP R 12 J 1/16W		R668			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R547-550			RK73HB1J182J	CHIP R 1.8K J 1/16W		R669			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R551			RK73HB1J101J	CHIP R 100 J 1/16W		R670			RK73HB1J181J	CHIP R 180 J 1/16W	
R552			RK73HB1J102J	CHIP R 1.0K J 1/16W		R671			RK73HB1J220J	CHIP R 22 J 1/16W	
R602			RK73HB1J101J	CHIP R 100 J 1/16W		R680			RK73HB1J821J	CHIP R 820 J 1/16W	
R604			RK73HB1J104J	CHIP R 100K J 1/16W		R681			RK73HB1J5R6J	CHIP R 5.6 J 1/16W	
R605			RK73HB1J000J	CHIP R 0.0 J 1/16W		R682			RK73HB1J821J	CHIP R 820 J 1/16W	
R606-608			RK73HB1J104J	CHIP R 100K J 1/16W		R683-685			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R609			RK73HB1J472J	CHIP R 4.7K J 1/16W		R686,687			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R610			RK73HB1J000J	CHIP R 0.0 J 1/16W		R688			RK73HB1J330J	CHIP R 33 J 1/16W	
R611			RK73HB1J101J	CHIP R 100 J 1/16W		R689,690			RK73HB1J181J	CHIP R 180 J 1/16W	
R612			RK73HB1J470J	CHIP R 47 J 1/16W		R700			RK73HB1J330J	CHIP R 33 J 1/16W	
R613			RK73HB1J000J	CHIP R 0.0 J 1/16W		R701			RK73HB1J100J	CHIP R 10 J 1/16W	
R614			RK73HB1J223J	CHIP R 22K J 1/16W		R702			RK73HB1J473J	CHIP R 47K J 1/16W	
R615			RK73HB1J273J	CHIP R 27K J 1/16W		R703			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R616			RK73HB1J103J	CHIP R 10K J 1/16W		R704			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R617			RK73HB1J154J	CHIP R 150K J 1/16W		R705			RK73HB1J104J	CHIP R 100K J 1/16W	
R618			RK73HB1J101J	CHIP R 100 J 1/16W		R706			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R619			RK73HB1J221J	CHIP R 220 J 1/16W		R707			RK73HB1J154J	CHIP R 150K J 1/16W	
R620			RK73HB1J000J	CHIP R 0.0 J 1/16W		R708,709			RK73HB1J473J	CHIP R 47K J 1/16W	
R621			RK73HB1J220J	CHIP R 22 J 1/16W		R710			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R622			RK73HB1J103J	CHIP R 10K J 1/16W		R711			RK73HB1J123J	CHIP R 12K J 1/16W	
R623			RK73HB1J562J	CHIP R 5.6K J 1/16W		R712			RK73HB1J474J	CHIP R 470K J 1/16W	
R624			RK73HB1J104J	CHIP R 100K J 1/16W		R713			RK73HB1J334D	CHIP R 330K D 1/16W	
R625			RK73HB1J221J	CHIP R 220 J 1/16W		R714			RK73HB1J223D	CHIP R 22K D 1/16W	
R626			RK73HB1J472J	CHIP R 4.7K J 1/16W		R715-717			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R627			RK73HB1J220J	CHIP R 22 J 1/16W		R800-803			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R628			RK73HB1J471J	CHIP R 470 J 1/16W		R806-815			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R629,630			RK73HB1J104J	CHIP R 100K J 1/16W		R816,817			RK73HB1J101J	CHIP R 100 J 1/16W	
R631			RK73HB1J822J	CHIP R 8.2K J 1/16W		R818			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R632			RK73HB1J182J	CHIP R 1.8K J 1/16W		R819			RK73HB1J683J	CHIP R 68K J 1/16W	
R633			RK73HB1J220J	CHIP R 22 J 1/16W		R820			RK73HB1J473J	CHIP R 47K J 1/16W	
R634			RK73HB1J473J	CHIP R 47K J 1/16W		R821			RK73HB1J394J	CHIP R 390K J 1/16W	
R635			RK73GB2A2R2J	CHIP R 2.2 J 1/10W		R822			RK73HB1J104J	CHIP R 100K J 1/16W	
R636			RK73HB1J104J	CHIP R 100K J 1/16W		R824,825			RK73HB1J101J	CHIP R 100 J 1/16W	
R637			RK73HB1J473J	CHIP R 47K J 1/16W		R826			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R638			RK73HB1J220J	CHIP R 22 J 1/16W		R827			RK73HB1J103J	CHIP R 10K J 1/16W	
R639			RK73HB1J000J	CHIP R 0.0 J 1/16W		R828			RK73HB1J224J	CHIP R 220K J 1/16W	
R640			RK73HB1J102J	CHIP R 1.0K J 1/16W		R829			RK73HB1J220J	CHIP R 22 J 1/16W	
R641			RK73HB1J000J	CHIP R 0.0 J 1/16W		R830			RK73HB1J334J	CHIP R 330K J 1/16W	
R642,643			RK73HB1J104J	CHIP R 100K J 1/16W		R831			RK73HB1J563J	CHIP R 56K J 1/16W	
R644			RK73HB1J103J	CHIP R 10K J 1/16W		R832			RK73HB1J683J	CHIP R 68K J 1/16W	
R645			RK73HB1J220J	CHIP R 22 J 1/16W		R833-835			RK73HB1J101J	CHIP R 100 J 1/16W	
R646			RK73HB1J000J	CHIP R 0.0 J 1/16W		R837			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R647			RK73HB1J102J	CHIP R 1.0K J 1/16W		R838			RK73HB1J101J	CHIP R 100 J 1/16W	
R648			RK73HB1J274J	CHIP R 270K J 1/16W		R840,841			RK73HB1J101J	CHIP R 100 J 1/16W	
R649			RK73HB1J000J	CHIP R 0.0 J 1/16W		R842-849			RK73HB1J104J	CHIP R 100K J 1/16W	
R650-652			RK73HB1J102J	CHIP R 1.0K J 1/16W		R850,851			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R653			RK73HB1J124J	CHIP R 120K J 1/16W		R853			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R654			RK73HB1J333J	CHIP R 33K J 1/16W		R855			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R655			RK73HB1J394J	CHIP R 390K J 1/16W		R856			RK73GB2A220J	CHIP R 22 J 1/10W	
R656			RK73HB1J106J	CHIP R 10M J 1/16W		R858			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R657			RK73HB1J223J	CHIP R 22K J 1/16W		R860			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R658			RK73HB1J103J	CHIP R 10K J 1/16W		D100,101		1SV283F		VARIABLE CAPACITANCE DIODE	
R659			RK73HB1J224J	CHIP R 220K J 1/16W		D103-108		1SV283F		VARIABLE CAPACITANCE DIODE	
R660			RK73HB1J334J	CHIP R 330K J 1/16W		D200		DA221		DIODE	
R661			RK73HB1J393J	CHIP R 39K J 1/16W		D500,501		UDZS3.0B		ZENER DIODE	
R663			RK73HB1J000J	CHIP R 0.0 J 1/16W		D503		HSM88AS-E		DIODE	
R665			RK73HB1J000J	CHIP R 0.0 J 1/16W							



## PARTS LIST / 零件表

TX-RX UNIT (X57-7952-71)  
RX VCO/PLL UNIT (X58-5090-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
D504,505			JDP4P02AT	DIODE		Q703			RT1N141M-T111	TRANSISTOR	
D600			DA221	DIODE		Q704			SSM5H01TU-F	FET	
D601			HVC131	DIODE		Q705			CPH3317	FET	
D801			1SS388F	DIODE		Q706			SSM3K15TE(F)	FET	
IC100,101			LMC7101BIM5	MOS-IC		Q800			SSM3K15TE(F)	FET	
IC200			TC75W51FK(F)	MOS-IC		<b>RX VCO/PLL UNIT (X58-5090-10)</b>					
IC201			LMC7101BIM5	MOS-IC		C300			CS77CA1VR15M	CHIP TNTL	0.15UF 35WV
IC203			TC7SH126FU-F	MOS-IC		C303			CS77BA1D100M	CHIP TNTL	10UF 20WV
IC300			ADL5350ACPZ	MOS-IC		C304			CC73GCH1H100C	CHIP C	10PF C
IC400			AD8051ART	ANALOGUE IC		C306			CC73GCH1H100C	CHIP C	10PF C
IC401			TC75W51FK(F)	MOS-IC		C307			CS77CA1V0R1M	CHIP TNTL	0.1UF 35WV
IC402			LMC7101BIM5	MOS-IC		C308-310			CK73HB1E103K	CHIP C	0.010UF K
IC403			NJM2287V	MOS-IC		C311			CK73HB1H471K	CHIP C	470PF K
IC404			MCP6021-E/OT	MOS-IC		C312			CC73GCH1H070B	CHIP C	7.0PF B
IC405-408			TC7W53FK(F)	MOS-IC		C313			CC73HCH1H101J	CHIP C	100PF J
IC409			TC75W51FK(F)	MOS-IC		C314			CS77BA1E010M	CHIP TNTL	1.0UF 25WV
IC500			TC75W51FK(F)	MOS-IC		C315,316			CC73HCH1H101J	CHIP C	100PF J
IC501			TC75S59F-F	MOS-IC		C317			CK73HB1E103K	CHIP C	0.010UF K
IC600,601			TC7WH126FU-F	MOS-IC		C318			CC73HCH1H101J	CHIP C	100PF J
IC602			ADF4001BRUZ	MOS-IC		C320-322			CC73HCH1H101J	CHIP C	100PF J
IC603			TC75S51FE(F)	MOS-IC		C324			CC73HCH1H101J	CHIP C	100PF J
IC604			LMC7101BIM5	MOS-IC		C325			CC73GCH1H120G	CHIP C	12PF G
IC605			TC75S51FE(F)	MOS-IC		C326			CC73HCH1H101J	CHIP C	100PF J
IC606,607			LMC7101BIM5	MOS-IC		C328			CC73GCH1H070B	CHIP C	7.0PF B
IC608			TC75W51FK(F)	MOS-IC		C329			CK73HB1H471K	CHIP C	470PF K
IC700			NJM78M05DL1AZB	ANALOGUE IC		C330			CC73HCH1H040B	CHIP C	4.0PF B
IC701			XC9101D09AKR	ANALOGUE IC		C331			CK73HB1H471K	CHIP C	470PF K
IC702			NJM78M08FA-ZB	ANALOGUE IC		C332			CC73HCH1H100C	CHIP C	10PF C
IC703			TK71733S	BI-POLAR IC		C333			CK73HB1E103K	CHIP C	0.010UF K
IC704			TK11230CMCL-G	BI-POLAR IC		C335			CC73HCH1H101J	CHIP C	100PF J
IC800			LM73CIMKX-0	MOS-IC		C352,353			CC73HCH1H101J	CHIP C	100PF J
IC801			TC75S51FE(F)	MOS-IC		C354,355			CC73GCH1H390J	CHIP C	39PF J
IC802			M24C02-RMN6TP	ROM IC		C356,357			CK73HB1H471K	CHIP C	470PF K
IC803			TC75W51FK(F)	MOS-IC		C358,359			CK73HB1E103K	CHIP C	0.010UF K
IC804			M62364FP-F	MOS-IC		C360,361			CK73HB1H471K	CHIP C	470PF K
IC805			MCP23S08TE/ML	MOS-IC		C362			CC73GCH1H270J	CHIP C	27PF J
IC806			TC7W53FK(F)	MOS-IC		C363			CC73GCH1H180G	CHIP C	18PF G
Q100			2SC5383-T111	TRANSISTOR		C364			CC73GCH1H060B	CHIP C	6.0PF B
Q101			2SC5337	TRANSISTOR		C365			CC73GCH1H040B	CHIP C	4.0PF B
Q200,201			2SC5383-T111	TRANSISTOR		C366,367			CK73HB1H471K	CHIP C	470PF K
Q202,203			2SC5636	TRANSISTOR		C368			CC73GCH1H100C	CHIP C	10PF C
Q300			3SK294-FP	FET		C369			CC73GCH1H080B	CHIP C	8.0PF B
Q301			2SC5337	TRANSISTOR		C370			CC73GCH1H060B	CHIP C	6.0PF B
Q500			SSM6L05FU-F	FET		C371			CC73GCH1H050B	CHIP C	5.0PF B
Q501			2SC4617(R)	TRANSISTOR		C372			CC73GCH1H040B	CHIP C	4.0PF B
Q502			2SK3737-5	FET		C373			CC73GCH1H030B	CHIP C	3.0PF B
Q503			3SK294-FP	FET		C374,375			CC73GCH1H0R5B	CHIP C	0.5PF B
Q504			2SC4617(R)	TRANSISTOR		C376,377			CK73HB1H471K	CHIP C	470PF K
Q505			SSM3K15TE(F)	FET		C378			CC73HCH1H040C	CHIP C	4.0PF C
Q506			SSM6L05FU-F	FET		C379			C93-0787-05	CHIP C	0.1UF J
Q507			UPA672T-A	FET		C380,381			CC73GCH1H020B	CHIP C	2.0PF B
Q600			SSM3K15TE(F)	FET		C382,383			CC73GCH1H050B	CHIP C	5.0PF B
Q601			2SA1832(GRJF)	TRANSISTOR		CN303			E40-5816-05	PIN ASSY	
Q602,603			2SC4617(R)	TRANSISTOR		CN350			E40-6860-05	PIN ASSY	
Q604,605			2SC5383-T111	TRANSISTOR		CN351			E40-6098-05	PIN ASSY	
Q606			2SC5636	TRANSISTOR		-			F10-2377-04	SHIELDING CASE	
Q607			SSM3K15TE(F)	FET							
Q700			CPH3317	FET							
Q701			SSM3K15TE(F)	FET							
Q702			2SJ506-E(S)	FET							

# NXR-810

## PARTS LIST / 零件表

RX VCO/PLL UNIT (X58-5090-10)  
TX VCO/PLL UNIT (X58-5100-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
L300			L92-0163-05	BEADS CORE		IC300			SKY72300-362	MOS-IC	
L303			L41-1295-33	SMALL FIXED INDUCTOR (1.2UH)		Q300			2SC5636	TRANSISTOR	
L305,306			L92-0163-05	BEADS CORE		Q350,351			SSM6L05FU-F	FET	
L309			L41-2278-14	SMALL FIXED INDUCTOR (22NH)		Q352,353			MCH3914(8)-H	FET	
L310			L92-0163-05	BEADS CORE		Q354			2SC5636	TRANSISTOR	
L312,313			L92-0163-05	BEADS CORE		<b>TX VCO/PLL UNIT (X58-5100-10)</b>					
L315			L41-3378-14	SMALL FIXED INDUCTOR (33NH)		C300			C92-0863-05	CHIP TNTL	0.047UF 35WV
L316			L41-2278-14	SMALL FIXED INDUCTOR (22NH)		C303			CS77BA1D100M	CHIP TNTL	10UF 20WV
L350-357			L41-1095-33	SMALL FIXED INDUCTOR (1.0UH)		C304			CC73GCH1H100C	CHIP C	10PF C
L358,359			L34-4607-15	AIR-CORE COIL		C306			CC73GCH1H100C	CHIP C	10PF C
L360,361			L41-1098-40	SMALL FIXED INDUCTOR (1000NH)		C307			CS77CA1VR15M	CHIP TNTL	0.15UF 35WV
L362,363			L41-1095-33	SMALL FIXED INDUCTOR (1.0UH)		C308-310			CK73HB1E103K	CHIP C	0.010UF K
L364			L41-2275-33	SMALL FIXED INDUCTOR (0.022UH)		C311			CK73HB1H471K	CHIP C	470PF K
L365,366			L92-0163-05	BEADS CORE		C312			CC73GCH1H120G	CHIP C	12PF G
R301			RK73GB2A391J	CHIP R 390 J 1/10W		C313			CC73HCH1H101J	CHIP C	100PF J
R302			RK73GB2A151J	CHIP R 150 J 1/10W		C314			CS77BA1E010M	CHIP TNTL	1.0UF 25WV
R303			RK73GB2A000J	CHIP R 0.0 J 1/10W		C315,316			CC73HCH1H101J	CHIP C	100PF J
R304			RK73HB1J472J	CHIP R 4.7K J 1/16W		C317			CK73HB1E103K	CHIP C	0.010UF K
R305			RK73GB2A000J	CHIP R 0.0 J 1/10W		C318			CC73HCH1H101J	CHIP C	100PF J
R306			RK73HB1J100J	CHIP R 10 J 1/16W		C320-322			CC73HCH1H101J	CHIP C	100PF J
R307			RK73HB1J470J	CHIP R 47 J 1/16W		C323			CC73GCH1H030B	CHIP C	3.0PF B
R308			RK73HB1J100J	CHIP R 10 J 1/16W		C324			CC73HCH1H101J	CHIP C	100PF J
R310			RK73HB1J102J	CHIP R 1.0K J 1/16W		C326			CC73HCH1H101J	CHIP C	100PF J
R311			RK73HB1J100J	CHIP R 10 J 1/16W		C328			CC73GCH1H120G	CHIP C	12PF G
R312			RK73HB1J330J	CHIP R 33 J 1/16W		C329			CK73HB1H471K	CHIP C	470PF K
R313			RK73HB1J103J	CHIP R 10K J 1/16W		C330			CC73HCH1H3R5B	CHIP C	3.5PF B
R314			RK73HB1J472J	CHIP R 4.7K J 1/16W		C331,332			CK73HB1H471K	CHIP C	470PF K
R315			RK73HB1J101J	CHIP R 100 J 1/16W		C333			CK73HB1E103K	CHIP C	0.010UF K
R316			RK73HB1J100J	CHIP R 10 J 1/16W		C335			CC73HCH1H101J	CHIP C	100PF J
R317			RK73HB1J101J	CHIP R 100 J 1/16W		C350			C93-0787-05	CHIP C	0.1UF J
R318			RK73HB1J121J	CHIP R 120 J 1/16W		C354,355			CK73GB1H471K	CHIP C	470PF K
R319			RK73HB1J151J	CHIP R 150 J 1/16W		C356,357			CK73HB1H471K	CHIP C	470PF K
R320			RK73HB1J223J	CHIP R 22K J 1/16W		C358,359			CK73HB1E103K	CHIP C	0.010UF K
R321			RK73HB1J103J	CHIP R 10K J 1/16W		C360,361			CK73HB1H471K	CHIP C	470PF K
R322			RK73HB1J8R2J	CHIP R 8.2 J 1/16W		C362,363			CC73GCH1H120J	CHIP C	12PF J
R323			RK73HB1J151J	CHIP R 150 J 1/16W		C364			CC73GCH1H0R5B	CHIP C	0.5PF B
R324			RK73HB1J8R2J	CHIP R 8.2 J 1/16W		C365			CC73GCH1H010B	CHIP C	1.0PF B
R325			RK73GB2A000J	CHIP R 0.0 J 1/10W		C366,367			CK73HB1H471K	CHIP C	470PF K
R327			RK73GB2A000J	CHIP R 0.0 J 1/10W		C368			CC73GCH1H060B	CHIP C	6.0PF B
R331			RK73GB2A000J	CHIP R 0.0 J 1/10W		C369-373			CC73GCH1H050B	CHIP C	5.0PF B
R333			RK73HB1J000J	CHIP R 0.0 J 1/16W		C374,375			CC73GCH1H0R5B	CHIP C	0.5PF B
R350,351			RK73HB1J474J	CHIP R 470K J 1/16W		C376,377			CK73HB1H471K	CHIP C	470PF K
R352			RK73HB1J000J	CHIP R 0.0 J 1/16W		C378			CC73HCH1H040C	CHIP C	4.0PF C
R354			RK73HB1J474J	CHIP R 470K J 1/16W		C379			C93-0787-05	CHIP C	0.1UF J
R357,358			RK73HB1J000J	CHIP R 0.0 J 1/16W		C382			CC73GCH1H050B	CHIP C	5.0PF B
R361,362			RN73GH1J330D	CHIP R 33 D 1/16W		C383			CC73GCH1H030B	CHIP C	3.0PF B
R363,364			RN73GH1J271D	CHIP R 270 D 1/16W		CN303			E40-5816-05	PIN ASSY	
R365,366			RN73GH1J470D	CHIP R 47 D 1/16W		CN350			E40-6860-05	PIN ASSY	
R367			RK73HB1J330J	CHIP R 33 J 1/16W		CN351			E40-6098-05	PIN ASSY	
R368			RN73GH1J333D	CHIP R 33K D 1/16W		-			F10-2377-04	SHIELDING CASE	
R369			RN73GH1J103D	CHIP R 10K D 1/16W		L300			L92-0163-05	BEADS CORE	
R370			RK73HB1J101J	CHIP R 100 J 1/16W		L303			L41-1295-33	SMALL FIXED INDUCTOR (1.2UH)	
R372			RK73HB1J000J	CHIP R 0.0 J 1/16W		L305,306			L92-0163-05	BEADS CORE	
R374			RK73GB2A000J	CHIP R 0.0 J 1/10W		L307			L41-1078-14	SMALL FIXED INDUCTOR (10NH)	
R377			RK73GB2A000J	CHIP R 0.0 J 1/10W		L309			L41-4778-14	SMALL FIXED INDUCTOR (47NH)	
R379			RK73HB1J000J	CHIP R 0.0 J 1/16W		L310			L92-0163-05	BEADS CORE	
D352,353			1SV325F	VARIABLE CAPACITANCE DIODE							
D355			1SV282-F	VARIABLE CAPACITANCE DIODE							
D357-361			1SV282-F	VARIABLE CAPACITANCE DIODE							

## PARTS LIST / 零件表

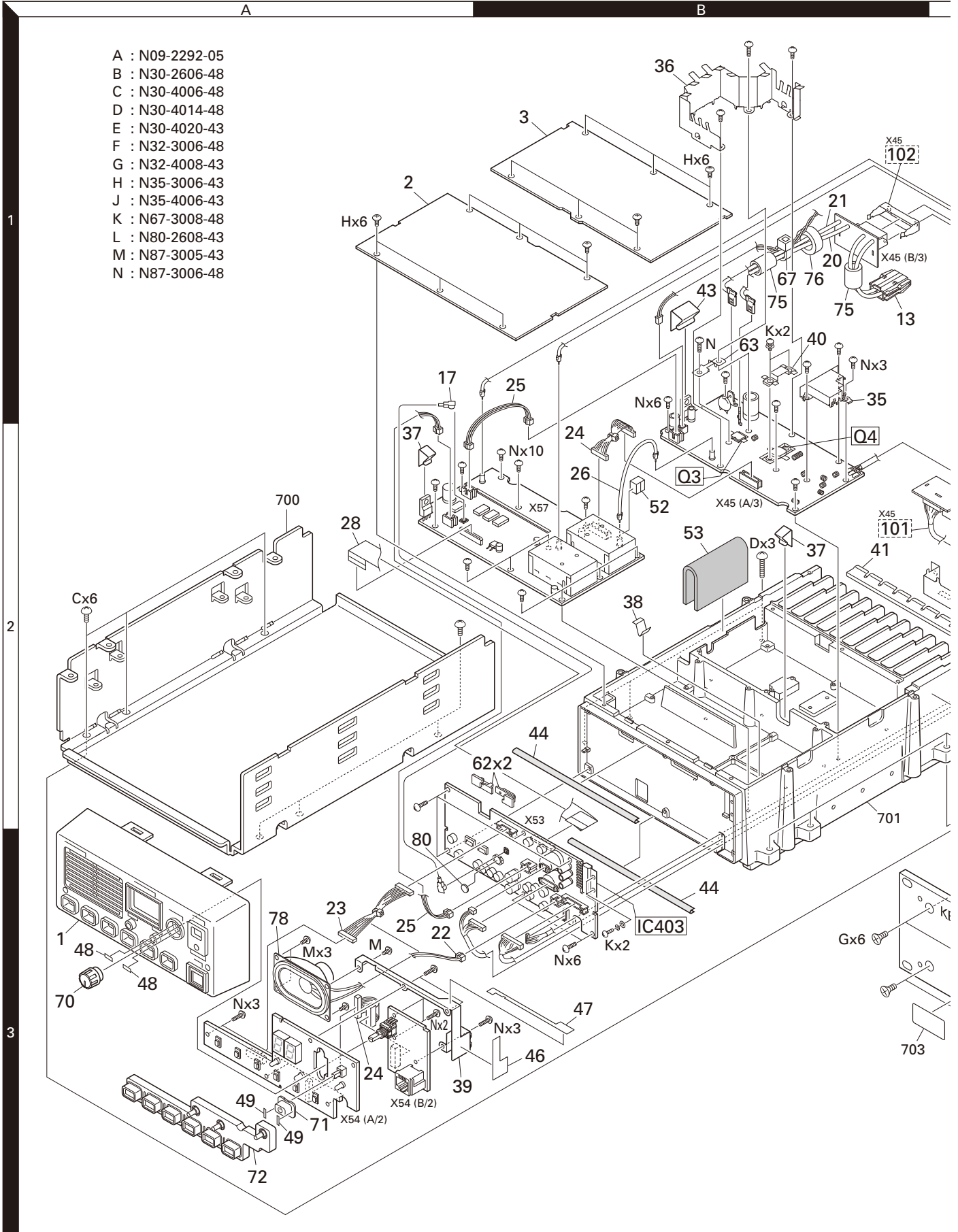
TX VCO/PLL UNIT (X58-5100-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
L312,313			L92-0163-05	BEADS CORE		Q350,351			SSM6L05FU-F	FET	
L314			L41-1078-14	SMALL FIXED INDUCTOR (10NH)		Q352,353			MCH3914(8)-H	FET	
L315			L41-3978-14	SMALL FIXED INDUCTOR (39NH)		Q354			2SC5636	TRANSISTOR	
L350-357			L41-1095-33	SMALL FIXED INDUCTOR (1.0UH)							
L358			L34-4608-15	AIR-CORE COIL							
L359			L34-4607-15	AIR-CORE COIL							
L360,361			L41-1005-33	SMALL FIXED INDUCTOR (10UH)							
L362,363			L41-1095-33	SMALL FIXED INDUCTOR (1.0UH)							
L364			L41-1875-33	SMALL FIXED INDUCTOR (0.018UH)							
L365,366			L92-0163-05	BEADS CORE							
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							
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			RK73HB1J391J	CHIP R 390 J 1/16W							
R320			RK73HB1J103J	CHIP R 10K J 1/16W							
R321			RK73HB1J562J	CHIP R 5.6K J 1/16W							
R322			RK73HB1J220J	CHIP R 22 J 1/16W							
R323			RK73HB1J470J	CHIP R 47 J 1/16W							
R324			RK73HB1J220J	CHIP R 22 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			RK73HB1J180J	CHIP R 18 J 1/16W							
R357,358			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			RN73GH1J333D	CHIP R 33K D 1/16W							
R369			RN73GH1J103D	CHIP R 10K D 1/16W							
R370			RK73HB1J820J	CHIP R 82 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			1SV278F	VARIABLE CAPACITANCE DIODE							
D355			1SV282-F	VARIABLE CAPACITANCE DIODE							
D357			1SV282-F	VARIABLE CAPACITANCE DIODE							
D358-361			1SV278F	VARIABLE CAPACITANCE DIODE							
IC300			SKY72300-362	MOS-IC							
Q300			2SC5636	TRANSISTOR							

# NXR-810

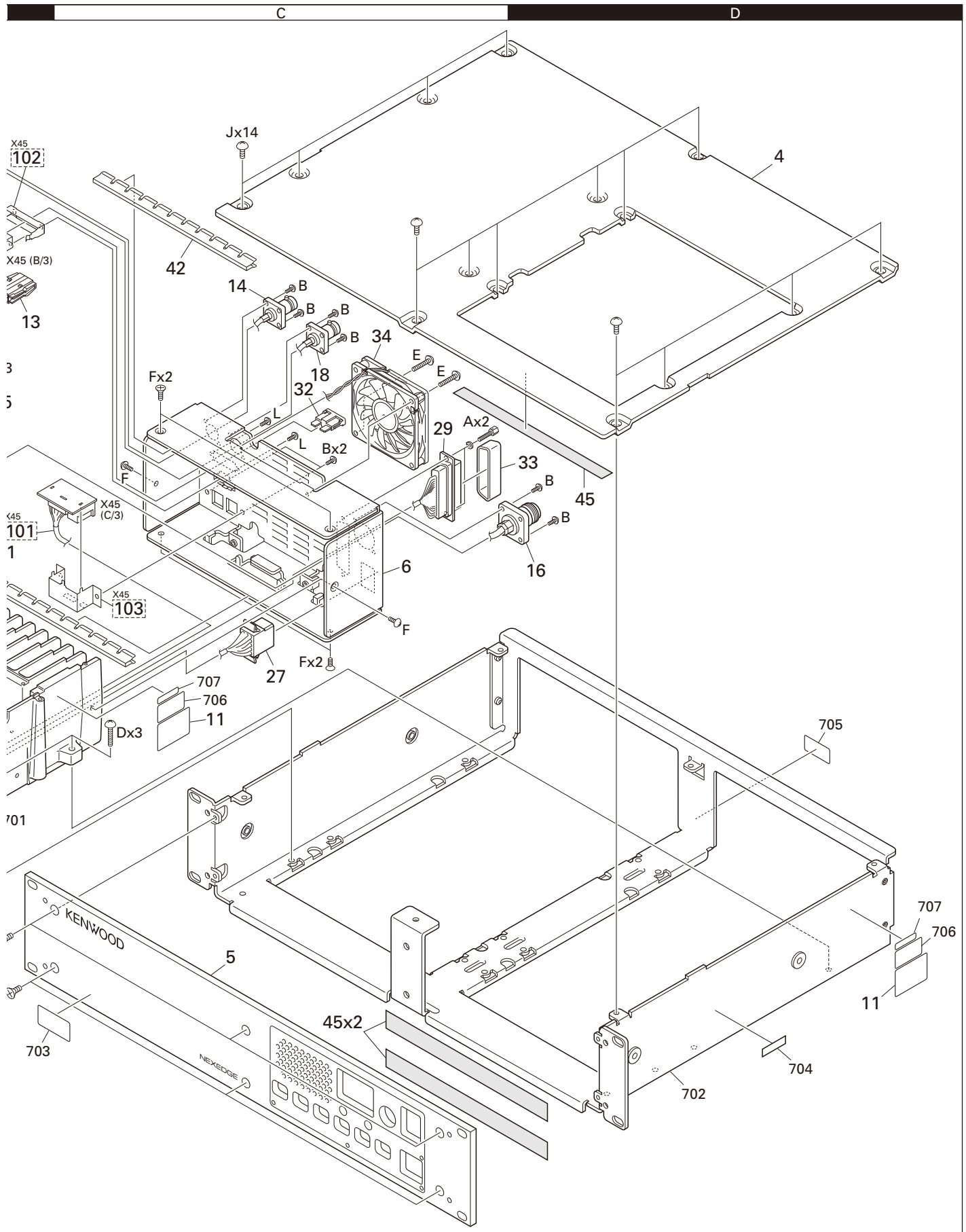
## EXPLODED VIEW / 部件分解图

- A : N09-2292-05
- B : N30-2606-48
- C : N30-4006-48
- D : N30-4014-48
- E : N30-4020-43
- F : N32-3006-48
- G : N32-4008-43
- H : N35-3006-43
- J : N35-4006-43
- K : N67-3008-48
- L : N80-2608-43
- M : N87-3005-43
- N : N87-3006-48



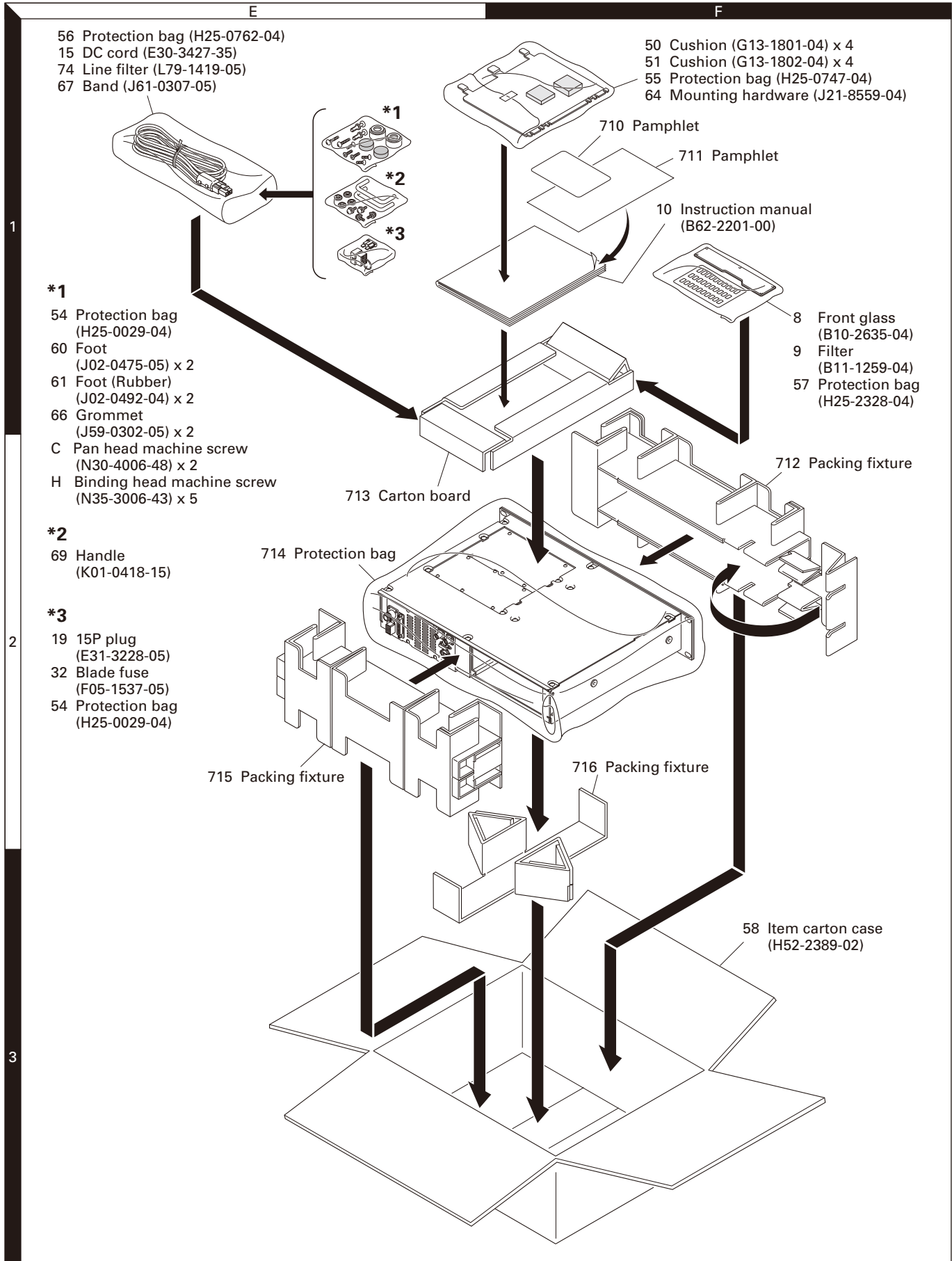
52 Parts with the exploded numbers larger than 700 are not supplied.  
 If a part reference number is listed in a box on the exploded view of the PCB, that part does not come with the PCB.  
 These parts must be ordered separately.

## EXPLODED VIEW / 部件分解图



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

## PACKING / 包装



## TROUBLE SHOOTING

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

#### ■ Overview

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

#### ■ BGA parts

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

#### ● Checking power supply voltage

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

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

When an abnormal value is confirmed.

Checking for an abnormal point

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

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

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

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

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

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

#### ● Checking the clock

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

When an abnormal value is confirmed.

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

#### ● Checking the Reset/Control signal

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

When an abnormal value is confirmed.

The BGA parts are not broken.

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

When an abnormal value is confirmed.

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

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

When an abnormal value is confirmed.

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

When a normal value is confirmed.

### 1. BGA (球状矩阵排列) IC 的故障诊断

#### ■ 概述

用于确定中继台因 BGA 部分损坏时是否可以开启电源 (即使打开电源开关显示屏也不工作) 的流程。

#### ■ BGA 部分

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

#### ● 检查电源电压

检查电压	
检查点	正常电压
33M IC303 (5针)	3.3V
16M IC305 (5针)	1.6V
15M IC304 (5针)	1.5V
33A IC306 (5针)	3.3V
33BU Q303 (集电极侧)	3.3V
各装置的电源连通线圈。 [ASIC] 33M: L20和L308, 15M: L309 [DSP] 33M: L4和L308, 16M: R324 [SRAM] 33BU: L5	

确认数值异常时

检查异常点	
33M有异常电压 [ASIC] 取出L20检查33M的电压。 如果电压变正常, 则ASIC已损坏。 [DSP] 取出L4检查33M的电压。 如果电压变正常, 则DSP已损坏。	
16M有异常电压 [DSP] 取出R324检查16M的电压。 如果电压变正常, 则DSP已损坏。	
15M有异常电压 [ASIC] 取出L309检查15M的电压。 如果电压变正常, 则ASIC已损坏。	
33A有异常电压 [ASIC] 取出L316检查33A的电压。 如果电压变正常, 则ASIC已损坏。	
33BU有异常电压 [SRAM] 取出L5检查33BU的电压。 如果电压变正常, 则SRAM已损坏。	
如果电压无法纠正, 则是BGA部分之外的其他部分的问题。	

确认数值正常时

#### ● 检查时钟

检查频率和幅值电压	
检查点	正常频率和幅值
18.432MHz R115 (ASIC侧)	18.432MHz 3.3V
R52 (DSP侧)	18.432MHz 3.3V
32.768kHz IC17 (1针)	32.768kHz 3.3V

确认数值异常时

[18.432MHz] 取下R115和R52。 如果它正常振荡, 则DSP和ASIC可能已损坏。 [32.768kHz] 更换IC17 (RTC)。 如果它正常振荡, 则ASIC可能已损坏。
--

确认数值正常时

#### ● 检查复位/控制信号

检查输入到ASIC的复位和控制信号	
检查点	正常电压
RESET R511	3.3V
/BINT IC307 (1针)	3.3V
/OVRB Q301 (集电极侧)	3.3V

确认数值异常时

BGA部分未损坏。
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确认数值正常时

检查ASIC输入开关信号 *各信号未被FPU的设置屏蔽。 按住POWER键	
检查点	确认的电压
/PSW R271 (ASIC侧)	0V

确认数值异常时

#### ● 检查ASIC的输出信号

检查点	正常电压
/FRST IC3 (12针)	3.3V

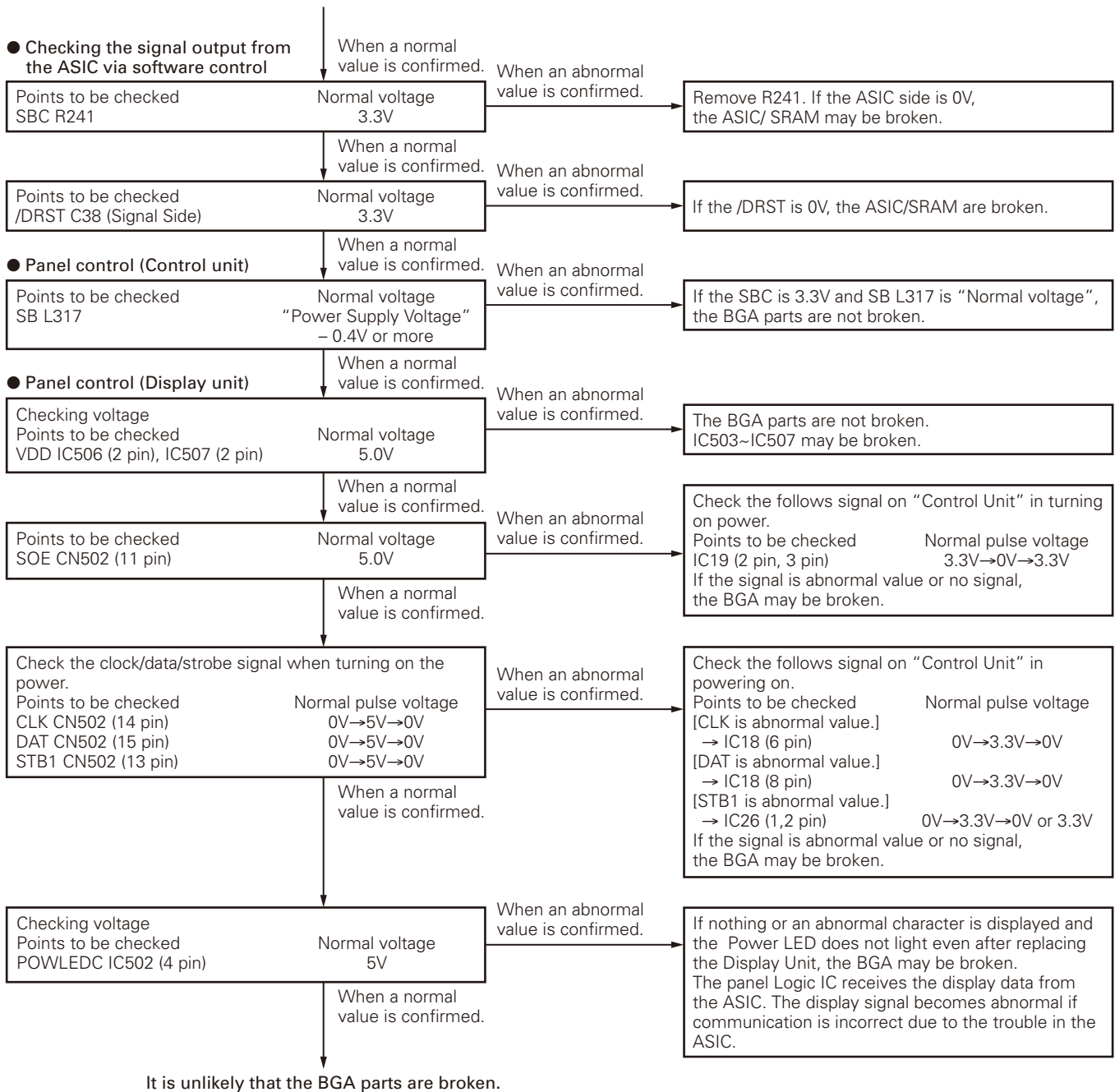
确认数值异常时

如果 /FRST始终为0V, 则ASIC已损坏。
--------------------------

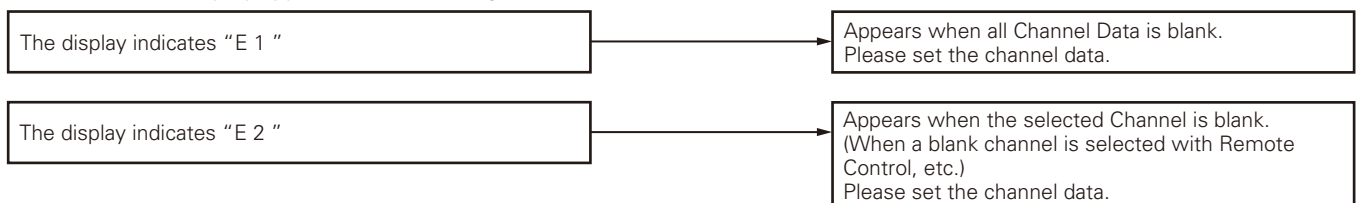
确认数值正常时



## TROUBLE SHOOTING



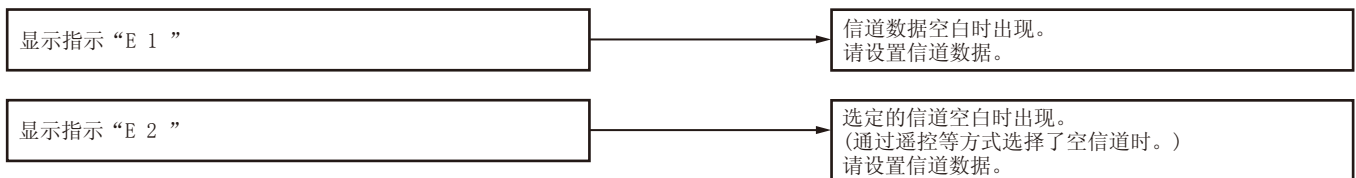
● **When an error display appears on the LED segment indicator.**



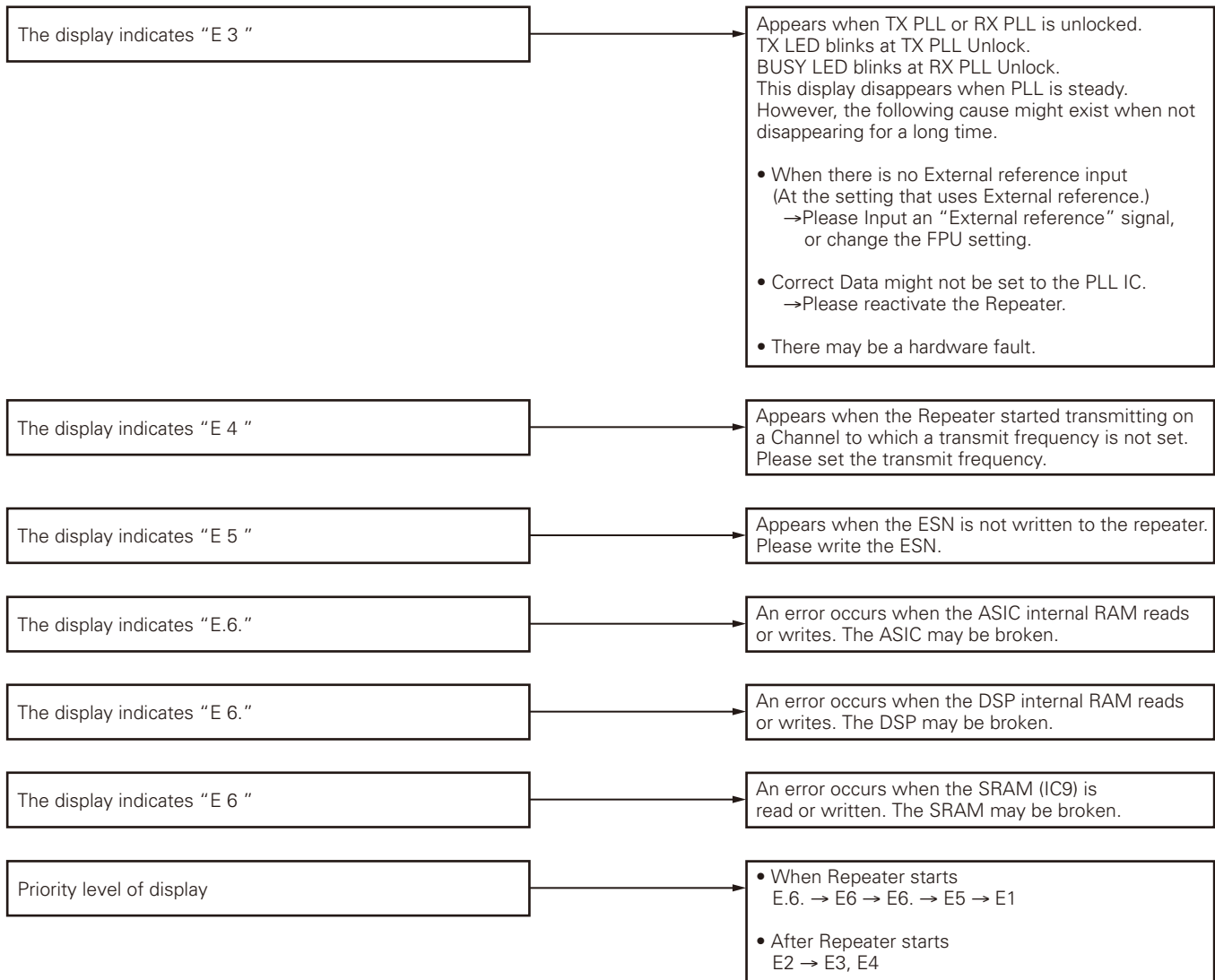
## 故障排除



● LED段指示上出现错误显示时。



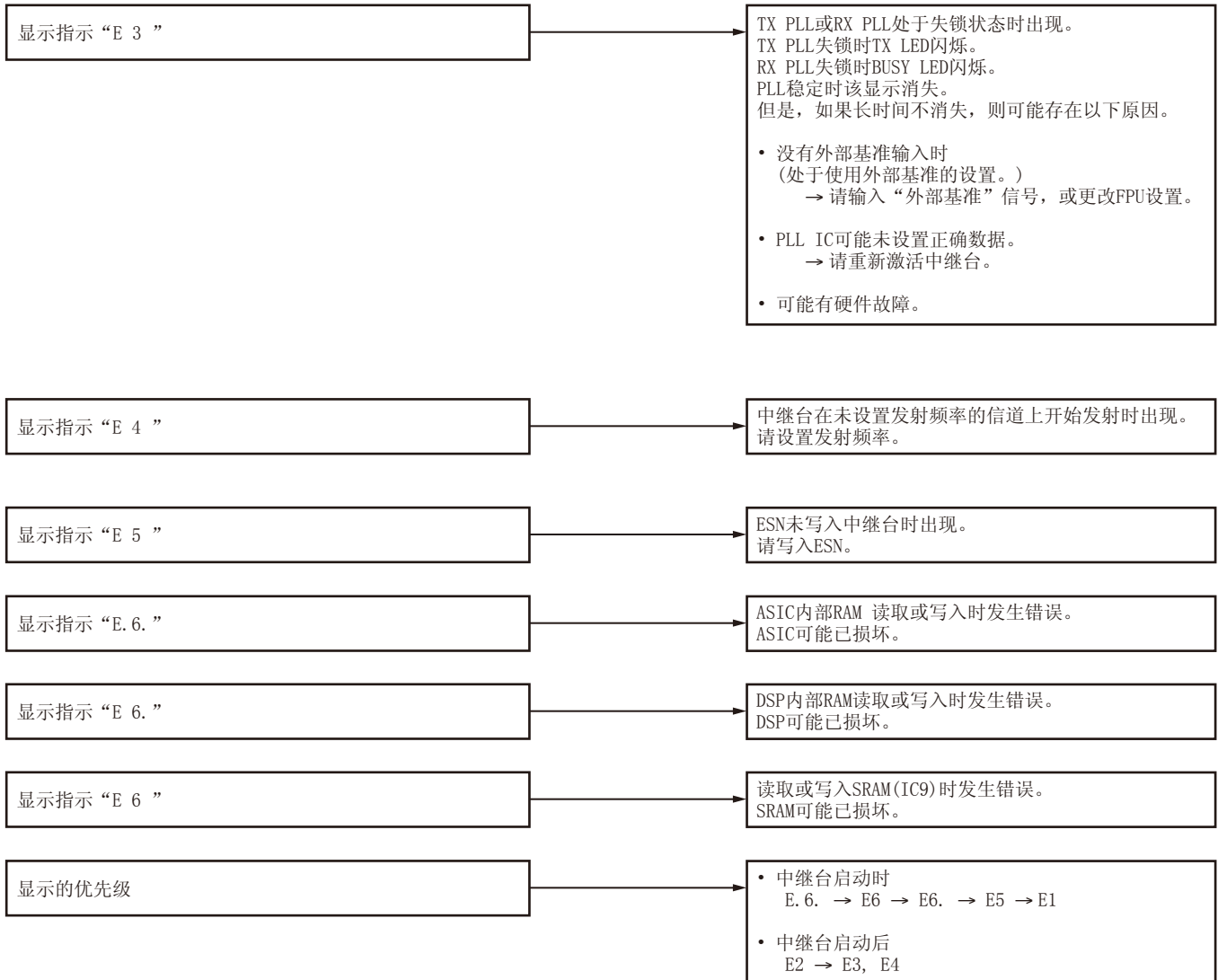
## TROUBLE SHOOTING



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

1. Switch off the repeater.  
The impedance of the Final FET (Q4) and Drive FET (Q3) can be measured easily using a DVM (Digital Volt Meter) ohm mode.  
Normal condition – Gate: > 5kohm  
The above impedance values are rough estimations.
2. Switch on the repeater. Check the voltage at F1 output point.  
The voltage is around 13.6V during reception.  
The voltage will be 13.0V~ during transmission.  
If this point measures 0V, then F1 is damaged.
3. Remove C27.
4. Connect a 50ohm load to the ANT terminal.  
Transmit and check the current drain in High power mode.  
If the current drain is less than 1.0A, then the Final FET is damaged.  
If the current drain is less than 5.0A, short the Drive FET gate to ground, and check the current drain.  
If the current drain is not 0.1A less than the original value, then the Drive FET is damaged.
5. Check the input power level at the Drive FET gate location.  
Connect the wire to [RF] location. (A join of R17 and R18)  
Confirm that it is about 0.3W.  
If power found is considerably lower than 0.3W, check the circuit before the Drive FET.

## 故障排除



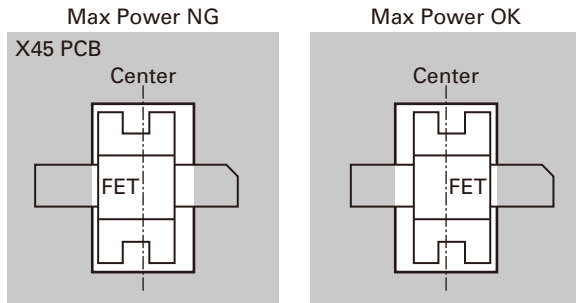
### 2. 如果未获得正常功率，请执行以下步骤

1. 关闭中继台。  
利用 DVM( 数字电压表 ) ohm 模式，可轻松测量末级 FET (Q4) 和驱动 FET (Q3) 的阻抗。  
正常状态 - 栅 : >5kohm  
上述阻抗值是粗略估计值。
2. 开启中继台。检查 F1 输出点的电压。  
接收期间电压约为 13.6V。  
发射期间电压将为 13.0V ~。  
如果该点测得 0V，则表示 F1 已损坏。
3. 取下 C27。
4. 将 50ohm 负载连接到 ANT 端子。  
发射并检查高功率模式下的电流消耗。  
如果电流消耗小于 1.0A，则末级 FET 已损坏。  
如果电流消耗小于 5.0A，请将驱动 FET 栅短接到接地，然后检查电流消耗。  
如果电流消耗不低于原值 0.1A，则表示驱动 FET 已损坏。
5. 检查驱动 FET 栅位置的输入功率电平。  
将导线连接到 [RF] 位置。(R17 和 R18 结合处)  
确认它约为 0.3W。  
如果发现功率明显低于 0.3W，请检查驱动 FET 之前的电路。

## TROUBLE SHOOTING / 故障排除

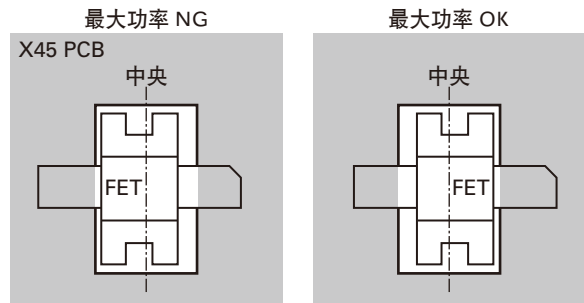
### ■ Replacing the Final FET (Q4)

- 1) The X45 (final) PCB must be shifted to the left after placing it into the chassis.  
Insert a board of just 1mm between the PCB and the case.
- 2) The FET (RD60HUF1-101) must be shifted to the right during mounting.



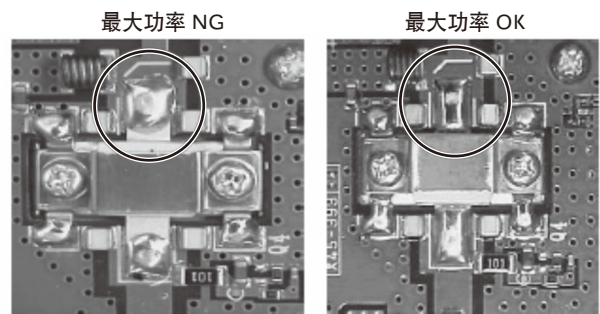
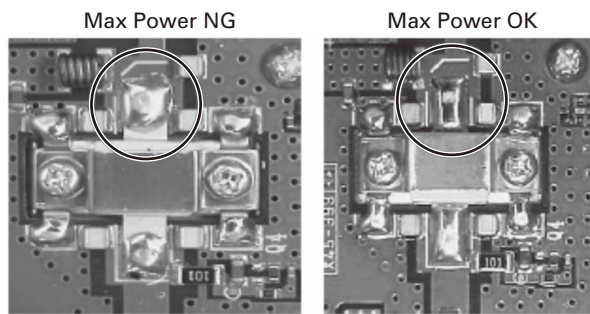
### ■ 更换末级 FET(Q4)

- 1) 将 X45 (末级) PCB 安置到底座之前, 必须将其转移到左侧。  
在 PCB 与壳体之间插入一块仅 1mm 的板。
- 2) 安装期间必须将 FET (RD60HUF1-101) 转移到右侧。



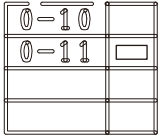
- 3) Apply solder to cover the entire FET terminal. (Both input and output terminals of the FET (Q3,Q4)).

- 3) 涂上焊料以覆盖整个 FET 端子。(FET (Q3, Q4) 的输入和输出端子)。



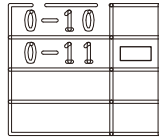
## 3. Replacing Control Unit

### 3-1. Control Unit Information

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

## 3. 更换控制单元

### 3-1. 控制单元信息

原始控制单元	控制单元 (维修单元)	原始单元与维修单元之间的差别
X53-4490-10	X53-4490-11	维修单元的 0-11 位置装有芯片。 

### 3-2. Supplied Accessories

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

### 3-2. 附件

项目 (包括零件号)	数量
控制单元 (X53-449)	1
Kenwood ESN 标签	3
NXDN ESN 标签	2
附加物 (B59-2621-XX)	1

### 3-3. Printed Circuit Board Data

The following data is written on the printed circuit board:

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

### 3-4. After Changing the PCB

1. After changing the printed circuit board, write the up-to-date Firmware following the instructions in the "REALIGNMENT 4. Firmware Programming Mode".
2. Using the KPG-129D(C), select your desired item (Model Name and Frequency) from the Model > Product Information menu, then use Program > Write Data to the Repeater to write the FPU data (PC Programming mode).  
When writing to the repeater, a Warning Message, corresponding to the item selected, appears. Click [OK] to continue writing the data.
3. Enter Program > Test mode, then adjust the various adjustment data (PC Test mode) as described in the "ADJUSTMENT".
4. For the X53-449, attach the new labels corresponding to the new printed circuit board. (Refer to the images on page 63 for label placement.)
5. If necessary, write the FPU data used by the customer with the KPG-129D(C).

#### Note:

- When a new printed circuit board is used, the Kenwood ESN changes, as does the Repeater Information display of the KPG-129D(C), but this does not have any effect on the operation of the transceiver.
- If changing to the original Kenwood ESN and NXDN ESN, please contact our service center.
- Re-installing other parts from original unit to Service unit is not required after changing to Service unit.

### 3-3. 印刷电路板数据

印刷电路板上写有以下数据：

数据类型	说明
固件	NXR-710/810 固件
FPU 数据 (PC 编程模式)	NXR-710 K 型数据
各种调整数据 (PC 测试模式)	NXR-710 的一般调整值
Kenwood ESN	型号名称：NXR-710/810S 型式：K 写有与 Kenwood ESN 标签相同的编号。
NXDN ESN	写有与 NXDN ESN 标签相同的编号。

### 3-4. 更换 PCB 后

1. 更换印刷电路板后，按照“模式组合 4. 固件编程模式”的说明写入最新的固件。
2. 使用 KPG-129D(C)，从 Model(机型) > Product Information(产品信息) 菜单中选择所需的项目(型号名称和频率)，然后用 Program(编程) > Write Data to the Repeater(向中继台写入数据) 写入 FPU 数据(PC 编程模式)。  
写入中继台时，会出现与所选项目对应的警告讯息。单击 [OK] 继续写入数据。
3. 进入 Program(编程) > Test mode(测试模式)，然后按照“调整”中的说明调整各项调整数据(PC 测试模式)。
4. 对于 X53-449，贴上与新印刷电路板对应的新标签。(关于标签位置，请参阅第 63 页的图像。)
5. 如有必要，使用 KPG-129D(C) 写入用户使用的 FPU 数据。

#### 注意：

- 使用新印刷电路板时，Kenwood ESN 会改变，KPG-129D(C) 的中继台信息显示也会改变，但这并不影响中继台的操作。
- 若要改为原来的 Kenwood ESN 和 NXDN ESN，请与我方的维修中心联系。
- 换为维修单元之后，不需要将原始单元的其他部件重新安装到维修单元。

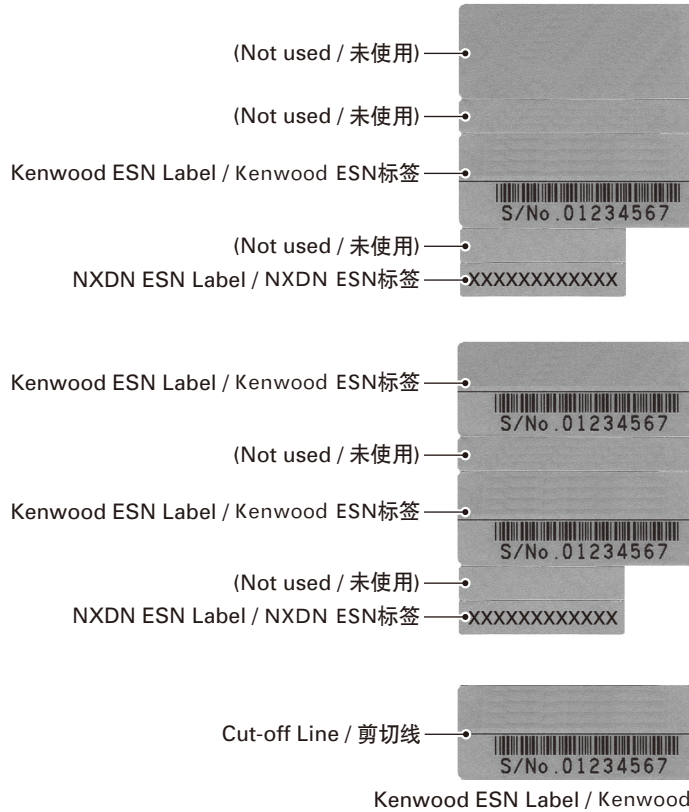
## TROUBLE SHOOTING / 故障排除

### 3-5. ESN Label Layout

The following labels are provided in the service unit package.

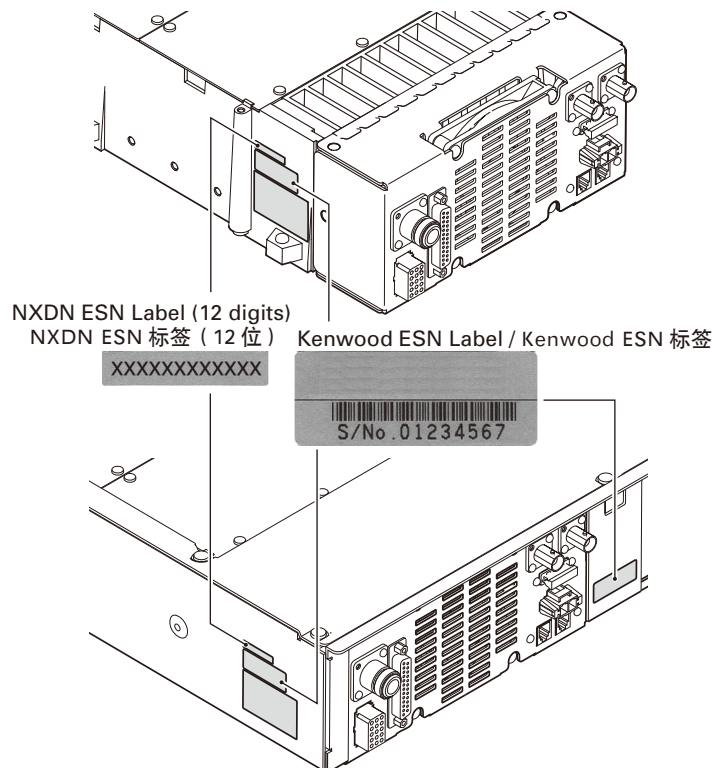
### 3-5. ESN 标签布局

维修单元的包装上提供了以下标签。



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

**注意:** 对于 X53-449, Kenwood ESN 标签上未印制 UPC 代码和 UPC 条码。如有必要, 可在剪切线处切断标签, 仅贴上序列号。

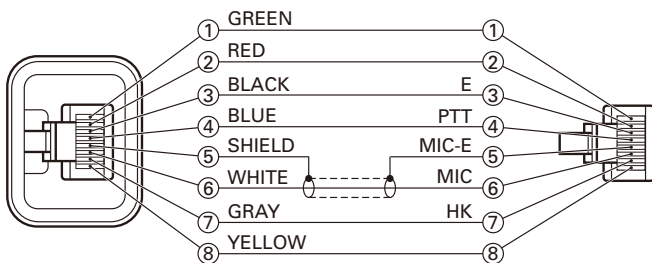


## ADJUSTMENT

### Test Equipment Required for Alignment

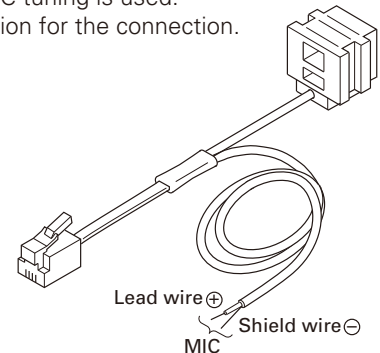
Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range Modulation Output When performing the Frequency adjustment, the following accuracy is necessary. • 0.001ppm Use a standard oscillator for adjustments, if necessary.	400 to 470MHz Frequency modulation and external modulation -127dBm/0.1μV to greater than -20dBm/22.4mV
2. Power Meter	Input Impedance Operation Frequency Measurement Capability	50Ω 400 to 470MHz or more Vicinity of 100W
3. Deviation Meter	Frequency Range	400 to 470MHz
4. Digital Volt Meter (DVM)	Measuring Range Input Impedance	1V to 20V DC High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range Frequency Stability	10Hz to 600MHz 0.2ppm or less
7. Ammeter		15A or more
8. AF Volt Meter (AF VTVM)	Frequency Range Voltage Range	50Hz to 10kHz 3mV to 3V
9. Audio Generator (AG)	Frequency Range Output	50Hz to 5kHz 0 to 1V
10. Distortion Meter	Capability Input Level	3% or less at 1kHz 50mV to 10Vrms
11. Voltmeter	Measuring Range Input Impedance	10V to 1.5V DC or less 50kΩ/V or greater
12. 4Ω Dummy Load		Approx. 4Ω, 5W

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

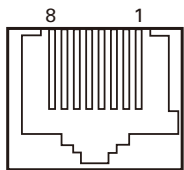


### Tuning cable (E30-3383-05)

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



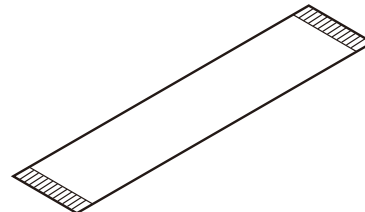
### MIC connector (Front panel view)



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

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

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



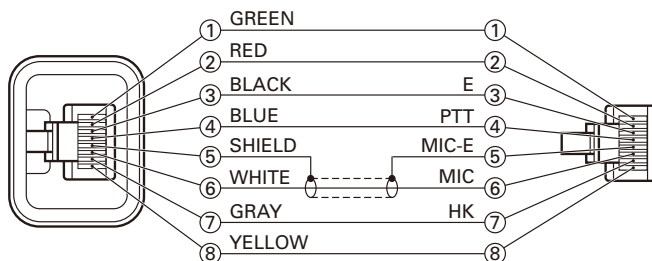


## 调 整

### 调整所需的测试设备

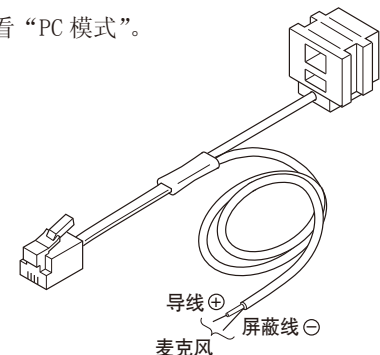
测试设备	主要规格
1. 标准信号发生器 (SSG)	频率范围 400 到 470MHz 调制 调频和外部调制 输出 $-127\text{dBm}/0.1\mu\text{V}$ 到大于 $-20\text{dBm}/22.4\text{mV}$ 进行频率调整时, 需要以下精度。 • 0.001ppm 如有必要, 请使用标准振荡器进行调整。
2. 功率计	输入阻抗 $50\Omega$ 操作频率 400 到 470MHz 测量范围 100W 左右
3. 频偏仪	频率范围 400 到 470MHz
4. 数字电压表 (DVM)	测量范围 直流 1V 到 20V 输入阻抗 为最小电路负载高输入阻抗
5. 示波器	直流到 30MHz
6. 高灵敏度频率计数器	频率范围 10Hz 到 600MHz 频率稳定性 0.2ppm 或更低
7. 电流表	15A 或更高
8. 音频电压表 (AF VTVM)	频率范围 50Hz 到 10kHz 电压范围 3mV 到 3V
9. 音频发生器 (AG)	频率范围 50Hz 到 5kHz 输出 0V 到 1V
10. 失真测试仪	能力 在 1kHz 时 3% 或更低 输入电平 50mV 到 10Vrms
11. 电压表	测量范围 直流 10V 到 1.5V 或更低 输入阻抗 $50\text{k}\Omega/\text{V}$ 或更高
12. $4\Omega$ 假负载	大约 $4\Omega$ , 5W 或更高

### 用于麦克风输入的测试电缆 (E30-3360-28)

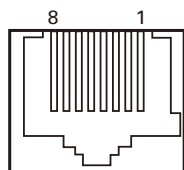


### 调谐电缆 (E30-3383-05)

如果使用 PC 调谐, 则输入音频需要适配器电缆 (E30-3383-05)。有关连接详情, 请参看“PC 模式”。



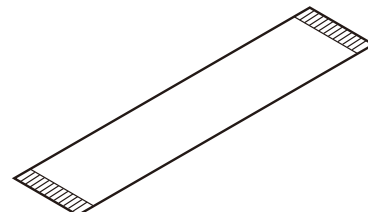
### MIC 连接器 (前面板视图)



- 1: NC
- 2: SB
- 3: GND
- 4: PTT/TXD  
(来自中继台的 PC 串行数据)
- 5: MIC GND
- 6: MIC
- 7: HOOK/RXD  
(送到中继台的 PC 串行数据)
- 8: NC

### 带状电缆 (36 针), 约 256mm

要在使用中将控制单元 (CN38) 连接到 TX-RX 单元 (CN800), 可以使用 KENWOOD 零部件中心提供的 36 针带状电缆 E37-0979-05。



## ADJUSTMENT

### Test Channel

No.	RX	TX
1	435.050000MHz	435.100000MHz
2	400.050000MHz	400.100000MHz
3	469.950000MHz	469.900000MHz
4	435.000000MHz	435.000000MHz
5	435.200000MHz	435.200000MHz
6	435.400000MHz	435.400000MHz
7~16	-	-

### Test Signaling (Analog)

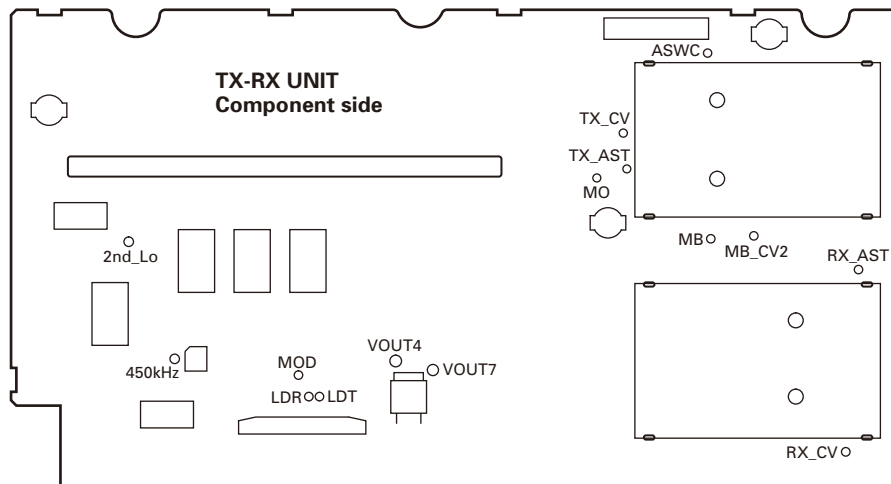
No.	RX (Decode Signaling)	TX (Encode Signaling)
1	None	None
2	None	100Hz Square Wave
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 210.7Hz	QT 210.7Hz
6	QT 254.1Hz	QT 254.1Hz
7	DQT D023N	DQT D023N
8	DQT D754I	DQT D754I
9	DTMF Decode (CODE: 159D)	DTMF Encode (CODE: 159D)
10	None	DTMF Encode (CODE: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

### Test Signaling (NXDN)

No.	RX (Decode Signaling)	TX (Encode Signaling)
1	RAN1	RAN1
2	RAN1	PN9
3	RAN1	Maximum Deviation Pattern

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

### Adjustment Points



## 调整

### 测试信道

编号	接收	发射
1	435.050000MHz	435.100000MHz
2	400.050000MHz	400.100000MHz
3	469.950000MHz	469.900000MHz
4	435.000000MHz	435.000000MHz
5	435.200000MHz	435.200000MHz
6	435.400000MHz	435.400000MHz
7~16	-	-

### 测试信令 (模拟)

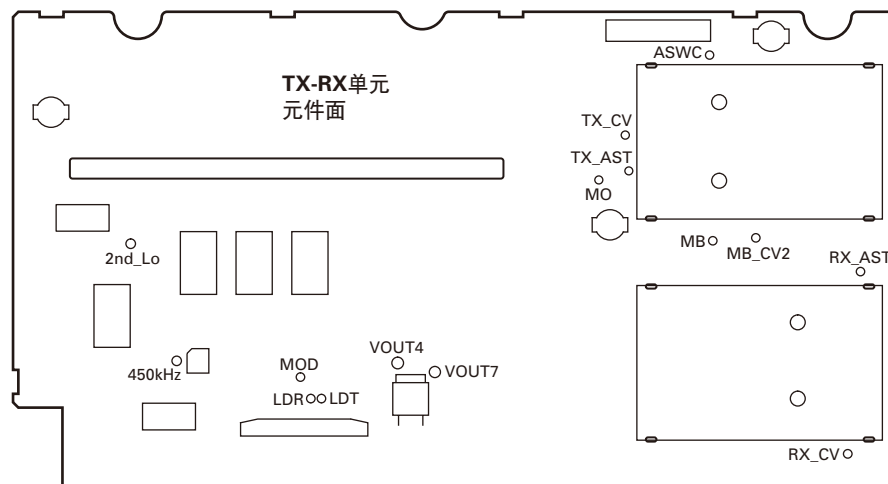
编号	接收 (解码信令)	发射 (编码信令)
1	无	无
2	无	100Hz 方波
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 210.7Hz	QT 210.7Hz
6	QT 254.1Hz	QT 254.1Hz
7	DQT D023N	DQT D023N
8	DQT D754I	DQT D754I
9	DTMF 解码 (码 :159D)	DTMF 编码 (码 :159D)
10	无	DTMF 编码 (码 :9)
11	无	测试音编码
12	无	CW ID 编码 (ID: VVV)
13	无	礼貌音

### 测试信令 (NXDN)

编号	接收 (解码信令)	发射 (编码信令)
1	RAN1	RAN1
2	RAN1	PN9
3	RAN1	最大频偏模式

- 信令编号 1 用于链接测试。
- 信令编号 2 用于 TX 调制信号质量测试, 即 TX 临近信道功率、FSK 误差、占用带宽、辐射屏蔽等。
- 信令编号 3 用于 TX 频偏测试。如果调制模式为超窄, 则调制频率为 600Hz。如果调制模式为窄, 则调制频率为 1200Hz。

### 调整点



## 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). 2) Turn the power switch on after connecting a PC and FPU cable to the radio. 3) Start up the program for the adjustment.							
2. Receive Assist Adjust	FPU Test mode 1) Adjust Item: [Receive Assist] 2) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High]					PC ADJ	3.0V	±0.1V  [V] indicator on the PC window shows "VCO lock voltage". Change the adjustment value to get "VCO lock voltage" within the limit of the specified voltage.  Press [Apply All] button to store the adjustment value.  Confirm the VCO lock voltage approximately 3 seconds after the adjustment value is changed.
	3) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High]	DVM	TX-RX	RX_CV			Check	3.0V±0.1V
3. Transmit Assist Adjust	FPU Test mode 1) Adjust Item: [Transmit Assist] 2) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High] Press [Transmit] button.					PC ADJ	3.0V	±0.1V  [V] indicator on the PC window shows "VCO lock voltage". Change the adjustment value to get "VCO lock voltage" within the limit of the specified voltage.  Press [Apply All] button to store the adjustment value.  Confirm the VCO lock voltage approximately 3 seconds after the adjustment value is changed.
	3) Adjust Item: [A: Low], [A: Center], [A: High], [B: Low], [B: Center], [B: High] Press [Transmit] button.	DVM	TX-RX	TX_CV			Check	3.0V±0.1V
4. Sensitivity 1 Adjust	FPU Test mode 1) Adjust Item: [Sensitivity 1] 2) Adjust Item: [Low], [Low'], [Center], [High'], [High]					PC ADJ	Write the value as followings (typical value). [Low] = 25 [Low'] = 70 [Center] = 103 [High'] = 145 [High] = 213	Press [Apply All] button to store the adjustment value.  Variable-Capacitor Tune voltage is adjusted. (Output voltage is adjustment of BPF)

## 调 整

## 共通部分

项 目	条 件	测 量			调 整			规 格 / 备 注
		测量装置	单元	端子	单元	部件	方 法	
1. 设置	1) 将装置连接到适当的电源 (13.6V)。 2) 将 PC 和 FPU 电缆连接到无线电设备后，打开电源开关。 3) 启动调整程序。							
2. 接收辅助调整	FPU 测试模式 1) 调整项目:[接收辅助] 2) 调整项目:[A:低],[A:中],[A:高],[B:低],[B:中],[B:高]					PC 调整	3.0V	±0.1V  PC 窗口上的 [V] 指示显示“VCO 锁定电压”。更改调整值，以获得指定电压范围内的“VCO 锁定电压”。  按 [全部应用] 按钮储存调整值。  在更改调整值约 3 秒后确认 VCO 锁定电压。
	3) 调整项目:[A:低],[A:中],[A:高],[B:低],[B:中],[B:高]	DVM	TX-RX	RX_CV			检查	3.0V±0.1V
3. 发射辅助调整	FPU 测试模式 1) 调整项目:[发射辅助] 2) 调整项目:[A:低],[A:中],[A:高],[B:低],[B:中],[B:高] 按 [发射] 按钮。					PC 调整	3.0V	±0.1V  PC 窗口上的 [V] 指示显示“VCO 锁定电压”。更改调整值，以获得指定电压范围内的“VCO 锁定电压”。  按 [全部应用] 按钮储存调整值。  在更改调整值约 3 秒后确认 VCO 锁定电压。
	3) 调整项目:[A:低],[A:中],[A:高],[B:低],[B:中],[B:高] 按 [发射] 按钮。	DVM	TX-RX	TX_CV			检查	3.0V±0.1V
4. 灵敏度 1 调整	FPU 测试模式 1) 调整项目:[灵敏度 1] 2) 调整项目:[低],[低'],[中],[高],[高']					PC 调整	写入以下值 (典型值)。 [低]=25 [低']=70 [中]=103 [高']=145 [高]=213	按 [全部应用] 按钮储存调整值。  调整可变电容器调谐电压。(输出电压为 BPF 的调整)

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Sensitivity 2 Adjust	FPU Test mode 1) Adjust Item: [Sensitivity 2] 2) Adjust Item: [Low], [Low'], [Center], [High'], [High]					PC ADJ	Write the value as followings (typical value) [Low] = 25 [Low'] = 70 [Center] = 103 [High'] = 145 [High] = 213	Press [Apply All] button to store the adjustment value.  Variable-Capacitor Tune voltage is adjusted. (Output voltage is adjustment of BPF)
6. AGC Target Level Adjustment	FPU Test mode 1) Adjust Item: [AGC Target Level Adjustment]						Write the value as followings (typical value) [AGC Target Level Adjustment] = -18	Press [Apply] button to store the adjustment value.
7. AGC Adjustment [Analog Narrow]	FPU Test mode 1) Adjust Item: [AGC Adjustment (Analog Narrow)] 2) Adjust Item: [Low], [Low'], [Center], [High'], [High]						Write the value as followings (typical value) [Low] = 256 [Low'] = 256 [Center] = 256 [High'] = 256 [High] = 256	Press [Apply All] button to store the adjustment value.
8. AGC Adjustment [Analog Wide]	FPU Test mode 1) Adjust Item: [AGC Adjustment (Analog Wide)] 2) Adjust Item: [Low], [Low'], [Center], [High'], [High]							
9. AGC Adjustment [NXDN Very Narrow]	FPU Test mode 1) Adjust Item: [AGC Adjustment (NXDN Very Narrow)] 2) Adjust Item: [Low], [Low'], [Center], [High'], [High]							
10. Frequency Adjust	FPU Test mode 1) Adjust Item: [Frequency] Connect the SSG to the RX ANT. CH: 1 (Analog Narrow) SSG Output: -47dBm (1mV) (CW (without modulation)) <b>Caution:</b> Perform the frequency adjustment under the following condition. <ul style="list-style-type: none"> <li>Temperature range of +23°C to +27°C (+73.4°F to +80.6°F). (The temperature is displayed on the frequency adjustment screen of the KPG-129D(C).)</li> <li>Use an accuracy of 0.001ppm for the SSG. (Use a standard oscillator if necessary.)</li> </ul>	SSG	Rear	RX ANT		PC ADJ		Press [Start] button of "Auto Tuning". Press [Apply] button to store the adjustment value after the automatic adjustment was finished.

## 调 整

项 目	条 件	测 量			调 整			规 格 / 备 注
		测量装置	单元	端子	单元	部件	方 法	
5. 灵敏度 2 调整	FPU 测试模式 1) 调整项目:[灵敏度 2] 2) 调整项目:[低],[低'], [中],[高],[高']					PC 调整	写入以下值(典型值)。 [低]=25 [低']=70 [中]=103 [高']=145 [高]=213	按[全部应用]按钮储存调整值。  调整可变电容器调谐电压。(输出电压为 BPF 的调整)
6. AGC 目标电平调整	FPU 测试模式 1) 调整项目:[AGC 目标电平调整]						写入以下值(典型值)。 [AGC 目标电平调整]=-18	按[应用]按钮储存调整值。
7. AGC 调整 [模拟窄带]	FPU 测试模式 1) 调整项目:[AGC 调整(模拟窄带)] 2) 调整项目:[低],[低'], [中],[高],[高']						写入以下值(典型值)。 [低]=256 [低']=256 [中]=256 [高']=256 [高]=256	按[全部应用]按钮储存调整值。
8. AGC 调整 [模拟宽带]	FPU 测试模式 1) 调整项目:[AGC 调整(模拟宽带)] 2) 调整项目:[低],[低'], [中],[高],[高']							
9. AGC 调整 [NXDN 甚窄带]	FPU 测试模式 1) 调整项目:[AGC 调整(NXDN 甚窄带)] 2) 调整项目:[低],[低'], [中],[高],[高']							
10. 频率调整	FPU 测试模式 1) 调整项目:[频率] 将 SSG 连接到 RX ANT。 CH:1(模拟窄带) SSG 输出:-47dBm(1mV) (CW(无调制)) <b>注意:</b> 在下述条件下进行频率调整。 • 温度范围 +23°C 到 +27°C。 (KPG-129D(C) 的频率调整画面上显示温度。) • 使用 0.001ppm 的 SSG 精度。 (如有必要,请使用标准振荡器。)	SSG	后面	RX ANT		PC 调整		按“自动调整”的[开始]按钮。 自动调整完成之后,按[应用]按钮储存调整值。

## ADJUSTMENT

### Receiver Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. RD Level Adjust [Analog Wide]	FPU Test mode 1) Adjust Item: [RD Level (Analog Wide)] Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501μV) MOD: 1.0kHz DEV: ±3.0kHz	SSG	Rear	RX ANT		PC ADJ	80mV	±5mV
		AF VTVM		CONTROL I/O Jack RD (Pin No.10)				Press [Apply] button to store the adjustment value.
2. RD Level Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [RD Level (Analog Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501μV) MOD: 1.0kHz DEV: ±1.5kHz							
3. RA Level Adjust [Analog Wide]	FPU Test mode 1) Adjust Item: [RA Level (Analog Wide)] Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501μV) MOD: 1.0kHz DEV: ±3.0kHz	SSG	Rear	RX ANT		PC ADJ	400mV	±20mV
		AF VTVM		CONTROL I/O Jack RA (Pin No.11)				Press [Apply] button to store the adjustment value.
4. RA Level Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [RA Level (Analog Narrow)] Connect the SSG to the RX ANT. SSG setting Frequency: Desired Frequency Output: -53dBm (501μV) MOD: 1.0kHz DEV: ±1.5kHz							
5. Open Squelch Adjust [Analog Wide]	FPU Test mode 1) Adjust Item: [Open Squelch (Analog Wide)] Connect the SSG to the RX ANT. SSG setting Frequency: [Low], [Low'], [Center], [High'], [High] Output : 12dB SINAD level -1dB MOD: 1.0kHz DEV: ±3.0kHz	SSG	Rear	RX ANT		PC ADJ		Press [Apply] button to store the adjustment value.
	2) SSG output: OFF	Audio analyzer Oscilloscope					Check	<b>Note:</b> Write the fixed value of "33" when the adjustment value is 27 or less.  The squelch shall be closed.



## 调 整

## 接收部分

项 目	条 件	测 量			调 整			规 格 / 备 注
		测量装置	单元	端子	单元	部件	方 法	
1. RD 电平调整 [模拟宽带]	FPU 测试模式 1)调整项目:[RD 电平(模拟 宽带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:所需频率 输出:-53dBm(501μV) MOD:1.0kHz DEV:±3.0kHz	SSG AF VTVM	后面	RX ANT  CONTROL I/O 插孔 RD (10 脚)		PC 调整	80mV	±5mV  按 [应用] 按钮储存调整值。
2. RD 电平调整 [模拟窄带]	FPU 测试模式 1)调整项目:[RD 电平(模拟 窄带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:所需频率 输出:-53dBm(501μV) MOD:1.0kHz DEV:±1.5kHz							
3. RA 电平调整 [模拟宽带]	FPU 测试模式 1)调整项目:[RA 电平(模拟 宽带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:所需频率 输出:-53dBm(501μV) MOD:1.0kHz DEV:±3.0kHz	SSG AF VTVM	后面	RX ANT  CONTROL I/O 插孔 RA (11 脚)		PC 调整	400mV	±20mV  按 [应用] 按钮储存调整值。
4. RA 电平调整 [模拟窄带]	FPU 测试模式 1)调整项目:[RA 电平(模拟 窄带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:所需频率 输出:-53dBm(501μV) MOD:1.0kHz DEV:±1.5kHz							
5. 静噪(浅) 调整 [模拟宽带]	FPU 测试模式 1)调整项目:[静噪(浅)(模 拟宽带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高],[高'] 输出 :12dB SINAD 电平-1dB MOD: 1.0kHz DEV: ±3.0kHz	SSG 音频分析 仪器 示波器	后面	RX ANT		PC 调整		按 [应用] 按钮储存调整值。  <b>注意:</b> 调整值为 27 或更低时, 写入 固定值“33”。
	2)SSG 输出:OFF						检查	静噪应关闭。

## ADJUSTMENT

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

## 调 整

项 目	条 件	测 量			调 整			规 格 / 备 注
		测量装置	单元	端子	单元	部件	方 法	
6. 静噪 (浅) 调整 [模拟窄带]	FPU 测试模式 1) 调整项目:[静噪(浅)](模拟窄带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高'],[高] 输出 :12dB SINAD 电平 -1dB MOD:1.0kHz DEV:±1.5kHz	SSG 音频分析仪 示波器	后面	RX ANT		PC 调整		按 [应用] 按钮储存调整值。  <b>注意:</b> 调整值为 24 或更低时, 写入固定值“30”。
						检查	静噪应关闭。	
7. 静噪 (浅) 调整 [NXDN 甚窄带]	FPU 测试模式 1) 调整项目:[静噪(浅)](NXDN 甚窄带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高'],[高] 输出:模拟窄带 -4dB 的 12dB SINAD 电平 MOD:OFF					PC 调整		按 [应用] 按钮储存调整值。
8. 静噪 (深) 调整 [模拟宽带]	FPU 测试模式 1) 调整项目:[静噪(深)](模拟宽带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高'],[高] 输出 :12dB SINAD 电平 +8dB MOD:1.0kHz DEV:±3.0kHz					PC 调整		按 [应用] 按钮储存调整值。
	2) SSG 输出 :OFF						检查	静噪应关闭。
9. 静噪 (深) 调整 [模拟窄带]	FPU 测试模式 1) 调整项目:[静噪(深)](模拟窄带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高'],[高] 输出 :12dB SINAD 电平 +8dB MOD:1.0kHz DEV:±1.5kHz					PC 调整		按 [应用] 按钮储存调整值。
	2) SSG 输出 :OFF						检查	静噪应关闭。

## ADJUSTMENT

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

## 调 整

项 目	条 件	测 量			调 整			规 格 / 备 注
		测量装置	单元	端子	单元	部件	方 法	
10. RSSI 基准调整 [模拟宽带]	FPU 测试模式 1)调整项目:[RSSI 参考(模拟宽带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高'],[高] 输出 :12dB SINAD 电平-1dB MOD:1.0kHz DEV:±3.0kHz	SSG 音频分析仪	后面	RX ANT		PC 调整		按 [应用] 按钮储存调整值。
11. RSSI 基准调整 [模拟窄带]	FPU 测试模式 1)调整项目:[RSSI 参考(模拟窄带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高'],[高] 输出 :12dB SINAD 电平-1dB MOD:1.0kHz DEV:±1.5kHz							
12. RSSI 基准调整 [NXDN 甚窄带]	FPU 测试模式 1)调整项目:[RSSI 参考(NXDN 甚窄带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高'],[高] 输出 :12dB SINAD 电平-1dB MOD:OFF							
13. 低 RSSI 调整 [模拟宽带]	FPU 测试模式 1)调整项目:[低 RSSI(模拟宽带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高'],[高] 输出:-118dBm(0.28μV) MOD:1.0kHz DEV:±3.0kHz	SSG	后面	RX ANT		PC 调整		按 [应用] 按钮储存调整值。
14. 低 RSSI 调整 [模拟窄带]	FPU 测试模式 1)调整项目:[低 RSSI(模拟窄带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高'],[高] 输出:-118dBm(0.28μV) MOD:1.0kHz DEV:±1.5kHz							

## ADJUSTMENT

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

## 调 整

项 目	条 件	测 量			调 整			规 格 / 备 注
		测量装置	单元	端子	单元	部件	方 法	
15. 低 RSSI 调整 [NXDN 甚窄带]	FPU 测试模式 1) 调整项目:[低 RSSI(NXDN 甚窄带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高],[高] 输出:-118dBm(0.28μV) MOD:0FF	SSG	后面	RX ANT		PC 调整		按 [应用] 按钮储存调整值。
16. 高 RSSI 调整 [模拟宽带]	FPU 测试模式 1) 调整项目:[高 RSSI(模拟宽带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高],[高] 输出:-70dBm(70.7μV) MOD:1.0kHz DEV:±3.0kHz	SSG	后面	RX ANT		PC 调整		按 [应用] 按钮储存调整值。
17. 高 RSSI 调整 [模拟窄带]	FPU 测试模式 1) 调整项目:[高 RSSI(模拟窄带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高],[高] 输出:-70dBm(70.7μV) MOD:1.0kHz DEV:±1.5kHz							
18. 高 RSSI 调整 [NXDN 甚窄带]	FPU 测试模式 1) 调整项目:[高 RSSI(NXDN 甚窄带)] 将 SSG 连接到 RX ANT。 SSG 设置 频率:[低],[低'], [中],[高],[高] 输出:-70dBm(70.7μV) MOD:0FF							
19. 接收灵敏度检查 [模拟宽带]	1) 将 SSG 连接到 RX ANT。 SSG 设置 频率:所需频率 输出:-53dBm(501μV) MOD:1.0kHz DEV:±3.0kHz AF:0.45V/4Ω	SSG 音频分析仪  示波器	后面	RX ANT  TEST/SPKR 插孔 (12脚) 4Ω 负载			检查	
[模拟窄带]	2) SSG 设置 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 1) Adjust Item: [High Transmit Power Limit Adjust] Frequency: [Low], [Low'], [Center], [High'], [High] Press [Transmit] button.	Power meter	Rear	TX ANT		PC ADJ	43W±1.5W	Press [Apply] button to store the adjustment value.
2. High Transmit Power Adjust	FPU Test mode 1) Adjust Item: [High Transmit Power] Frequency: [Low], [Low'], [Center], [High'], [High] Press [Transmit] button.						40W±0.5W	
3. Low Transmit Power Limit Adjust	FPU Test mode 1) Adjust Item: [Low Transmit Power Limit Adjust] Frequency: [Low], [Low'], [Center], [High'], [High] Press [Transmit] button.						28W±1.5W	
4. Low Transmit Power Adjust	FPU Test mode 1) Adjust Item: [High Transmit Power Adjust] Frequency: [Low], [Low'], [Center], [High'], [High] Press [Transmit] button.						5W±0.5W	
5. Maximum Deviation Adjust [NXDN Narrow]	FPU Test mode 1) Adjust Item: [Maximum Deviation (NXDN Narrow)]					PC ADJ	Write the value as followings (typical value) [Maximum Deviation (NXDN Narrow)] = 530	Press [Apply] button to store the adjustment value.
6. Maximum Deviation Adjust [NXDN Very Narrow]	FPU Test mode 1) Adjust Item: [Maximum Deviation (NXDN Very Narrow)]						Write the value as followings (typical value) [Maximum Deviation (NXDN Very Narrow)] = 530	
7. Maximum Deviation Adjust [Analog Wide]	FPU Test mode 1) Adjust Item: [Maximum Deviation (Analog Wide)]						Write the value as followings (typical value) [Maximum Deviation (Analog Wide)] = 530	
8. Maximum Deviation Adjust [Analog Narrow]	FPU Test mode 1) Adjust Item: [Maximum Deviation (Analog Narrow)]						Write the value as followings (typical value) [Maximum Deviation (Analog Narrow)] = 530	



## 调 整

### 发射部分

项 目	条 件	测 量			调 整			规 格 / 备 注
		测量装置	单元	端子	单元	部件	方 法	
1. 高发射功率限制调整	FPU 测试模式 1) 调整项目:[高发射功率限制调整] 频率:[低],[低'], [中],[高],[高] 按[发射]按钮。	功率计	后面	TX ANT		PC 调整	43W±1.5W	按[应用]按钮储存调整值。
2. 高发射功率调整	FPU 测试模式 1) 调整项目:[高发射功率] 频率:[低],[低'], [中],[高],[高] 按[发射]按钮。						40W±0.5W	
3. 低发射功率限制调整	FPU 测试模式 1) 调整项目:[低发射功率限制调整] 频率:[低],[低'], [中],[高],[高] 按[发射]按钮。						28W±1.5W	
4. 低发射功率调整	FPU 测试模式 1) 调整项目:[低发射功率调整] 频率:[低],[低'], [中],[高],[高] 按[发射]按钮。						5W±0.5W	
5. 最大频偏调整 [NXDN 窄带]	FPU 测试模式 1) 调整项目:[最大频偏(NXDN 窄带)]					PC 调整	写入以下值(典型值)。 [最大频偏(NXDN 窄带)]=530	按[应用]按钮储存调整值。
6. 最大频偏调整 [NXDN 甚窄带]	FPU 测试模式 1) 调整项目:[最大频偏(NXDN 甚窄带)]						写入以下值(典型值)。 [最大频偏(NXDN 甚窄带)]=530	
7. 最大频偏调整 [模拟宽带]	FPU 测试模式 1) 调整项目:[最大频偏(模拟宽带)]						写入以下值(典型值)。 [最大频偏(模拟宽带)]=530	
8. 最大频偏调整 [模拟窄带]	FPU 测试模式 1) 调整项目:[最大频偏(模拟窄带)]						写入以下值(典型值)。 [最大频偏(模拟窄带)]=530	

## ADJUSTMENT

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

## 调 整

项 目	条 件	测 量			调 整			规 格 / 备 注
		测量装置	单元	端子	单元	部件	方 法	
9. 平衡调整 [20Hz 调整]	FPU 测试模式 1) 调整项目:[平衡] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:3kHz HPF:OFF 去加重:OFF 2) 调整项目:[A:低],[A:中],[A:高],[B:低],[B:中],[B:高] 按[发射]按钮。 发射 20Hz。	频偏仪 示波器	后面	TX ANT		PC 调整	20Hz 频率的频偏固定到 2.05kHz 频偏。 更改 2kHz 调整值, 变成指定范围内 20Hz 的相同频偏。	2kHz 音调频偏在 20Hz 音调频偏的 $\pm 1.0\%$ 以内。  调整所有调整点之后, 按[全部应用]按钮储存调整值。
[2.0kHz 调整]	FPU 测试模式 1) 调整项目:[平衡] 勾选[2kHz 正弦波]复选框。 2) 调整项目:[A:低],[A:中],[A:高],[B:低],[B:中],[B:高] 按[发射]按钮。 发射时复选此项改为 2kHz。							
10. 标准调制 检查 [模拟宽带]	1) 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz HPF:OFF 去加重:OFF 检测器:(p-p)/2 2) 将 AG 连接到 MIC 连接器的 MIC 端子。 AG 频率:1kHz(正弦波) AG 输出电平 : 调整成 3kHz 频偏。	频偏仪 示波器 AG DVM	后面  前面	TX ANT  MIC			检查	5.0mV $\pm$ 1.5mV
[模拟窄带]	1) 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz HPF:OFF 去加重:OFF 检测器:(p-p)/2 2) 将 AG 连接到 MIC 连接器的 MIC 端子。 AG 频率:1kHz(正弦波) AG 输出电平 : 调整成 1.5kHz 频偏。							

## ADJUSTMENT

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

## 调 整

项 目	条 件	测 量			调 整			规 格 / 备 注
		测量装置	单元	端子	单元	部件	方 法	
11. TD 频偏调整 [模拟宽带]	FPU 测试模式 1)调整项目:[TD 频偏(模拟宽带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:3kHz, HPF:OFF 去加重:OFF 2)将 AG 连接到 CONTROL I/O 插孔的 TD 端子。 AG 频率:100Hz(正弦波) AG 输出电平 :0.5Vpp(177mVrms) 按[发射]按钮。	频偏仪 示波器 AG AF VTVM	后面	TX ANT  CONTROL I/O 插孔 TD (8脚)		PC 调整	0.75kHz 频偏	±0.1kHz  按[应用]按钮储存调整值。
12. TD 频偏调整 [模拟窄带]	FPU 测试模式 1)调整项目:[TD 频偏(模拟窄带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:3kHz, HPF:OFF 去加重:OFF 2)将 AG 连接到 CONTROL I/O 插孔的 TD 端子。 AG 频率:100Hz(正弦波) AG 输出电平 :0.5Vpp(177mVrms) 按[发射]按钮。							
13. 发射音频输入(TA)调整 [模拟宽带]	FPU 测试模式 1)调整项目:[发射音频输入(TA)(模拟宽带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz, HPF:OFF 去加重:OFF 2)将 AG 连接到 CONTROL I/O 插孔的 TA 端子。 AG 频率:1kHz(正弦波) AG 输出电平:280mVrms 按[发射]按钮。	频偏仪 示波器 AG AF VTVM	后面	TX ANT  CONTROL I/O 插孔 TA (9脚)		PC 调整	3.0kHz 频偏	±0.1kHz  按[应用]按钮储存调整值。
14. 发射音频输入(TA)调整 [模拟窄带]	FPU 测试模式 1)调整项目:[发射音频输入(TA)(模拟窄带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz, HPF:OFF 去加重:OFF 2)将 AG 连接到 CONTROL I/O 插孔的 TA 端子。 AG 频率:1kHz(正弦波) AG 输出电平:280mVrms 按[发射]按钮。						1.5kHz 频偏	±0.05kHz  按[应用]按钮储存调整值。

## ADJUSTMENT

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

## 调 整

项 目	条 件	测 量			调 整			规 格 / 备 注
		测量装置	单元	端子	单元	部件	方 法	
15. QT 频偏调整 [模拟宽带]	FPU 测试模式 1)调整项目:[QT 频偏(模拟宽带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:3kHz, HPF:OFF 去加重:OFF 检测器:p-p/2 按[发射]按钮。	频偏仪示波器	后面	TX ANT		PC调整	0.75kHz 频偏	±0.05kHz 按[应用]按钮储存调整值。
16. QT 频偏调整 [模拟窄带]	FPU 测试模式 1)调整项目:[QT 频偏(模拟窄带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:3kHz, HPF:OFF 去加重:OFF 检测器:p-p/2 按[发射]按钮。						0.35kHz 频偏	±0.05kHz 按[应用]按钮储存调整值。
17. DQT 频偏调整 [模拟宽带]	FPU 测试模式 1)调整项目:[DQT 频偏(模拟宽带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:3kHz, HPF:OFF 去加重:OFF 检测器:峰值保持 按[发射]按钮。						0.75kHz 频偏	±0.05kHz 按[应用]按钮储存调整值。
18. DQT 频偏调整 [模拟窄带]	FPU 测试模式 1)调整项目:[DQT 频偏(模拟窄带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:3kHz, HPF:OFF 去加重:OFF 检测器:峰值保持 按[发射]按钮。						0.35kHz 频偏	±0.05kHz 按[应用]按钮储存调整值。
19. DTMF 频偏调整 [模拟宽带]	FPU 测试模式 1)调整项目:[DTMF 频偏(模拟宽带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz, HPF:OFF 去加重:OFF 按[发射]按钮。	频偏仪示波器	后面	TX ANT		PC调整	3.0kHz 频偏	±0.1kHz 按[应用]按钮储存调整值。
20. DTMF 频偏调整 [模拟窄带]	FPU 测试模式 1)调整项目:[DTMF 频偏(模拟窄带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz, HPF:OFF 去加重:OFF 按[发射]按钮。						1.5kHz 频偏	±0.05kHz 按[应用]按钮储存调整值。

## ADJUSTMENT

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



## 调 整

项 目	条 件	测 量			调 整			规 格 / 备 注
		测量装置	单元	端子	单元	部件	方 法	
21. 测试音频偏调整 [模拟宽带]	FPU 测试模式 1)调整项目:[测试音频偏(模拟宽带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz HPF:OFF 去加重 :OFF 按 [发射] 按钮。	频偏仪示波器	后面	TX ANT		PC 调整	3.0kHz 频偏	±0.1kHz 按 [应用] 按钮储存调整值。
22. 测试音频偏调整 [模拟窄带]	FPU 测试模式 1)调整项目:[测试音频偏(模拟窄带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz HPF:OFF 去加重 :OFF 按 [发射] 按钮。						1.5kHz 频偏	±0.05kHz 按 [应用] 按钮储存调整值。
23. CW ID 频偏调整 [模拟宽带]	FPU 测试模式 1)调整项目:[CW ID 频偏(模拟宽带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz HPF:OFF 去加重 :OFF 按 [发射] 按钮。						2.0kHz 频偏	±0.1kHz 按 [应用] 按钮储存调整值。
24. CW ID 频偏调整 [模拟窄带]	FPU 测试模式 1)调整项目:[CW ID 频偏(模拟窄带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz HPF:OFF 去加重 :OFF 按 [发射] 按钮。						1.0kHz 频偏	±0.05kHz 按 [应用] 按钮储存调整值。
25. 礼貌音频偏调整 [模拟宽带]	FPU 测试模式 1)调整项目:[礼貌音频偏(模拟宽带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz HPF:OFF 去加重 :OFF 按 [发射] 按钮。						1.0kHz 频偏	±0.05kHz 按 [应用] 按钮储存调整值。
26. 礼貌音频偏调整 [模拟窄带]	FPU 测试模式 1)调整项目:[礼貌音频偏(模拟窄带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz HPF:OFF 去加重 :OFF 按 [发射] 按钮。						0.5kHz 频偏	±0.05kHz 按 [应用] 按钮储存调整值。

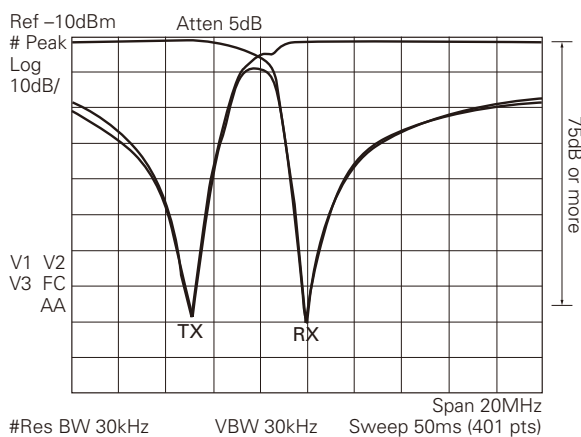
## ADJUSTMENT

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

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

#### 1. Confirmation of Duplexer alignment

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

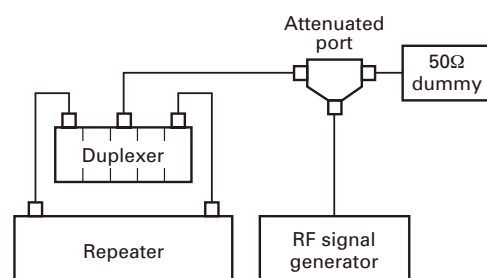


#### 2. Confirmation of Repeater Desensitization

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

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

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



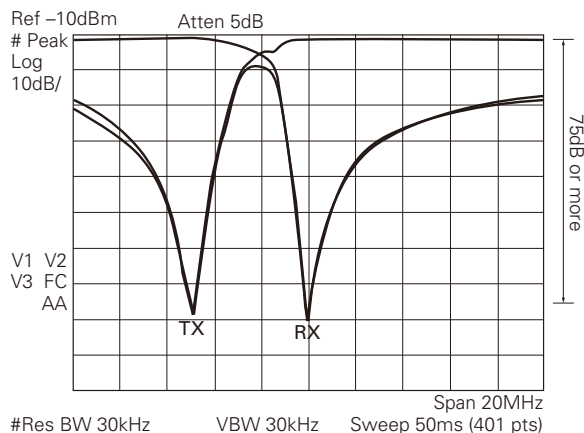
## 调整

项目	条件	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
27. 中继台增益调整 [模拟宽带]	FPU 测试模式 1) 调整项目:[中继台增益(模拟宽带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz HPF:OFF 去加重:OFF 2) 将 SSG 连接到 RX ANT。 SSG 设置 频率:所需频率 输出:-53dBm(501μV) MOD:1.0kHz DEV:±1.0kHz	频偏仪 示波器  SSG	后面	TX ANT  RX ANT		PC 调整	1.0kHz 频偏	±0.1kHz  按 [应用] 按钮储存调整值。
28. 中继台增益调整 [模拟窄带]	FPU 测试模式 1) 调整项目:[中继台增益(模拟窄带)] 将频偏仪通过 ATT 连接到 TX ANT 末端。 频偏仪设置 LPF:15kHz HPF:OFF 去加重:OFF 2) 将 SSG 连接到 RX ANT。 SSG 设置 频率:所需频率 输出:-53dBm(501μV) MOD:1.0kHz DEV:±1.0kHz							

### 确认和校正设置以防止接收灵敏度降低

#### 1. 双工器校正确认

双工器允许中继台同时进行发射和接收。为了达到这一目的，在编程的接收频率中，必须将发射频率陷波或抑制 75dB 或以上。另外，在编程的发射频率中，必须将接收频率陷波或抑制 75dB 或以上。下图是使用频谱分析器进行双工器校正的示例。

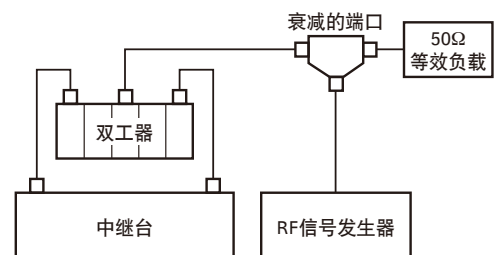


#### 2. 中继台灵敏度降低确认

下图是中继台灵敏度降低的测试设置。

完成此测试设置后，按照下述步骤确认中继台灵敏度降低状况。

- 1) 停用中继台模式。
- 2) 调整 RF 发生器的电平，直至达到 12dB SINAD。
- 3) 将 RF 发生器的输出增大 1dB。(这会增大 SINAD。)
- 4) 启用中继台模式。
- 5) 读取 SINAD 电平。它不应当下降到 12dB SINAD 以下。如果 SINAD 小于 12dB，请检查连接器的紧密性和双工器的调谐



## TERMINAL FUNCTION

### Final Unit (X45-3932-71) (A/3)

Pin No.	Name	I/O	Function
<b>CN1 (To X57-795 CN610)</b>			
1	TX IN	I	TX driver input signal (Coaxial)
<b>CN201 (To X45-393 B/3 +B)</b>			
1	+B	I	Power supply input
<b>CN202 (To X45-393 B/3 GND)</b>			
1	GND	-	Ground
<b>CN203 (To X57-795 CN701)</b>			
1	GND	-	Ground
2	+B	O	Power supply output
3	+B	O	Power supply output
<b>CN204 (To X57-795 CN801)</b>			
1	GND	-	Ground
2	8TC	I	8V power supply control
3	RAMP	I	RF power control voltage
4	ASWC	I	ANT switch control
5	FAN	I	FAN control
6	FDT	O	Coupler input voltage
7	TMP2	O	Temperature of X45 Final unit
8	TMP1	O	Temperature of X45 Final unit
9	PLIM	I	Power limit control
10	H/L	I	Power control
11	HWV2	O	Hardware version detect
<b>CN205 (To FAN)</b>			
1	FAB	O	FAN power supply
2	FAG	-	FAN ground

### Final Unit (X45-3932-71) (B/3)

Pin No.	Name	I/O	Function
<b>+B (To X45-393 A/3 CN201)</b>			
1	+B	O	Power supply output
<b>GND (To X45-393 A/3 CN202)</b>			
1	GND	-	Ground
<b>+B1 (To DC 13.6V)</b>			
1	+B	I	Power supply input
<b>GND (To DC 13.6V)</b>			
1	GND	-	Ground

### Final Unit (X45-3932-71) (C/3)

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

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

Pin No.	Name	I/O	Function
<b>CN5 (To X45-393 C/3)</b>			
1	N_SYNC1_B	I/O	RS-485 differential signal 1-B
2	N_SYNC1_A	I/O	RS-485 differential signal 1-A
3	N_SYNC2_B	I/O	RS-485 differential signal 2-B
4	N_SYNC2_A	I/O	RS-485 differential signal 2-A
5	N_SYNC1_B	I/O	RS-485 differential signal 1-B
6	N_SYNC1_A	I/O	RS-485 differential signal 1-A
7	N_SYNC2_B	I/O	RS-485 differential signal 2-B
8	N_SYNC2_A	I/O	RS-485 differential signal 2-A
<b>CN38 (To X57-795 CN800)</b>			
1	TMP1	I	Temperature of X45 Final unit
2	TMP2	I	Temperature of X45 Final unit
3	RAMP	O	RF power control voltage
4	FWD	I	RF power monitor voltage
5	TXASSIST	O	TX PLL assist voltage
6	RXASSIST	O	RX PLL assist voltage
7	TX_CV	I	TX VCO lock voltage
8	RX_CV	I	RX VCO lock voltage
9	GND	-	Ground
10	GND	-	Ground
11	TXVCOB	O	TX VCO B control signal
12	RXVCOA/B	O	RX VCO control signal to A or B
13	TXVCOA	O	TX VCO A control signal

## 端子功能

### 末级单元 (X45-3932-71)(A/3)

管脚号	名称	输入/输出	功能
CN1( 至 X57-795 CN610)			
1	TX IN	输入	TX 驱动器输入信号 (同轴)
CN201( 至 X45-393 B/3 +B)			
1	+B	输入	电源输入
CN202( 至 X45-393 B/3 GND)			
1	GND	-	接地
CN203( 至 X57-795 CN701)			
1	GND	-	接地
2	+B	输出	电源输出
3	+B	输出	电源输出
CN204( 至 X57-795 CN801)			
1	GND	-	接地
2	8TC	输入	8V 电源控制
3	RAMP	输入	RF 功率控制电压
4	ASWC	输入	ANT 开关控制
5	FAN	输入	FAN 控制
6	FDT	输出	耦合器输入电压
7	TMP2	输出	X45 末级单元的温度
8	TMP1	输出	X45 末级单元的温度
9	PLIM	输入	功率极限控制
10	H/L	输入	功率控制
11	HWV2	输出	硬件版本检测
CN205( 至 FAN)			
1	FAB	输出	FAN 电源
2	FAG	-	FAN 接地

### 末级单元 (X45-3932-71)(B/3)

管脚号	名称	输入/输出	功能
+B( 至 X45-393 A/3 CN201)			
1	+B	输出	电源输出
GND( 至 X45-393 A/3 CN202)			
1	GND	-	接地
+B1( 至 DC 13.6V)			
1	+B	输入	电源输入
GND( 至 DC 13.6V)			
1	GND	-	接地

### 末级单元 (X45-3932-71)(C/3)

管脚号	名称	输入/输出	功能
N_SYNC1, 2( 至 X53-449 CN5)			
1	N_SYNC1_B	输入/输出	RS-485 差分信号 1-B
2	N_SYNC1_A	输入/输出	RS-485 差分信号 1-A
3	N_SYNC2_B	输入/输出	RS-485 差分信号 2-B
4	N_SYNC2_A	输入/输出	RS-485 差分信号 2-A
5	N_SYNC1_B	输入/输出	RS-485 差分信号 1-B
6	N_SYNC1_A	输入/输出	RS-485 差分信号 1-A
7	N_SYNC2_B	输入/输出	RS-485 差分信号 2-B
8	N_SYNC2_A	输入/输出	RS-485 差分信号 2-A
J401, 402(N_SYNC1, 2 插孔)			
1	N_SYNC2_A	输入/输出	RS-485 差分信号 2-A
2	N_SYNC2_B	输入/输出	RS-485 差分信号 2-B
3	N_SYNC1_A	输入/输出	RS-485 差分信号 1-A
4	N_SYNC1_B	输入/输出	RS-485 差分信号 1-B

### 控制单元 (X53-4490-10)

管脚号	名称	输入/输出	功能
CN5( 至 X45-393 C/3)			
1	N_SYNC1_B	输入/输出	RS-485 差分信号 1-B
2	N_SYNC1_A	输入/输出	RS-485 差分信号 1-A
3	N_SYNC2_B	输入/输出	RS-485 差分信号 2-B
4	N_SYNC2_A	输入/输出	RS-485 差分信号 2-A
5	N_SYNC1_B	输入/输出	RS-485 差分信号 1-B
6	N_SYNC1_A	输入/输出	RS-485 差分信号 1-A
7	N_SYNC2_B	输入/输出	RS-485 差分信号 2-B
8	N_SYNC2_A	输入/输出	RS-485 差分信号 2-A
CN38( 至 X57-795 CN800)			
1	TMP1	输入	X45 末级单元的温度
2	TMP2	输入	X45 末级单元的温度
3	RAMP	输出	RF 功率控制电压
4	FWD	输入	RF 功率监测电压
5	TXASSIST	输出	TX PLL 辅助电压
6	RXASSIST	输出	RX PLL 辅助电压
7	TX_CV	输入	TX VCO 锁定电压
8	RX_CV	输入	RX VCO 锁定电压
9	GND	-	接地
10	GND	-	接地
11	TXVCOB	输出	TX VCO B 控制信号
12	RXVCOA/B	输出	至 A 或 B 的 RX VCO 控制信号
13	TXVCOA	输出	TX VCO A 控制信号

## TERMINAL FUNCTION

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

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

## 端子功能

管脚号	名称	输入/输出	功能
14	/RXPCS_TR	输出	RX PLL 芯片选择信号
15	LDT	输入	TX PLL 锁定检测信号
16	/16_8PCS	输出	基准时钟 PLL 芯片选择信号
17	LDR	输入	RX PLL 锁定检测信号
18	/TXPCS	输出	TX PLL 芯片选择信号
19	SPSCLK0	输出	串行时钟
20	SPSD0	输出	串行数据
21	SBC	输出	+B 控制切换信号
22	GND	-	接地
23	MOD	输出	TX 调制的音频信号
24	GND	-	接地
25	RSSI	输入	RSSI 电压
26	AGC	输出	自动增益控制电压
27	33A	输出	3.3V 电压
28	/EWP	输出	EEPROM 写入控制信号
29	HWV1	输入	硬件版本信号
30	I2CCK	输出	串行时钟
31	SPSCLK1	输出	串行时钟
32	I2CDA	输入/输出	串行数据
33	SPSD1	输出	串行数据
34	/IOCS	输入	I/O 扩展器芯片选择信号
35	/EVCS	输出	DA 转换器芯片选择信号
36	NC	-	未连接
<b>CN39</b>			
IN	IF_SIG	输入	450kHz IF 信号
OUT	GND	-	接地
<b>CN40( 至 X54-373 CN502)</b>			
1	SB	输出	电源输入
2	SB	输出	电源输入
3	GND	-	接地
4	NC	-	未连接
5	DAT	输出	串行数据
6	PSW	输入	电源开关信号
7	STB1	输出	数据闭锁信号
8	CLK	输出	串行时钟
9	SOE	输出	输出启用信号
10	TXD1	输入/输出	MIC PTT, UART TX 数据
11	K1	输入	键扫描输入
12	RXD1	输入	挂钩检测信号, UART TX 数据
13	K2	输入	键扫描输入
14	K3	输入	键扫描输入

管脚号	名称	输入/输出	功能
15	K4	输出	键扫描输出
16	K5	输出	键扫描输出
17	VLI	输入	扬声器音频电平控制电压
18	5C	输出	5V 电压
19	MIG	-	MIC 接地
20	MIC	输入	MIC 信号
<b>CN41( 至 TEST/SPKR 15 针连接器 )</b>			
1	SB	输出	电源输出
2	SB	输出	电源输入
3	GND	-	接地
4	GND	-	接地
<b>CN42( 至 TEST/SPKR 15 针连接器 )</b>			
1	A05	输出	辅助输出 5
2	A04	输出	辅助输出 4
3	A03	输出	辅助输出 3
4	SPO	输出	扬声器 AF 输出
5	SPO	输出	扬声器 AF 输出
6	A02	输出	辅助输出 2
7	A01	输出	辅助输出 1
8	SPI	输入	内部扬声器 AF 输入
9	RSI	输出	RSSI 电压
10	RD	输出	RX 数据输出
11	SPG	-	扬声器接地
12	SPG	-	扬声器接地
<b>CN43( 至 INT SPKR)</b>			
1	SPO	输出	内部扬声器 AF 输出
2	SPG	-	扬声器接地
<b>CN44( 至 CONTROL I/O 25 针 D-sub 连接器 )</b>			
1	NC	-	未连接
2	NC	-	未连接
3	SPM_D25	输入	扬声器静音信号输入
4	I06_D25	输入/输出	可编程功能输入 / 输出 6
5	RXG	-	RA、RD 的 RX 信号接地
6	I05_D25	输入/输出	可编程功能输入 / 输出 5
7	RA_D25	输出	RX 音频输出 ( 语音 )
8	I04_D25	输入/输出	可编程功能输入 / 输出 4
9	RD_D25	输出	RX 数据输出 ( 数据或信令 )
10	I03_D25	输入/输出	可编程功能输入 / 输出 3
11	TA_D25	输入	TX 音频输入 ( 语音 )
12	I02_D25	输入/输出	可编程功能输入 / 输出 2
13	TD_D25	输入	TX 数据输出 ( 数据或信令 )

## TERMINAL FUNCTION

Pin No.	Name	I/O	Function
14	IO1_D25	I/O	Programmable function input/output 1
15	DG	-	Control line ground
16	TXG	-	TX signal ground for TA,TD
17	AI3_D25	I	Programmable function input 3
18	BER_DATA_D25	O	Bit error rate data
19	AI2_D25	I	Programmable function input 2
20	SC_D25	O	Squelch control output
21	AI1_D25	I	Programmable function input 1
22	/EPTT_D25	I	External PTT
23	TXD0_D25	O	UART TX data
24	EXT_MON_D25	I	External monitor signal
25	RXD0_D25	I	UART RX data
26	BER_CLK_D25	O	Bit error rate clock
27	NC (RSSI)		No connection (RSSI)
28	NC	-	No connection
29	NC	-	No connection
30	NC	-	No connection
<b>CN301 (To X57-795 CN700)</b>			
1	GND	-	Ground
2	+B	I	Power supply input
3	SB	I	Power supply input

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

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

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

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

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



## 端子功能

管脚号	名称	输入/输出	功能
14	I01_D25	输入/输出	可编程功能输入/输出 1
15	DG	-	控制线路接地
16	TXG	-	TA、TD 的 TX 信号接地
17	AI3_D25	输入	可编程功能输入 3
18	BER_DATA_D25	输出	比特误码率数据
19	AI2_D25	输入	可编程功能输入 2
20	SC_D25	输出	静噪控制输出
21	AI1_D25	输入	可编程功能输入 1
22	/EPTT_D25	输入	外部 PTT
23	TXDO_D25	输出	UART TX 数据
24	EXT_MON_D25	输入	外部监视器信号
25	RXDO_D25	输入	UART RX 数据
26	BER_CLK_D25	输出	比特误码率时钟
27	NC(RSSI)		未连接 (RSSI)
28	NC	-	未连接
29	NC	-	未连接
30	NC	-	未连接
CN301(至 X57-795 CN700)			
1	GND	-	接地
2	+B	输入	电源输入
3	SB	输入	电源输入

### 显示单元 (X54-3730-20) (A/2)

管脚号	名称	输入/输出	功能
CN501(至 X54-373 B/2 CN601)			
1	HK	输入	挂钩检测输入 /RXD 输入
2	MIC	输入	MIC 信号输入
3	MIG	-	MIC 接地
4	PTT	输入/输出	PTT 输入 /TDX 输出
5	GND	-	接地
6	NC	-	未连接
7	SB	输出	电源开关后的电源输出
8	NC	-	未连接
9	GND	-	接地
10	5M	输出	公共 5V 输出
11	VLI	输入	AF 信号的音量控制输入
CN502(至 X53-449 CN40)			
1	MIG	-	MIC 接地
2	MIC	输出	MIC 信号输出
3	VLI	输出	AF 信号的音量控制输出
4	5C	输入	公共 5V 输出

管脚号	名称	输入/输出	功能
5	K4	输入	键输入 4
6	K5	输入	键输入 5
7	K2	输出	键输入 2
8	K3	输出	键输入 3
9	K1	输出	键输入 1
10	HK/RXD	输出	挂钩检测输出 /RXD 输入
11	SOE	输入	移位寄存器输出启用
12	PTT/TXD	输入/输出	PTT 输出 /TDX 输入
13	STB1	输入	移位寄存器选通脉冲数据
14	CLK	输入	时钟数据输入
15	DAT	输入	串行数据输入
16	PSW	输出	电源开关输出
17	GND	-	接地
18	NC	-	未连接
19	SB	输入	电源开关后的电源输出
20	SB	输入	电源开关后的电源输出

### 显示单元 (X54-3730-20) (B/2)

管脚号	名称	输入/输出	功能
CN601(至 X54-373 A/2 CN501)			
1	VLI	输出	AF 信号的音量控制输出
2	5M	输入	公共 5V 输入
3	GND	-	接地
4	NC	-	未连接
5	SB	输入	电源开关后的电源输出
6	NC	-	未连接
7	GND	-	接地
8	PTT	输入/输出	PTT 输出 /TDX 输入
9	MIG	-	MIC 接地
10	MIC	输出	MIC 信号输出
11	HK	输出	挂钩检测输出 /RXD 输出
J601(MIC 插孔)			
1	NC	-	未连接
2	SB	输出	电源开关后的电源输出
3	GND	-	接地
4	PTT/TXD	输入/输出	PTT 输入 /TDX 输出
5	MIG	-	MIC 接地
6	MIC	输入	MIC 信号输入
7	HOOK/RXD	输入	挂钩检测输入 /RXD 输入
8	NC	-	未连接

## TERMINAL FUNCTION

### TX-RX Unit (X57-7952-71)

Pin No.	Name	I/O	Function
<b>CN101 (To RX ANT)</b>			
1	RX_SIGNAL	I	Receive signal input (Coaxial)
<b>CN202 (To X58-509 CN350)</b>			
1	GND	-	Ground
2	NC	-	No connection
3	80C_2	O	8V power supply
4	RXVCOA/B	O	VCO select
5	RX_CV	I	Control voltage input
6	NC	-	No connection
7	RXASSIST	O	Assist voltage output
<b>CN203 (To X58-509 CN351)</b>			
1	VO	I	VCO input
2	GND	-	Ground
<b>CN204 (To X58-509 CN303)</b>			
1	FIN	O	VCO output
2	SPSCLK0	O	PLL clock output
3	/RXPCS_TR	O	PLL chip select output
4	SPSD0	O	PLL data output
5	33C	O	3.3V power supply
6	50C	O	5V power supply
7	LDR	I	PLL lock detect input
8	REF	O	19.2MHz reference clock output
<b>CN500 (To Ext IN)</b>			
1	REF IN	I	External reference input (Coaxial)
<b>CN605 (To X58-510 CN350)</b>			
1	GND	-	Ground
2	TXVCOB	O	VCO B select
3	80C_1	O	8V power supply
4	TXVCOA	O	VCO A select
5	TX_CV	I	Control voltage input
6	MO	O	Modulation output
7	TXASSIST	O	Assist voltage output
<b>CN608 (To X58-510 CN351)</b>			
1	VO	I	VCO input
2	GND	-	Ground
<b>CN609 (To X58-510 CN303)</b>			
1	FIN	O	VCO output
2	SPSCLK0	O	PLL clock output
3	/TXPCS	O	PLL chip select output
4	SPSD0	O	PLL data output

Pin No.	Name	I/O	Function
5	33C	O	3.3V power supply
6	50C	O	5V power supply
7	LDT	I	PLL lock detect input
8	REF	O	16.8MHz reference clock output
<b>CN610 (To X45-393 A/3 CN1)</b>			
1	TX OUT	O	TX driver output signal (Coaxial)
<b>CN700 (To X53-449 CN301)</b>			
1	GND	-	Ground
2	+B	O	Power supply output
3	SB	O	Power supply output
<b>CN701 (To X45-393 A/3 CN203)</b>			
1	GND	-	Ground
2	+B	I	Power supply input
3	+B	I	Power supply input
<b>CN800 (To X53-449 CN38)</b>			
1	NC	-	No connection
2	/EVCS	I	DA converter chip select signal
3	/IOCS	O	IO expander chip select signal
4	SPSD1	I	Serial data
5	I2CDA	I/O	Serial data
6	SPSCLK1	I	Serial clock
7	I2CCK	I	Serial clock
8	HWW1	O	Hardware version signal
9	/EWP	I	EEPROM write control signal
10	33A	I	3.3V voltage
11	AGC	I	Auto gain control voltage
12	RSSI	O	RSSI voltage
13	GND	-	Ground
14	MOD	I	Audio signal for TX modulation
15	GND	-	Ground
16	SBC	I	Switched +B control signal
17	SPSD0	I	Serial data
18	SPSCLK0	I	Serial clock
19	/TXPCS	I	TX PLL chip select signal
20	LDR	O	RX PLL lock detect signal
21	/16_8PCS	I	Reference clock PLL chip select signal
22	LDT	O	TX PLL lock detect signal
23	/RXPCS_TR	I	RX PLL chip select signal
24	TXVCOA	I	TX VCO A control signal
25	RXVCOA/B	I	RX VCO control signal to A or B
26	TXVCOB	I	TX VCO B control signal

## 端子功能

### TX-RX 单元 (X57-7952-71)

管脚号	名称	输入/输出	功能
<b>CN101( 至 RX ANT)</b>			
1	RX_SIGNAL	输入	接收信号输入 (同轴)
<b>CN202( 至 X58-509 CN350)</b>			
1	GND	-	接地
2	NC	-	未连接
3	80C_2	输出	8V 电源
4	RXVCOA/B	输出	VCO 选择
5	RX_CV	输入	控制电压输入
6	NC	-	未连接
7	RXASSIST	输出	辅助电压输出
<b>CN203( 至 X58-509 CN351)</b>			
1	VO	输入	VCO 输入
2	GND	-	接地
<b>CN204( 至 X58-509 CN303)</b>			
1	FIN	输出	VCO 输出
2	SPSCLK0	输出	PLL 时钟输出
3	/RXPCS_TR	输出	PLL 芯片选择输出
4	SPSD0	输出	PLL 数据输出
5	33C	输出	3.3V 电源
6	50C	输出	5V 电源
7	LDR	输入	PLL 锁定检测输入
8	REF	输出	19.2MHz 基准时钟输出
<b>CN500( 至 Ext IN)</b>			
1	REF IN	输入	外部基准输入 (同轴)
<b>CN605( 至 X58-510 CN350)</b>			
1	GND	-	接地
2	TXVCOB	输出	VCO B 选择
3	80C_1	输出	8V 电源
4	TXVCOA	输出	VCO A 选择
5	TX_CV	输入	控制电压输入
6	MO	输出	调制输出
7	TXASSIST	输出	辅助电压输出
<b>CN608( 至 X58-510 CN351)</b>			
1	VO	输入	VCO 输入
2	GND	-	接地
<b>CN609( 至 X58-510 CN303)</b>			
1	FIN	输出	VCO 输出
2	SPSCLK0	输出	PLL 时钟输出
3	/TXPCS	输出	PLL 芯片选择输出
4	SPSD0	输出	PLL 数据输出

管脚号	名称	输入/输出	功能
5	33C	输出	3.3V 电源
6	50C	输出	5V 电源
7	LDT	输入	PLL 锁定检测输入
8	REF	输出	16.8MHz 基准时钟输出
<b>CN610( 至 X45-393 A/3 CN1)</b>			
1	TX OUT	输出	TX 驱动器输出信号 (同轴)
<b>CN700( 至 X53-449 CN301)</b>			
1	GND	-	接地
2	+B	输出	电源输出
3	SB	输出	电源输出
<b>CN701( 至 X45-393 A/3 CN203)</b>			
1	GND	-	接地
2	+B	输入	电源输入
3	+B	输入	电源输入
<b>CN800( 至 X53-449 CN38)</b>			
1	NC	-	未连接
2	/EVCS	输入	DA 转换器芯片选择信号
3	/IOCS	输出	IO 扩展器芯片选择信号
4	SPSD1	输入	串行数据
5	I2CDA	输入/输出	串行数据
6	SPSCLK1	输入	串行时钟
7	I2CCK	输入	串行时钟
8	HWV1	输出	硬件版本信号
9	/EWP	输入	EEPROM 写入控制信号
10	33A	输入	3.3V 电压
11	AGC	输入	自动增益控制电压
12	RSSI	输出	RSSI 电压
13	GND	-	接地
14	MOD	输入	TX 调制的音频信号
15	GND	-	接地
16	SBC	输入	+B 控制切换信号
17	SPSD0	输入	串行数据
18	SPSCLK0	输入	串行时钟
19	/TXPCS	输入	TX PLL 芯片选择信号
20	LDR	输出	RX PLL 锁定检测信号
21	/16_8PCS	输入	基准时钟 PLL 芯片选择信号
22	LDT	输出	TX PLL 锁定检测信号
23	/RXPCS_TR	输入	RX PLL 芯片选择信号
24	TXVCOA	输入	TX VCO A 控制信号
25	RXVCOA/B	输入	至 A 或 B 的 RX VCO 控制信号
26	TXVCOB	输入	TX VCO B 控制信号

## TERMINAL FUNCTION

Pin No.	Name	I/O	Function
27	GND	-	Ground
28	GND	-	Ground
29	RX_CV	O	RX VCO lock voltage
30	TX_CV	O	TX VCO lock voltage
31	RXASSIST	I	RX PLL assist voltage
32	TXASSIST	I	TX PLL assist voltage
33	FWD	O	RF power monitor voltage
34	RAMP	I	RF power control voltage
35	TMP2	O	Temperature of X45 Final unit
36	TMP1	O	Temperature of X45 Final unit
<b>CN801 (To X45-393 A/3 CN204)</b>			
1	HVV2	I	Hardware version detect
2	H/L	O	Power control
3	PLIM	O	Power limit control
4	TMP1	I	Temperature of X45 Final unit
5	TMP2	I	Temperature of X45 Final unit
6	FDT	I	Coupler input voltage
7	FAN	O	FAN control
8	ASWC	O	ANT switch control
9	RAMP	O	RF power control voltage
10	8TC	O	8V power supply control
11	GND	-	Ground
<b>CN802 (To X53-449 CN39)</b>			
1	IF_SIG	O	450kHz IF signal (Coaxial)

### RX VCO/PLL Unit (X58-5090-10)

Pin No.	Name	I/O	Function
<b>CN303 (To X57-795 CN204)</b>			
1	FIN	I	VCO input
2	SPSCLK0	I	PLL clock input
3	/RXPCS_TR	I	PLL chip select input
4	SPSD0	I	PLL data input
5	33C	I	3.3V power supply
6	50C	I	5V power supply
7	LDR	O	PLL Lock detect output
8	REF	I	19.2MHz reference clock input

Pin No.	Name	I/O	Function
<b>CN350 (To X57-795 CN202)</b>			
1	GND	-	Ground
2	NC	-	No connection
3	80C_2	I	8V power supply
4	RXVCOA/B	I	VCO select
5	RX_CV	O	Control voltage output
6	NC	-	No connection
7	RXASSIST	I	Assist voltage input
<b>CN351 (To X57-795 CN203)</b>			
1	VO	O	VCO output
2	GND	-	Ground

### TX VCO/PLL Unit (X58-5100-10)

Pin No.	Name	I/O	Function
<b>CN303 (To X57-795 CN609)</b>			
1	FIN	I	VCO input
2	SPSCLK0	I	PLL clock input
3	/TXPCS	I	PLL chip select input
4	SPSD0	I	PLL data input
5	33C	I	3.3V power supply
6	50C	I	5V power supply
7	LDT	O	PLL lock detect output
8	REF	I	16.8MHz reference clock input
<b>CN350 (To X57-795 CN605)</b>			
1	GND	-	Ground
2	TXVCOB	I	VCO B select
3	80C_1	I	8V power supply
4	TXVCOA	I	VCO A select
5	TX_CV	O	Control voltage output
6	MO	I	Modulation input
7	TXASSIST	I	Assist voltage input
<b>CN351 (To X57-795 CN608)</b>			
1	VO	O	VCO output
2	GND	-	Ground

## 端子功能

管脚号	名称	输入/输出	功能
27	GND	-	接地
28	GND	-	接地
29	RX_CV	输出	RX VCO 锁定电压
30	TX_CV	输出	TX VCO 锁定电压
31	RXASSIST	输入	RX PLL 辅助电压
32	TXASSIST	输入	TX PLL 辅助电压
33	FWD	输出	RF 功率监测电压
34	RAMP	输入	RF 功率控制电压
35	TMP2	输出	X45 末级单元的温度
36	TMP1	输出	X45 末级单元的温度
<b>CN801( 至 X45-393 A/3 CN204)</b>			
1	HWV2	输入	硬件版本检测
2	H/L	输出	功率控制
3	PLIM	输出	功率极限控制
4	TMP1	输入	X45 末级单元的温度
5	TMP2	输入	X45 末级单元的温度
6	FDT	输入	耦合器输入电压
7	FAN	输出	FAN 控制
8	ASWC	输出	ANT 开关控制
9	RAMP	输出	RF 功率控制电压
10	8TC	输出	8V 电源控制
11	GND	-	接地
<b>CN802( 至 X53-449 CN39)</b>			
1	IF_SIG	输出	450kHz IF 信号 (同轴)

### RX VCO/PLL 单元 (X58-5090-10)

管脚号	名称	输入/输出	功能
<b>CN303( 至 X57-795 CN204)</b>			
1	FIN	输入	VCO 输入
2	SPSCLK0	输入	PLL 时钟输入
3	/RXPCS_TR	输入	PLL 芯片选择输入
4	SPSD0	输入	PLL 数据输入
5	33C	输入	3.3V 电源
6	50C	输入	5V 电源
7	LDR	输出	PLL 锁定检测输出
8	REF	输入	19.2MHz 基准时钟输入

管脚号	名称	输入/输出	功能
<b>CN350( 至 X57-795 CN202)</b>			
1	GND	-	接地
2	NC	-	未连接
3	80C_2	输入	8V 电源
4	RXVCOA/B	输入	VCO 选择
5	RX_CV	输出	控制电压输出
6	NC	-	未连接
7	RXASSIST	输入	辅助电压输入
<b>CN351( 至 X57-795 CN203)</b>			
1	VO	输出	VCO 输出
2	GND	-	接地

### TX VCO/PLL 单元 (X58-5100-10)

管脚号	名称	输入/输出	功能
<b>CN303( 至 X57-795 CN609)</b>			
1	FIN	输入	VCO 输入
2	SPSCLK0	输入	PLL 时钟输入
3	/TXPCS	输入	PLL 芯片选择输入
4	SPSD0	输入	PLL 数据输入
5	33C	输入	3.3V 电源
6	50C	输入	5V 电源
7	LDT	输出	PLL 锁定检测输出
8	REF	输入	16.8MHz 基准时钟输入
<b>CN350( 至 X57-795 CN605)</b>			
1	GND	-	接地
2	TXVCOB	输入	VCO B 选择
3	80C_1	输入	8V 电源
4	TXVCOA	输入	VCO A 选择
5	TX_CV	输出	控制电压输出
6	MO	输入	调制输入
7	TXASSIST	输入	辅助电压输入
<b>CN351( 至 X57-795 CN608)</b>			
1	VO	输出	VCO 输出
2	GND	-	接地

## TERMINAL FUNCTION

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

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

## 端子功能

## CONTROL I/O 25 针脚 D-sub 连接器

管脚号	针脚名称	输入/输出	信号类型	信号概述	规格	最小	标准	最大	单位	备注
1	NC (RSSI)	-	-	-	-	-	-	-	-	
2	RXD 2	输入	数字	串行数据输入 2 RS-232C 电平	-	-15	-	+15	V	
3	TXD 2	输出	数字	串行数据输出 2 RS-232C 电平	-	±3.5	±4.2		V	
4	AI1	输入	数字	可编程功能输入 1 /CMOS	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
					输入阻抗		47k		Ohm	至 V <sub>cc</sub> 的 47k ohm PU
5	AI2	输入	数字	可编程功能输入 2 /CMOS	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
					输入阻抗		47k		Ohm	至 V <sub>cc</sub> 的 47k ohm PU
6	AI3	输入	数字	可编程功能输入 3 /CMOS	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
					输入阻抗		47k		Ohm	至 V <sub>cc</sub> 的 47k ohm PU
7	DG	-	GND	数字 GND	-	-	-	-	-	
8	TD	输入	模拟	TX 数据输入 (信令)	输入 :0.1kHz/0.5V <sub>p-p</sub>	0.7	0.75	0.8	kHzDEV	NFM/WFM
					输入阻抗		600		Ohm	施加于 GND 的 600 ohm PD。
9	TA	输入	模拟	TX 音频输入 (语音)	1kHz/60% 频偏	270	280	290	mV	
					输入阻抗		600		Ohm	施加于 GND 的 600 ohm PD。
10	RD	输出	模拟	RX 数据输出 (信令) 无静噪	输入 :60% 频偏	75	80	85	mV	
11	RA	输出	模拟	RX 音频输出 (语音) 静噪	输入 :60% 频偏	380	400	420	mV	
12	RXG	-	GND	RX 信号 GND	-	-	-	-	-	
13	SPM	输入	数字	扬声器静音 /CMOS	VIH	0.7V <sub>cc</sub>	-	5.5	V	V <sub>cc</sub> =3.3V±2%
					VIL	-	-	0.3V <sub>cc</sub>	V	
					输入阻抗		47k		Ohm	至 V <sub>cc</sub> 的 47k ohm PU
14	BER_CLK	输出	数字	用于比特误码率 时钟	VOH (I <sub>O</sub> =-20μA)	4.4	4.5		V	至 V <sub>cc</sub> 的 47k ohm PU
					VOL (I <sub>O</sub> =20μA)		0	0.1	V	
15	EMON	输入	数字	外部监视器开关	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
					输入阻抗		47k		Ohm	
16	EPTT	输入	数字	外部 PTT 开关	VIH	2.0			V	V <sub>cc</sub> =5V±2%
					VIL			0.8	V	
					输入阻抗		47k		Ohm	
17	SC	输出	数字	静噪控制	VOH (V <sub>cc</sub> =5V, I <sub>O</sub> =-3mA)	V <sub>cc</sub> -0.7			V	至 V <sub>cc</sub> 的 47k ohm PU
					VOL (V <sub>cc</sub> =5V, I <sub>O</sub> =8mA)			0.6	V	
18	BER_DAT	输出	数字	用于比特误码率 时钟	VOH (I <sub>O</sub> =-20μA)	4.4	4.5		V	至 V <sub>cc</sub> 的 47k ohm PU
					VOL (I <sub>O</sub> =20μA)		0	0.1	V	

## TERMINAL FUNCTION

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



## 端子功能

管脚号	针脚名称	输入/输出	信号类型	信号概述	规格	最小	标准	最大	单位	备注
19	TXG	-	GND	TX 信号 GND	-	-	-	-	-	
20	I01	输入	数字	可编程功能输入 / 输出 1	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
					输入阻抗			47k		0hm
		输出			VOH(V <sub>cc</sub> =5V, I <sub>O</sub> =-3mA)	V <sub>cc</sub> -0.7			V	至 V <sub>cc</sub> 的 47k ohm PU
					VOL(V <sub>cc</sub> =5V, I <sub>O</sub> =8mA)			0.6	V	
21	I02	输入	数字	可编程功能输入 / 输出 2	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
					输入阻抗			47k		0hm
		输出			VOH(V <sub>cc</sub> =5V, I <sub>O</sub> =-3mA)	V <sub>cc</sub> -0.7			V	至 V <sub>cc</sub> 的 47k ohm PU
					VOL(V <sub>cc</sub> =5V, I <sub>O</sub> =8mA)			0.6	V	
22	I03	输入	数字	可编程功能输入 / 输出 3	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
					输入阻抗			47k		0hm
		输出			VOH(V <sub>cc</sub> =5V, I <sub>O</sub> =-3mA)	V <sub>cc</sub> -0.7			V	至 V <sub>cc</sub> 的 47k ohm PU
					VOL(V <sub>cc</sub> =5V, I <sub>O</sub> =8mA)			0.6	V	
23	I04	输入	数字	可编程功能输入 / 输出 4	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
					输入阻抗			47k		0hm
		输出			VOH(V <sub>cc</sub> =5V, I <sub>O</sub> =-3mA)	V <sub>cc</sub> -0.7			V	至 V <sub>cc</sub> 的 47k ohm PU
					VOL(V <sub>cc</sub> =5V, I <sub>O</sub> =8mA)			0.6	V	
24	I05	输入	数字	可编程功能输入 / 输出 5	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
					输入阻抗			47k Ω		V
		输出			VOH(V <sub>cc</sub> =5V, I <sub>O</sub> =-3mA)	V <sub>cc</sub> -0.7			V	至 V <sub>cc</sub> 的 47k ohm PU
					VOL(V <sub>cc</sub> =5V, I <sub>O</sub> =8mA)			0.6	V	
25	I06	输入	数字	可编程功能输入 / 输出 6	VIH	0.8V <sub>cc</sub>		V <sub>cc</sub>	V	V <sub>cc</sub> =5V±2%
					VIL	0		0.2V <sub>cc</sub>	V	
					输入阻抗			47k Ω		V
		输出			VOH(V <sub>cc</sub> =5V, I <sub>O</sub> =-3mA)	V <sub>cc</sub> -0.7			V	至 V <sub>cc</sub> 的 47k ohm PU
					VOL(V <sub>cc</sub> =5V, I <sub>O</sub> =8mA)			0.6	V	

## TERMINAL FUNCTION

### TEST/SPKR 15 pin Connector

Pin No.	Pin Name	I/O	Signal Type	Configuration Change	Signal Summary	Specification	Min	Typ	Max	Unit	Remarks
1	SB	-	-	No	Power Supply	Voltage value	10.8	13.6	15.6	V	
						Supply current			1	A	
2	SB	-	-	No	Power Supply	Voltage value	10.8	13.6	15.6	V	
						Supply current			1	A	
3	NC	-	-	-	-	-					
4	GND	-	GND	No	Digital GND						
5	GND	-	GND	No	Digital GND						
6	SPG	-	GND	No	Speaker GND		-	-			
7	RD	O	Analog	No	RX Data Output (signaling) Not squelched	INPUT: 60% Dev.	75	80	85	mV	
8	RSSI	O	Analog	No	RSSI Output	Amplitude value	0		3.3	V	
						Allowable Load value	10k			Ohm	
9	SPI	I	Analog	No	Internal Speaker Input		-	-	-		
10	AO1	O	Digital	default	Auxiliary Output 1 Open collector	External voltage value			16	V	
						Supply current			200	mA	
				R203	Auxiliary Output 1 Open collector with PU	PU resistor	4.7k	47k	47k	Ohm	Vcc=5V±2%
						VOL (IO=0mA)			0.1	V	
11	AO2	O	Digital	default	Auxiliary Output 2 Open collector	External Voltage value			16	V	
						Supply current			200	mA	
				R202	Auxiliary Output 2 Open collector with PU	PU resistor	4.7k	47k	47k	Ohm	Vcc=5V±2%
						VOL (IO=0mA)			0.1	V	
12	SPO	O	Analog	No	External Speaker Output	Output level			4	W	
13	AO3	O	Digital	default	Auxiliary Output 3 Open collector	External voltage value			16	V	
						Supply current			200	mA	
				R201	Auxiliary Output 3 Open collector with PU	PU resistor	4.7k	47k	47k	Ohm	Vcc=5V±2%
						VOL (IO=0mA)			0.1	V	
14	AO4	O	Digital	default	Auxiliary Output 4 Open collector	External voltage value			16	V	
						Supply current			200	mA	
				R200	Auxiliary Output 4 Open collector with PU	PU resistor	4.7k	47k	47k	Ohm	Vcc=5V±2%
						VOL (IO=0mA)			0.1	V	
15	AO5	O	Digital	default	Auxiliary Output 5 Open collector	External voltage value			16	V	
						Supply current			200	mA	
				R198	Auxiliary Output 5 Open collector with PU	PU resistor	4.7k	47k	47k	Ohm	Vcc=5V±2%
						VOL (IO=0mA)			0.1	V	

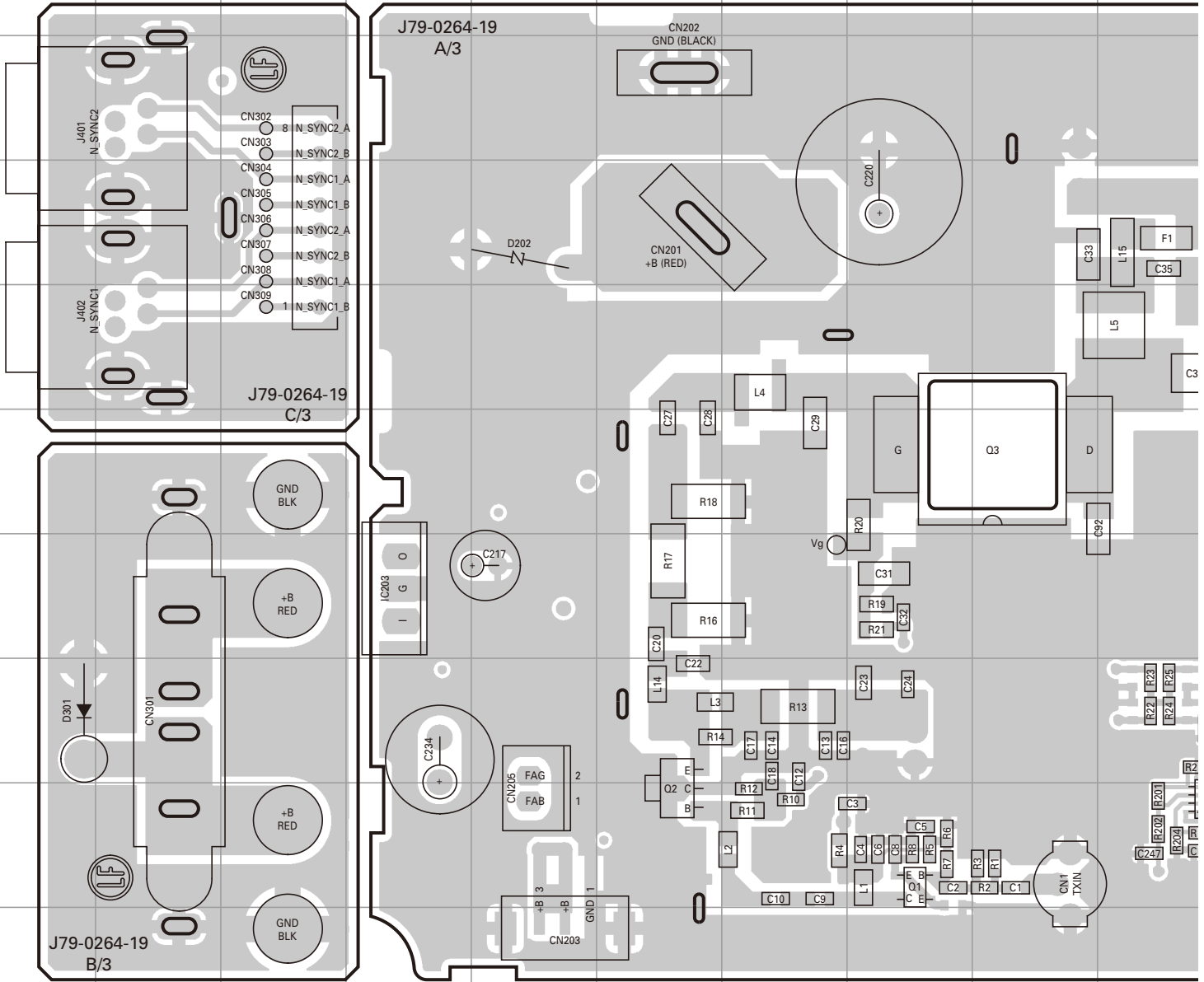
## 端子功能

## TEST/SPKR 15 引脚连接器

管脚号	引脚名称	输入/输出	信号类型	配置变化	信号概述	规格	最小	标准	最大	单位	备注
1	SB	-	-	否	电源	电压值	10.8	13.6	15.6	V	
						供电电流			1	A	
2	SB	-	-	否	电源	电压值	10.8	13.6	15.6	V	
						供电电流			1	A	
3	NC	-	-	-	-	-					
4	GND	-	GND	否	数字 GND						
5	GND	-	GND	否	数字 GND						
6	SPG	-	GND	否	扬声器 GND		-	-			
7	RD	输出	模拟	否	RX 数据输出 (信令) 无静噪	输入 :60% 频偏	75	80	85	mV	
8	RSSI	输出	模拟	否	RSSI 输出	幅值	0		3.3	V	
						容许负载值	10k			Ohm	
9	SPI	输入	模拟	否	内部扬声器输入		-	-	-		
10	A01	输出	数字	默认	辅助输出 1 开放式集电极	外部电压值			16	V	
						供电电流			200	mA	
				\$R203	辅助输出 1 PU 开放式集电极	PU 电阻器	4.7k	47k	47k	Ohm	V <sub>cc</sub> =5V±2%
						VOL (I <sub>O</sub> =0mA)			0.1	V	
11	A02	输出	数字	默认	辅助输出 2 开放式集电极	外部电压值			16	V	
						供电电流			200	mA	
				\$R202	辅助输出 2 PU 开放式集电极	PU 电阻器	4.7k	47k	47k	Ohm	V <sub>cc</sub> =5V±2%
						VOL (I <sub>O</sub> =0mA)			0.1	V	
12	SPO	输出	模拟	否	外部扬声器输出	输出电平			4	W	
13	A03	输出	数字	默认	辅助输出 3 开放式集电极	外部电压值			16	V	
						供电电流			200	mA	
				\$R201	辅助输出 3 PU 开放式集电极	PU 电阻器	4.7k	47k	47k	Ohm	V <sub>cc</sub> =5V±2%
						VOL (I <sub>O</sub> =0mA)			0.1	V	
14	A04	输出	数字	默认	辅助输出 4 开放式集电极	外部电压值			16	V	
						供电电流			200	mA	
				\$R200	辅助输出 4 PU 开放式集电极	PU 电阻器	4.7k	47k	47k	Ohm	V <sub>cc</sub> =5V±2%
						VOL (I <sub>O</sub> =0mA)			0.1	V	
15	A05	输出	数字	默认	辅助输出 5 开放式集电极	外部电压值			16	V	
						供电电流			200	mA	
				\$R198	辅助输出 5 PU 开放式集电极	PU 电阻器	4.7k	47k	47k	Ohm	V <sub>cc</sub> =5V±2%
						VOL (I <sub>O</sub> =0mA)			0.1	V	

# NXR-810 PC BOARD / PC板

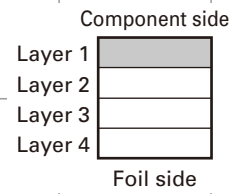
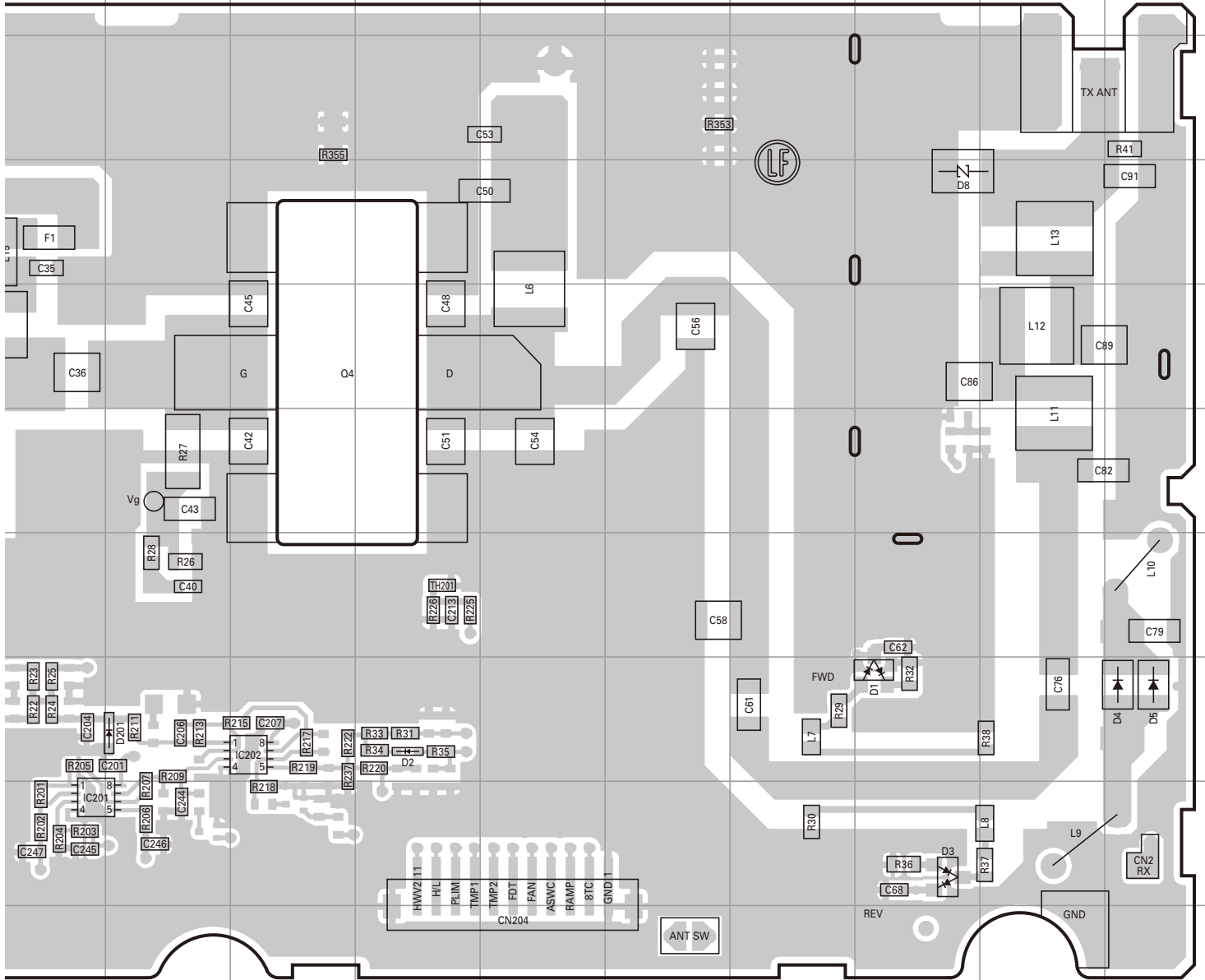
## FINAL UNIT (X45-3932-71) Component side view (J79-0264-19)



Ref. No.	Address	Ref. No.	Address
IC201	9J	D2	8M
IC202	8L	D3	9Q
IC203	7D	D4	8S
Q1	9H	D5	8S
Q2	9F	D8	4Q
Q3	6I	D201	8K
Q4	5L	D202	4E
D1	8Q	D301	8A

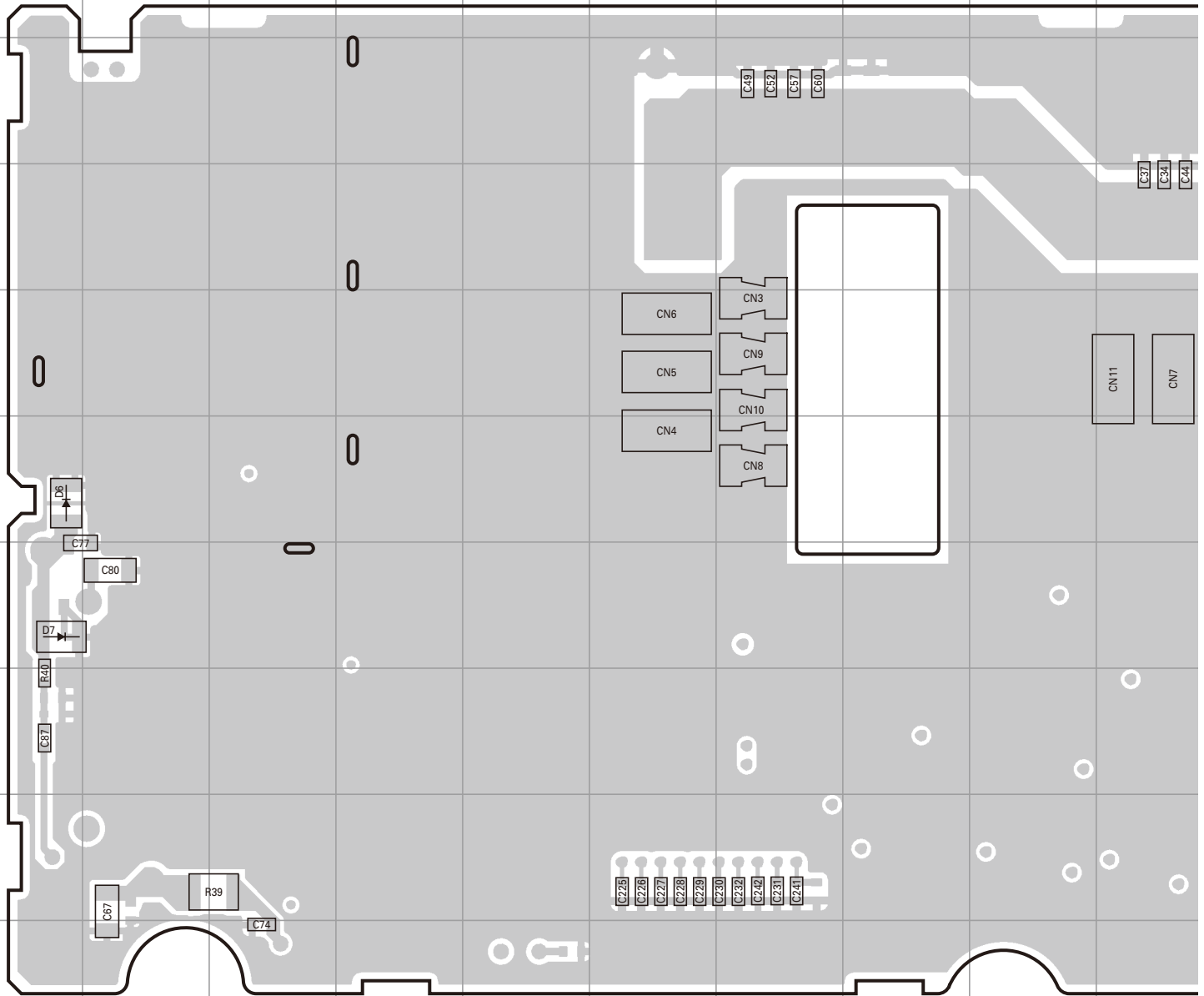
# PC BOARD / PC板 NXR-810

FINAL UNIT (X45-3932-71)  
Component side view (J79-0264-19)



# NXR-810 PC BOARD / PC板

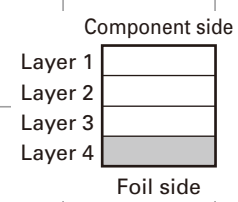
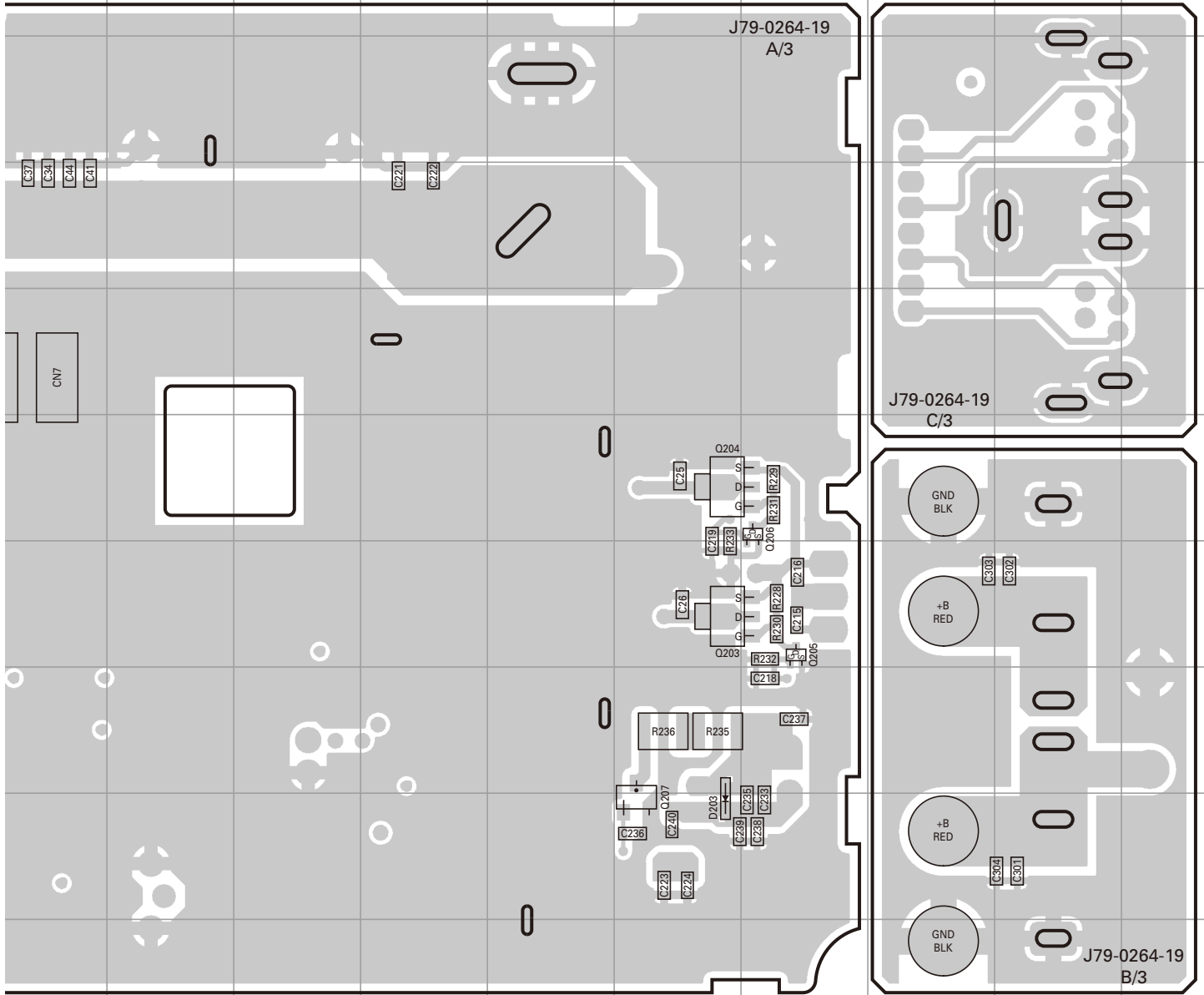
FINAL UNIT (X45-3932-71)  
Foil side view (J79-0264-19)



Ref. No.	Address
Q203	70
Q204	60
Q205	7P
Q206	6P
Q207	90
D6	6A
D7	7A
D203	90

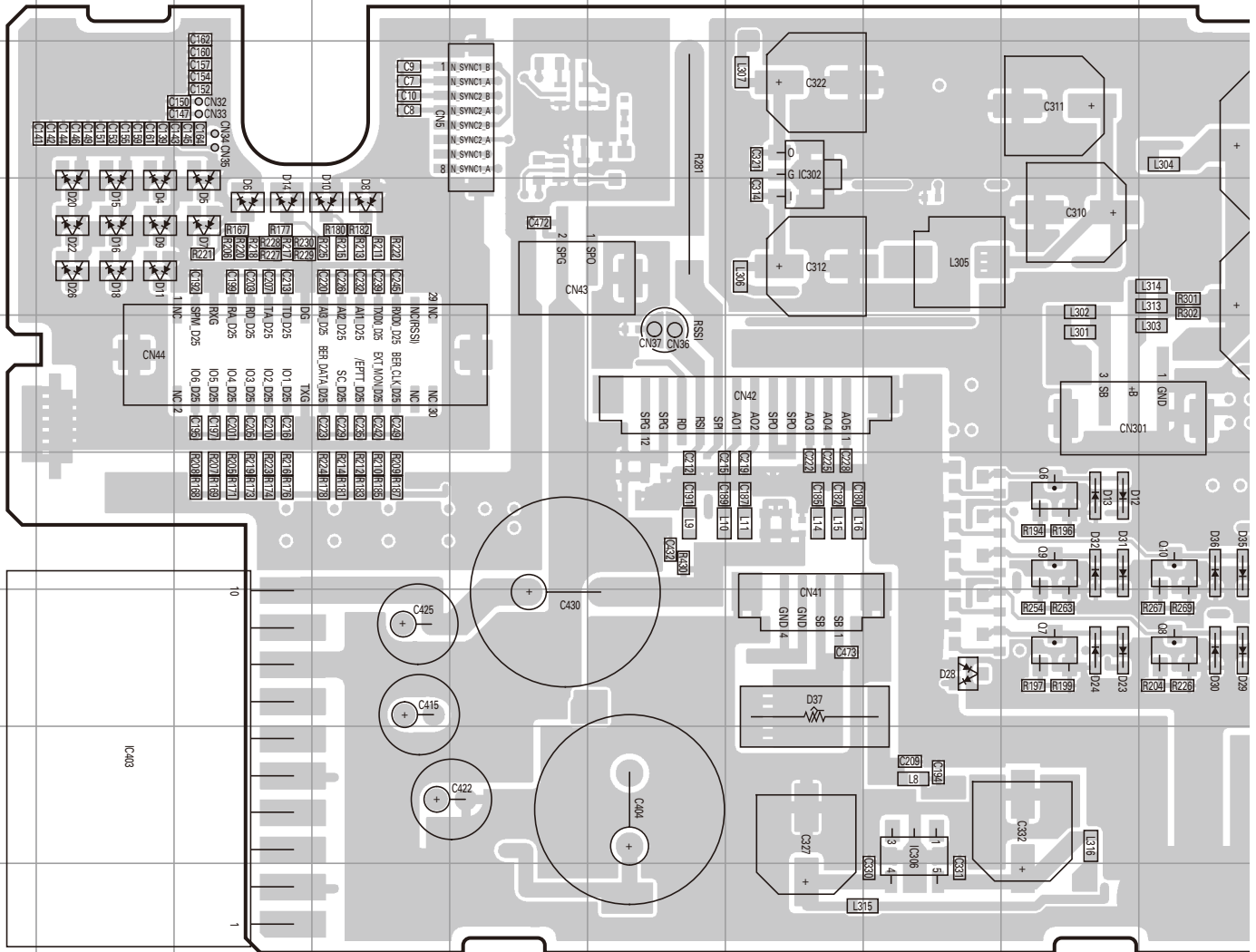
# PC BOARD / PC板 NXR-810

**FINAL UNIT (X45-3932-71)**  
**Foil side view (J79-0264-19)**



# NXR-810 PC BOARD / PC板

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

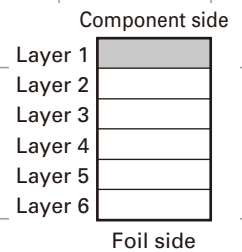
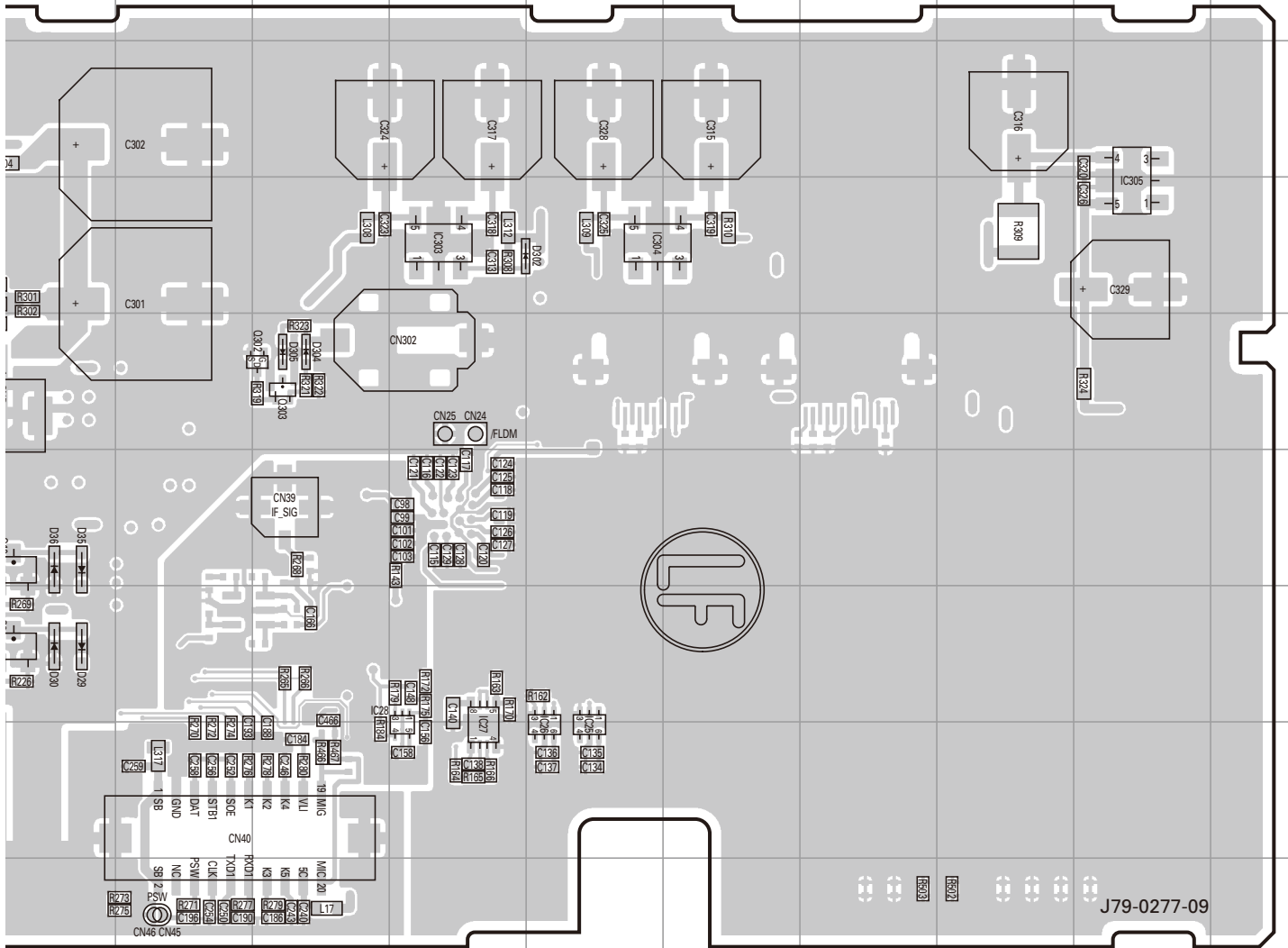


Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC25	8N	Q6	6I	D7	4C	D18	4B	D32	6I
IC26	8N	Q7	7I	D8	4D	D20	4B	D35	6J
IC27	8M	Q8	7J	D9	4B	D22	4B	D36	6J
IC28	8M	Q9	6I	D10	4D	D23	7I	D37	7G
IC302	3G	Q10	6J	D11	4B	D24	7I	D302	4N
IC303	4M	Q302	5L	D12	6I	D26	4B	D304	5L
IC304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



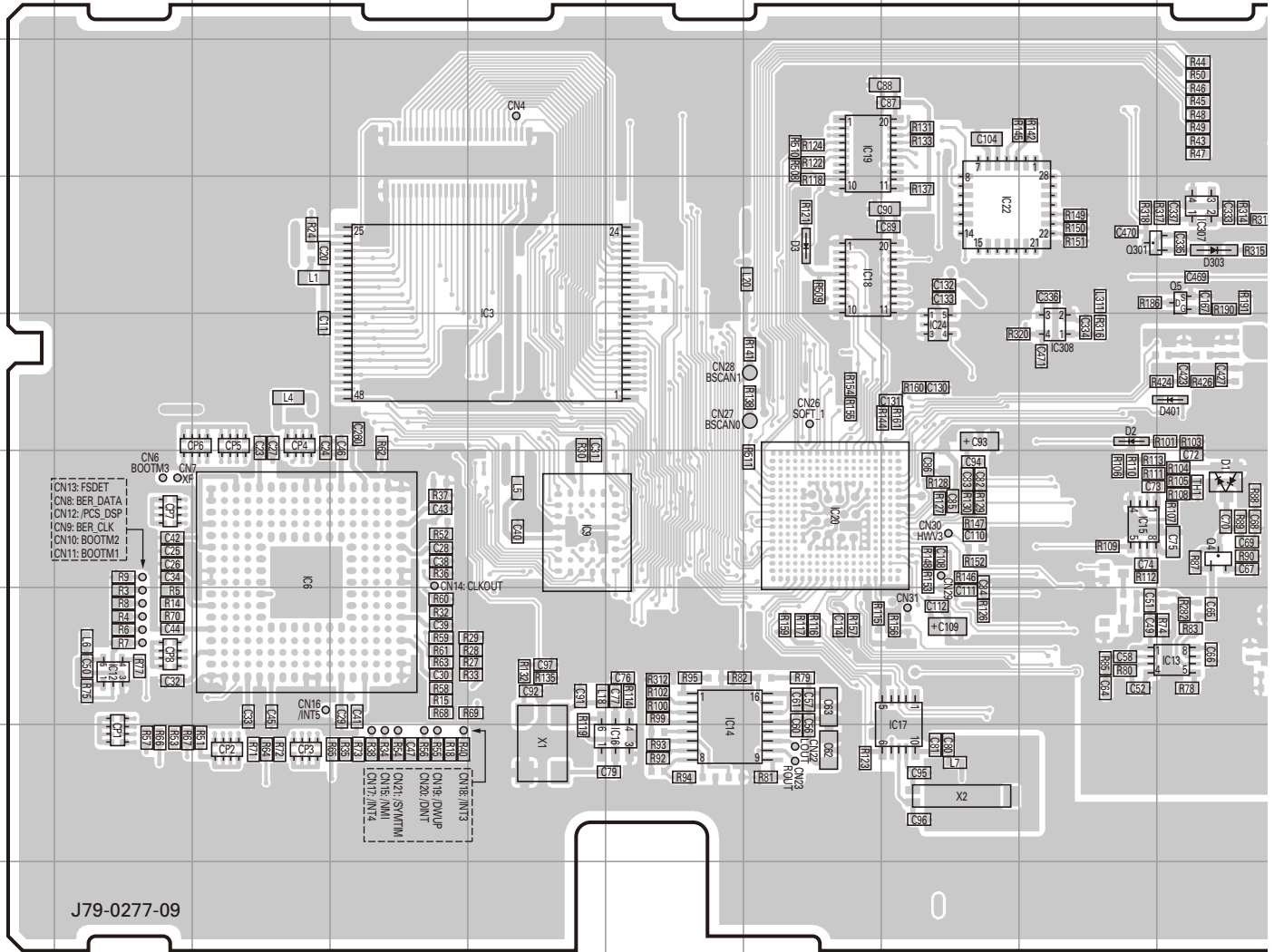
# PC BOARD / PC板 NXR-810

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



# NXR-810 PC BOARD / PC板

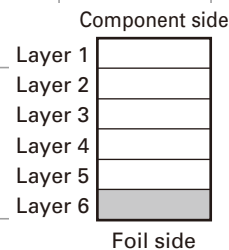
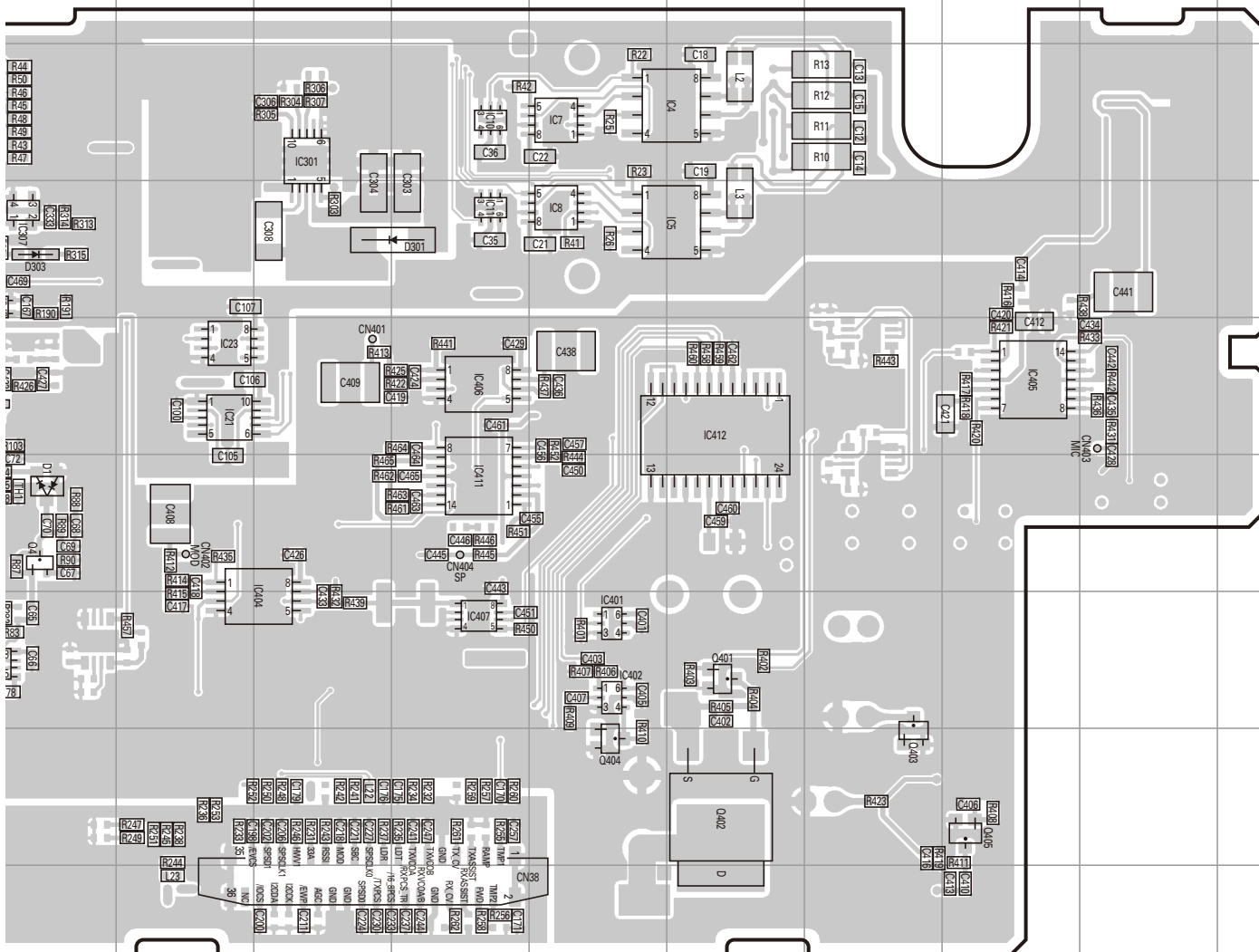
**CONTROL UNIT (X53-4490-10)**  
**Foil side view (J79-0277-09)**



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

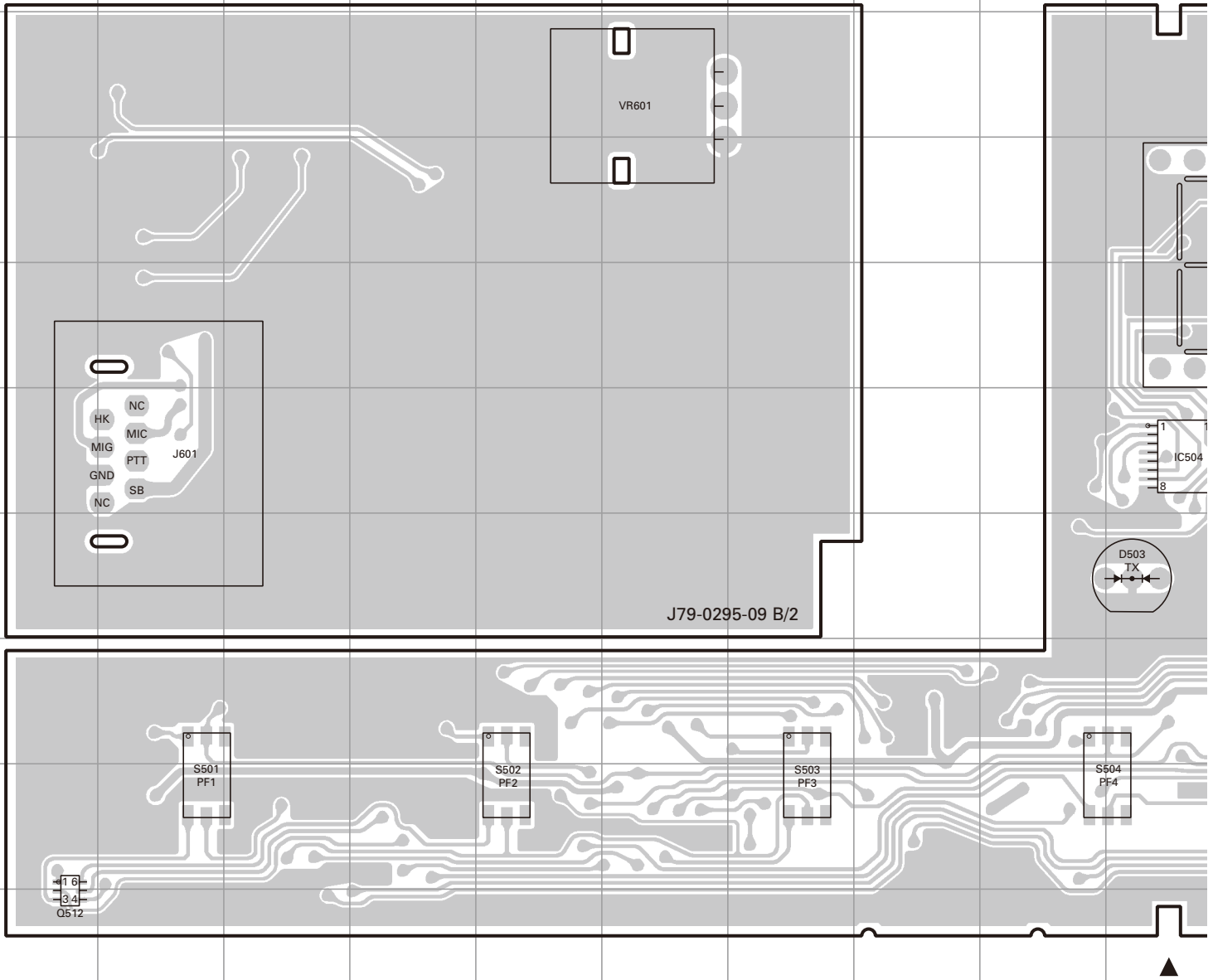
# PC BOARD / PC板 NXR-810

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



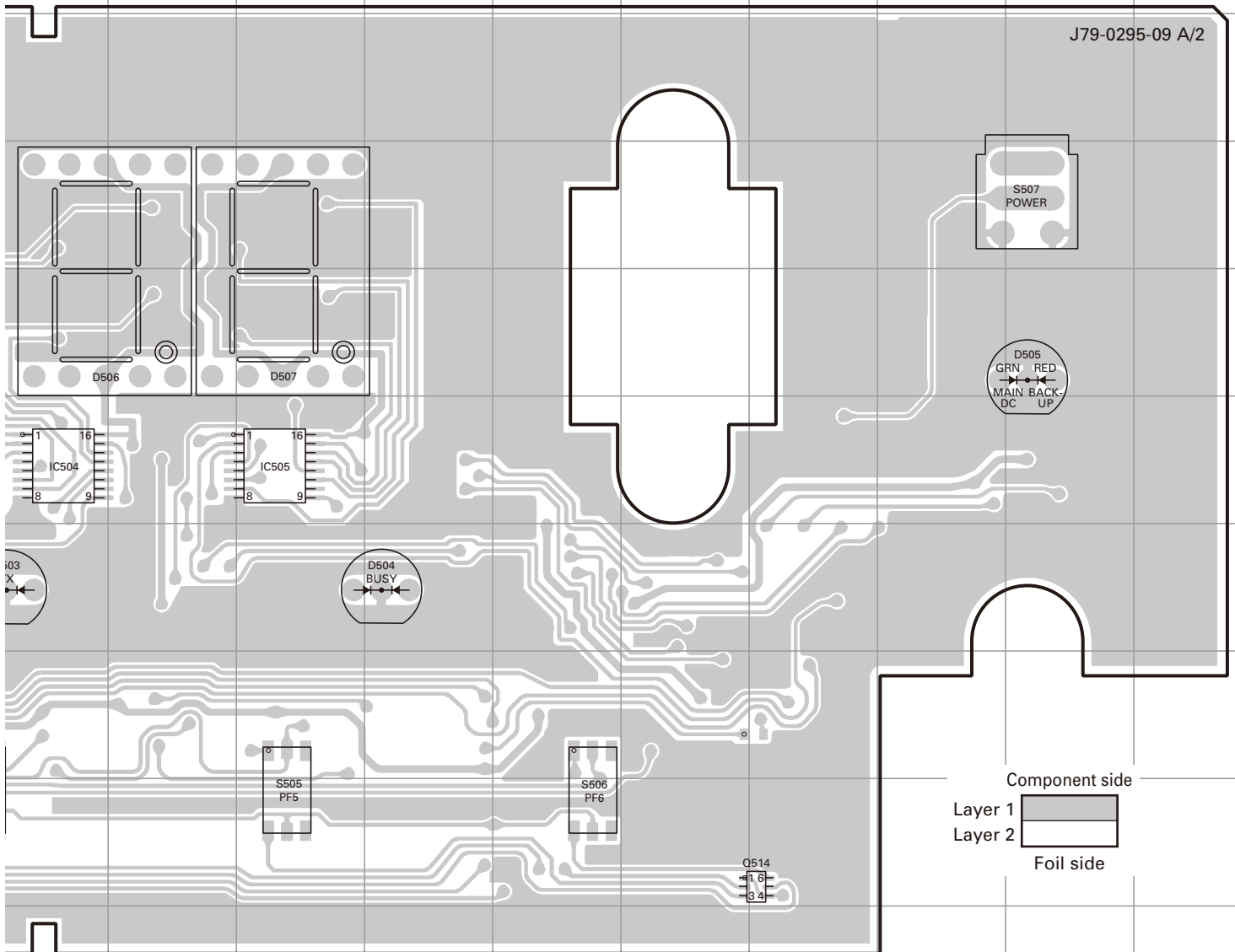
# NXR-810 PC BOARD / PC板

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



# PC BOARD / PC板 NXR-810

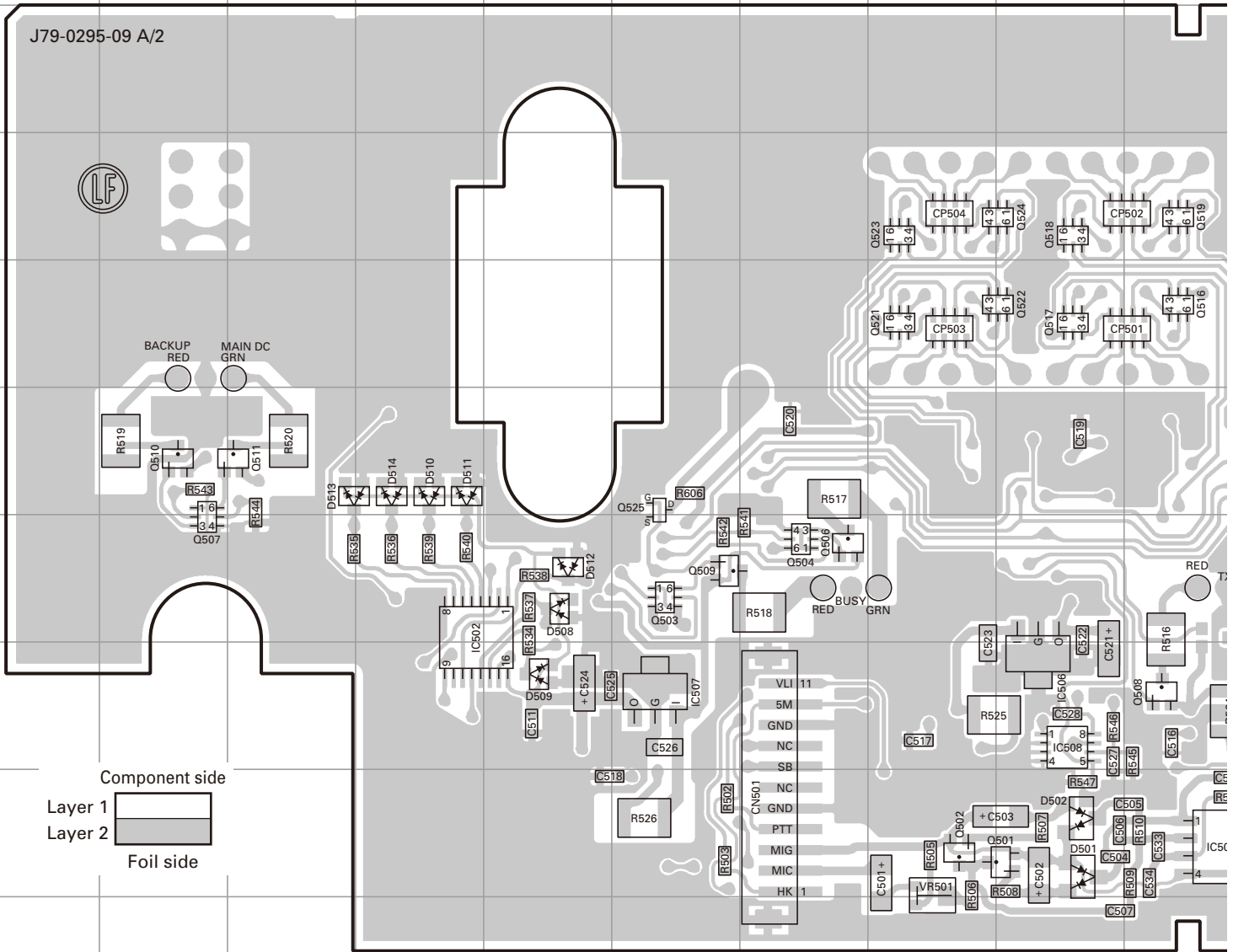
## DISPLAY UNIT (X54-3730-20) Component side view (J79-0295-09)



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

# NXR-810 PC BOARD / PC板

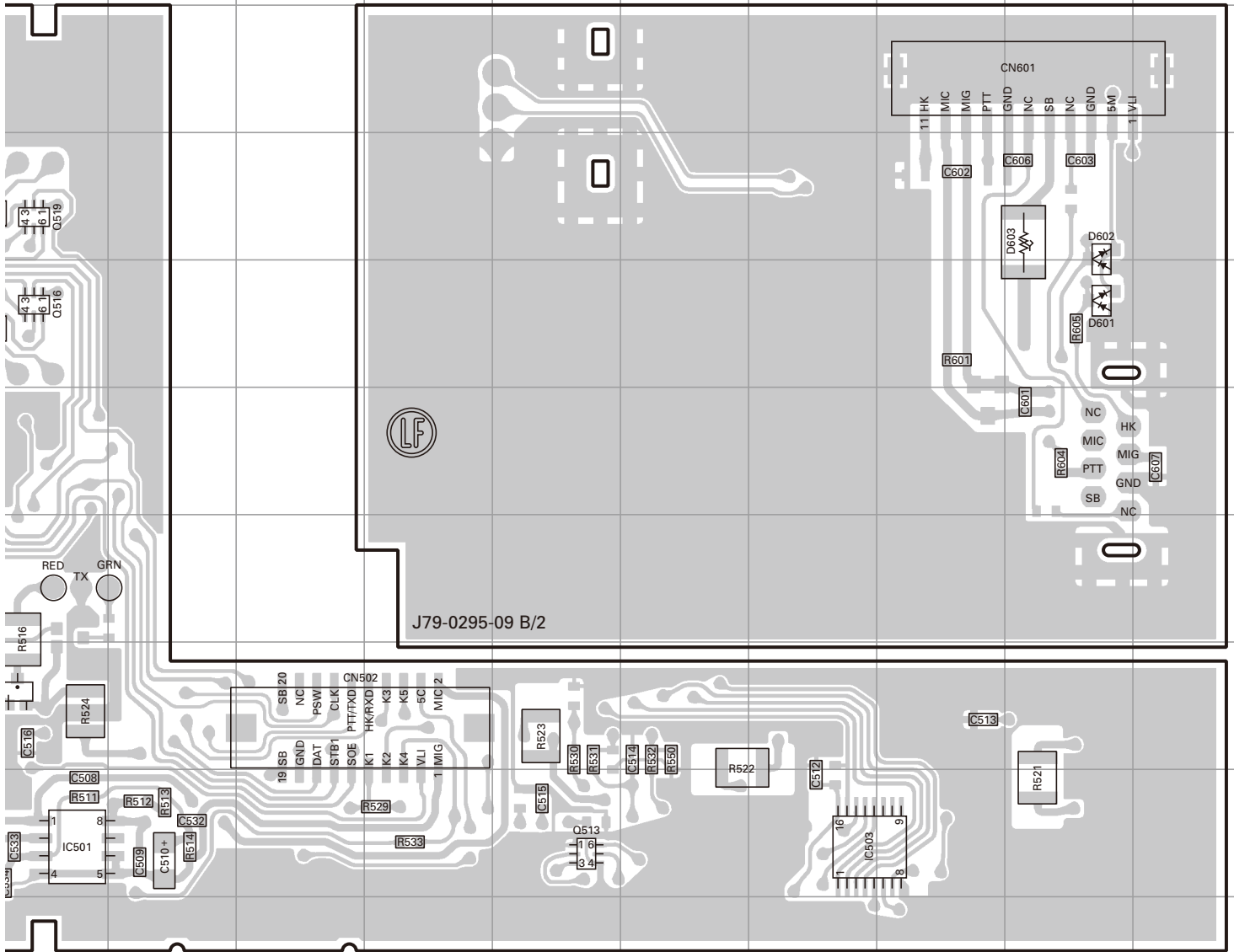
## DISPLAY UNIT (X54-3730-20) Foil side view (J79-0295-09)



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

# PC BOARD / PC板 NXR-810

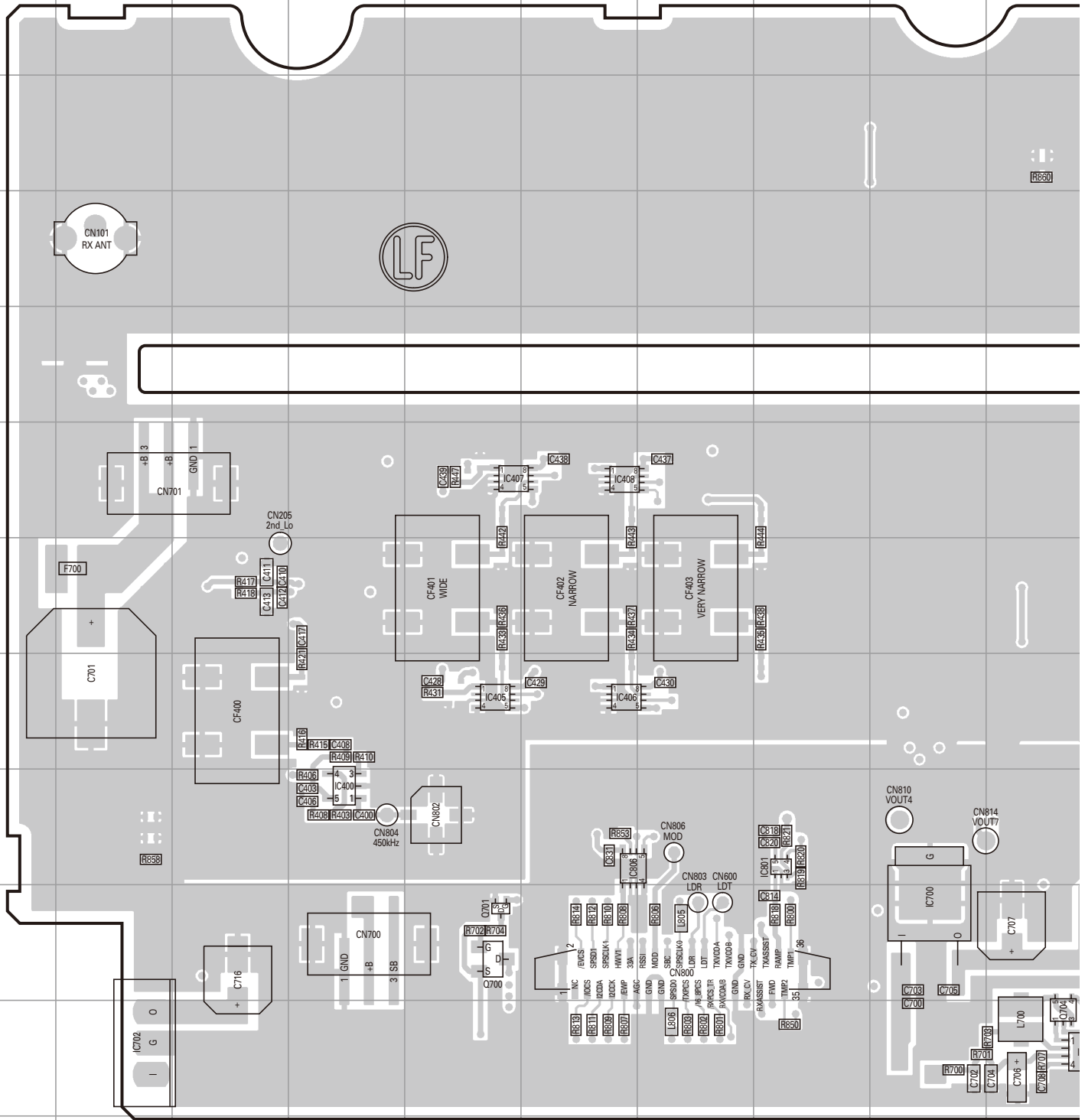
## DISPLAY UNIT (X54-3730-20) Foil side view (J79-0295-09)



# NXR-810 PC BOARD / PC板

TX-RX UNIT (X57-7952-71)

Component side view (J79-0266-09)



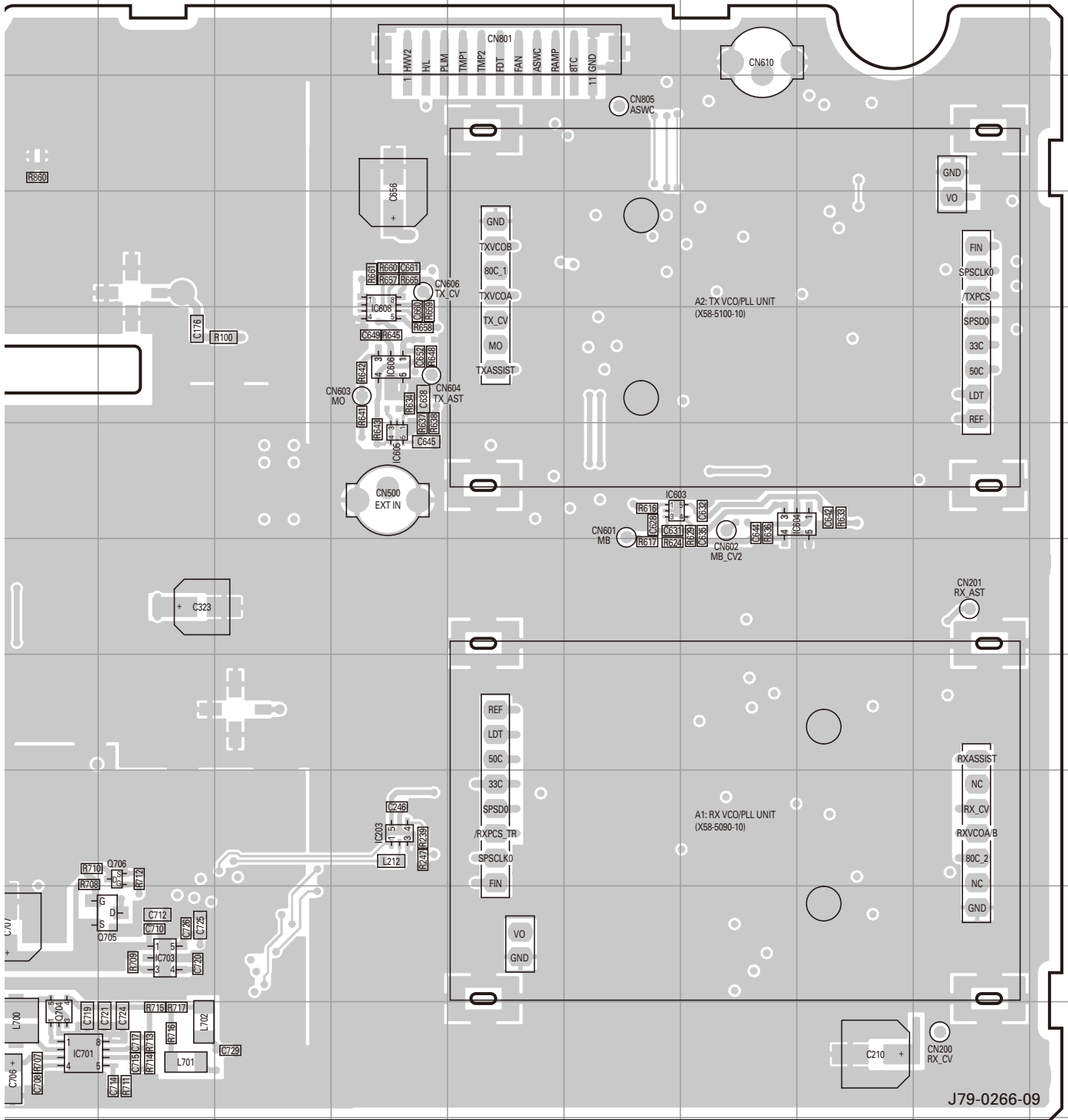
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC203	9M	IC603	6O	IC701	11J	Q701	10E
IC400	9D	IC604	6P	IC702	11B	Q704	11J
IC405	8E	IC605	6M	IC703	10K	Q705	10K
IC406	8F	IC606	5M	IC801	9H	Q706	9K
IC407	6E	IC608	5M	IC806	9F		
IC408	6F	IC700	10I	Q700	10E		



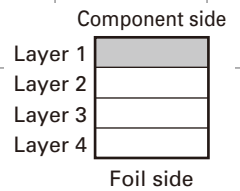
# PC BOARD / PC板 NXR-810

## TX-RX UNIT (X57-7952-71)

### Component side view (J79-0266-09)

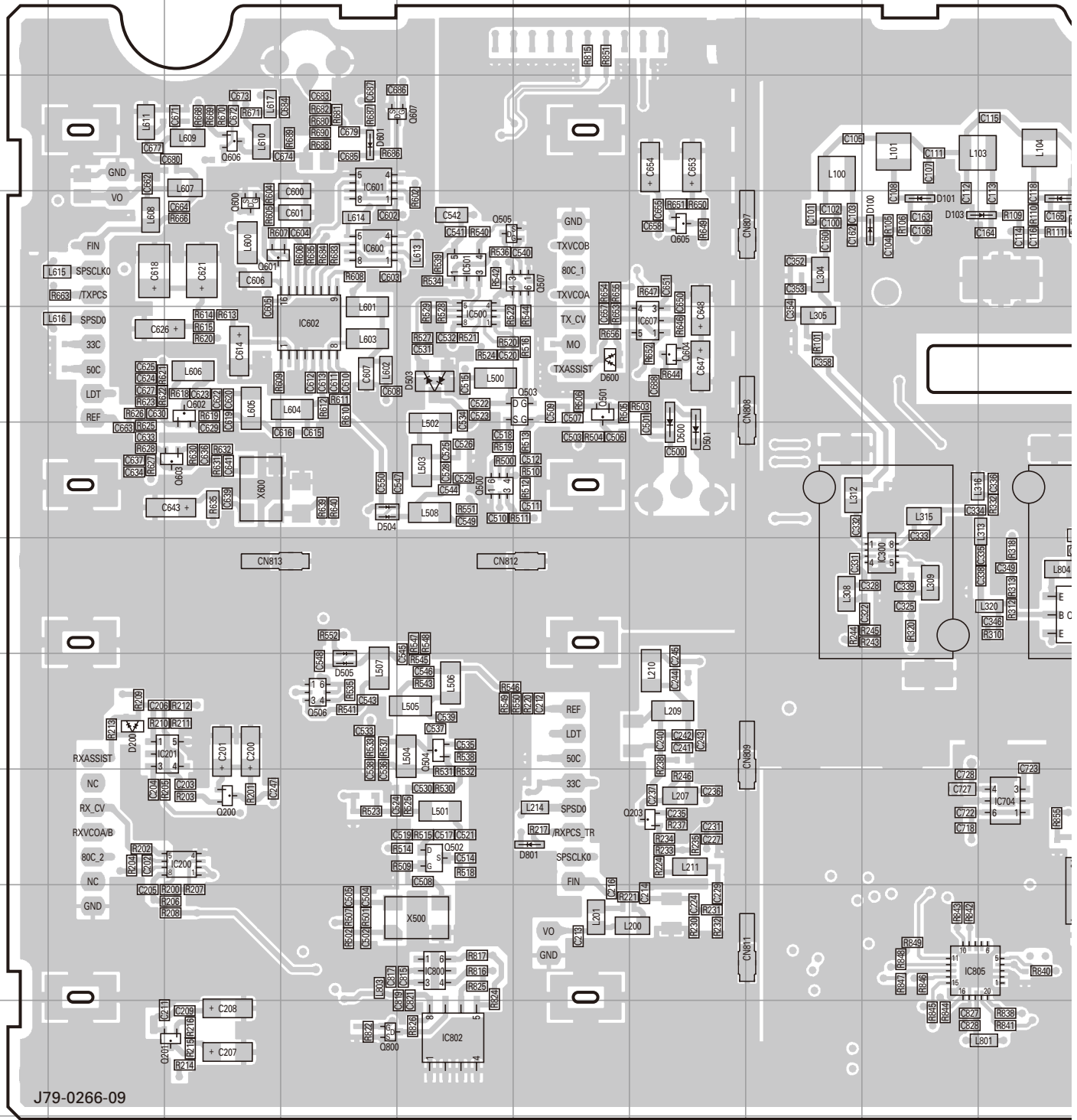


J79-0266-09



# NXR-810 PC BOARD / PC板

TX-RX UNIT (X57-7952-71)  
Foil side view (J79-0266-09)

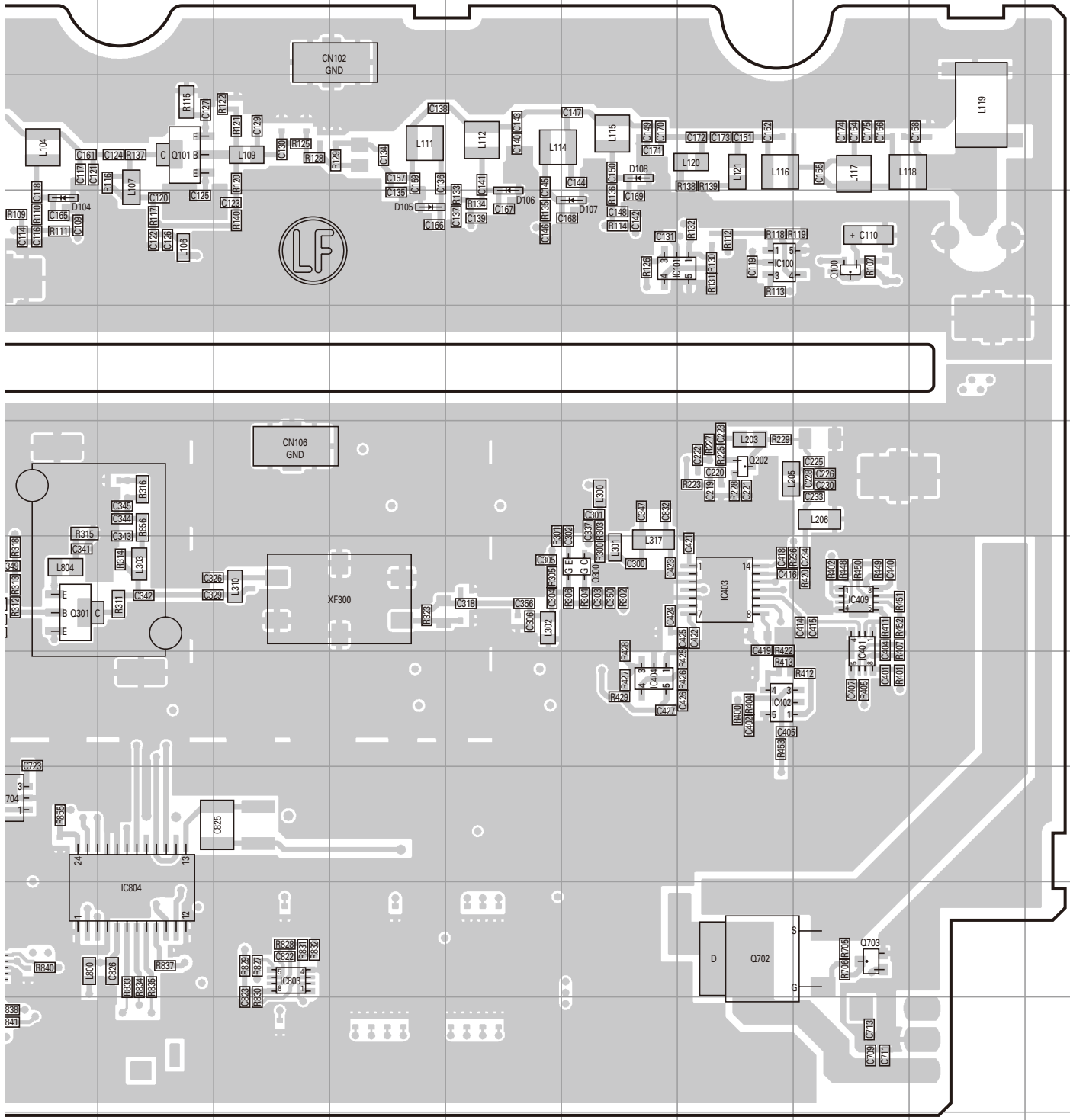


J79-0266-09

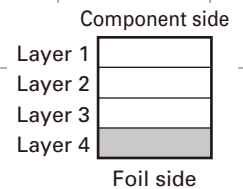
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC100	4P	IC402	8P	IC600	4D	IC802	11E	Q200	9C	Q500	6E	Q506	8D	Q604	
IC101	4O	IC403	7P	IC601	3D	IC803	10L	Q201	11C	Q501	5F	Q507	4F	Q605	
IC200	9C	IC404	8O	IC602	5D	IC804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

# PC BOARD / PC板 NXR-810

TX-RX UNIT (X57-7952-71)  
Foil side view (J79-0266-09)



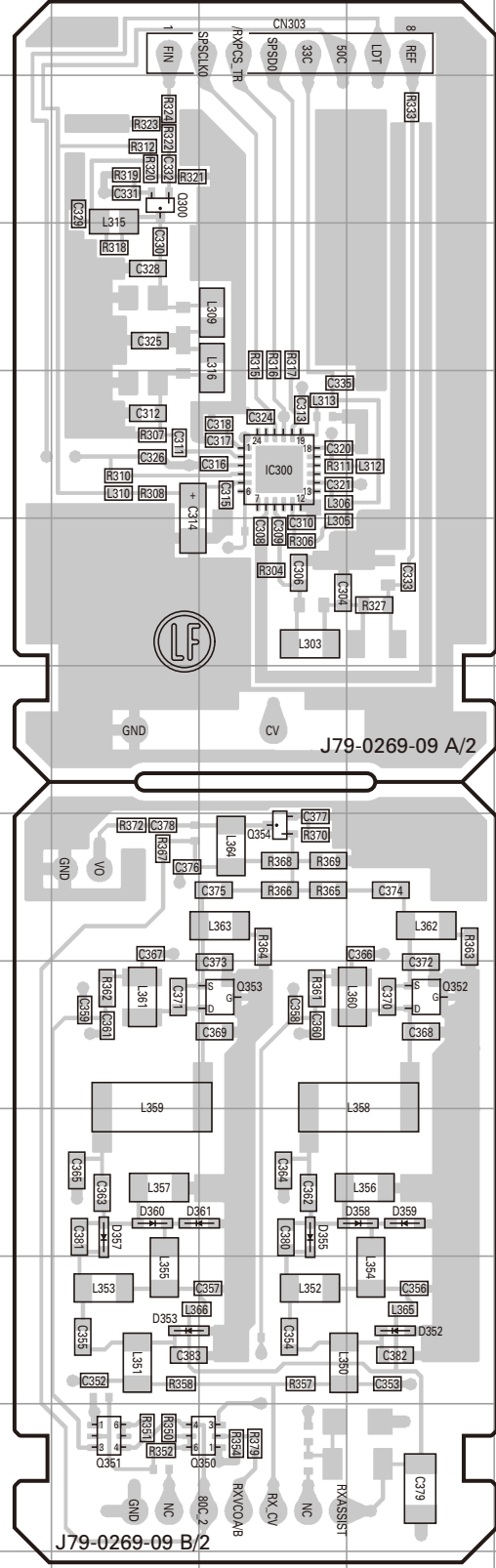
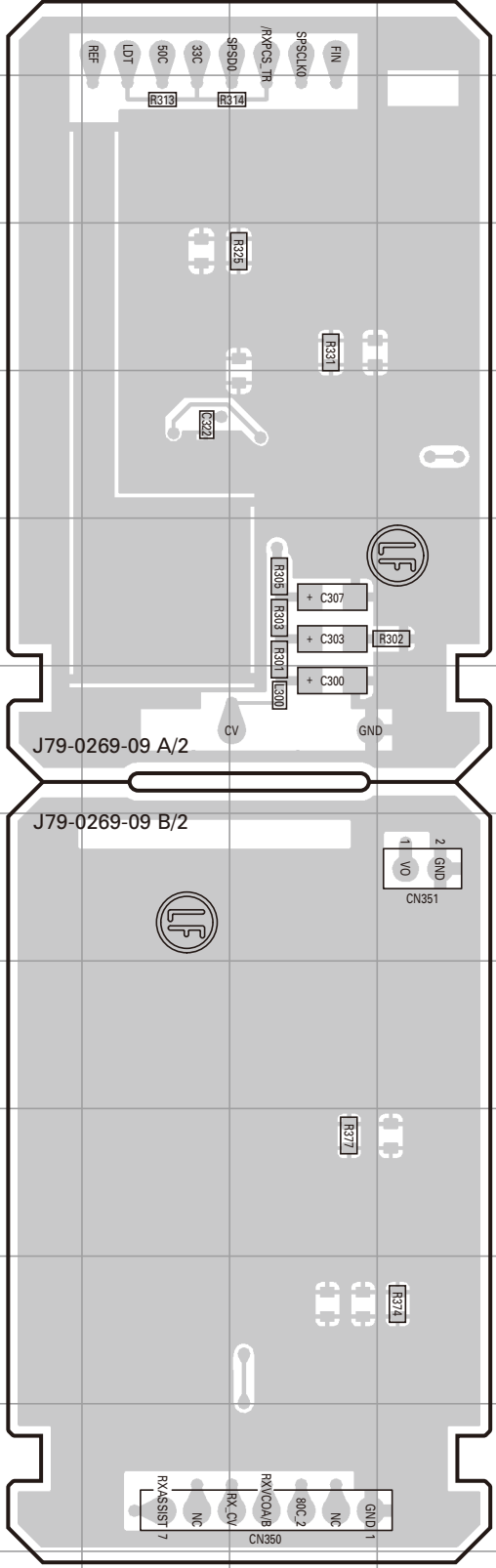
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
Q604	5G	Q800	11D	D106	4N	D503	5E
Q605	4G	D100	4I	D107	4O	D504	6D
Q606	3C	D101	4I	D108	3O	D505	8D
Q607	3E	D103	4I	D200	8B	D600	5F
Q702	10P	D104	4J	D500	6G	D601	3D
Q703	10Q	D105	4M	D501	6G	D801	9F



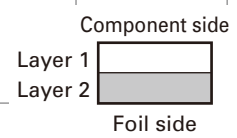
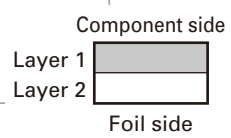
# NXR-810 PC BOARD / PC板

**RX VCO/PLL UNIT (X58-5090-10)**  
**Component side view (J79-0269-09)**

**RX VCO/PLL UNIT (X58-5090-10)**  
**Foil side view (J79-0269-09)**



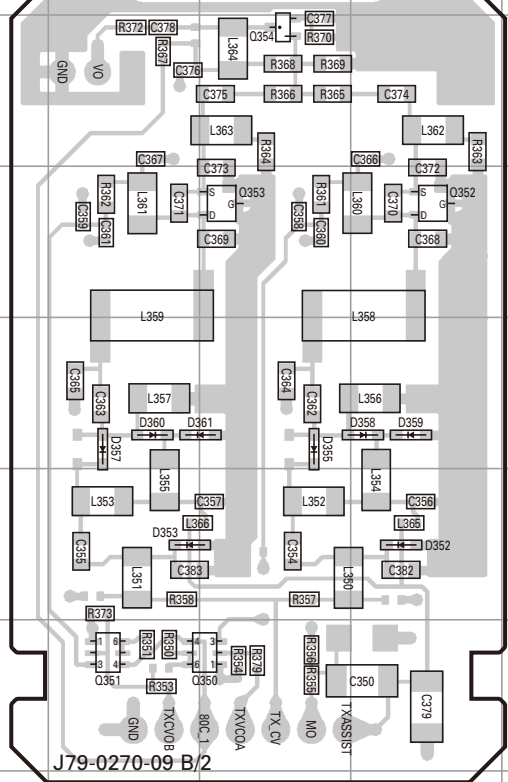
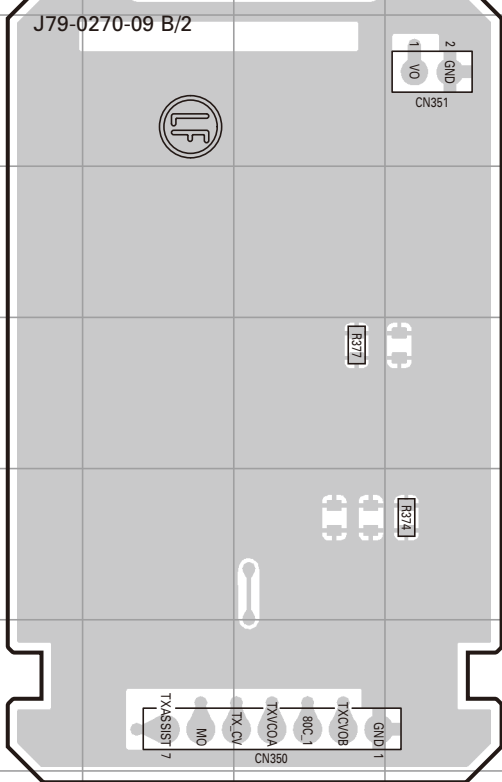
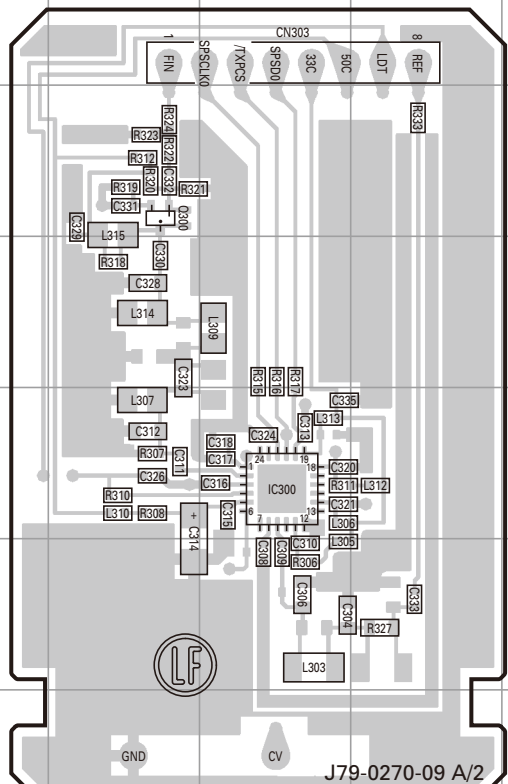
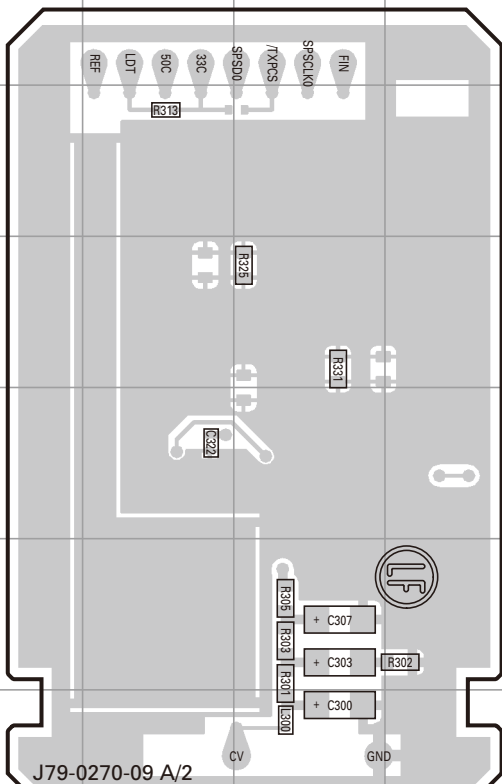
Ref. No.	Address
IC300	5G
Q300	3F
Q350	12G
Q351	12F
Q352	9H
Q353	9G
Q354	8G
D352	11H
D353	11F
D355	10G
D357	10F
D358	10H
D359	10H
D360	10F
D361	10G



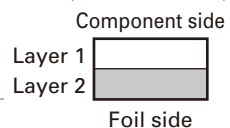
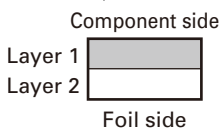
# PC BOARD / PC板 NXR-810

**TX VCO/PLL UNIT (X58-5100-10)**  
**Component side view (J79-0270-09)**

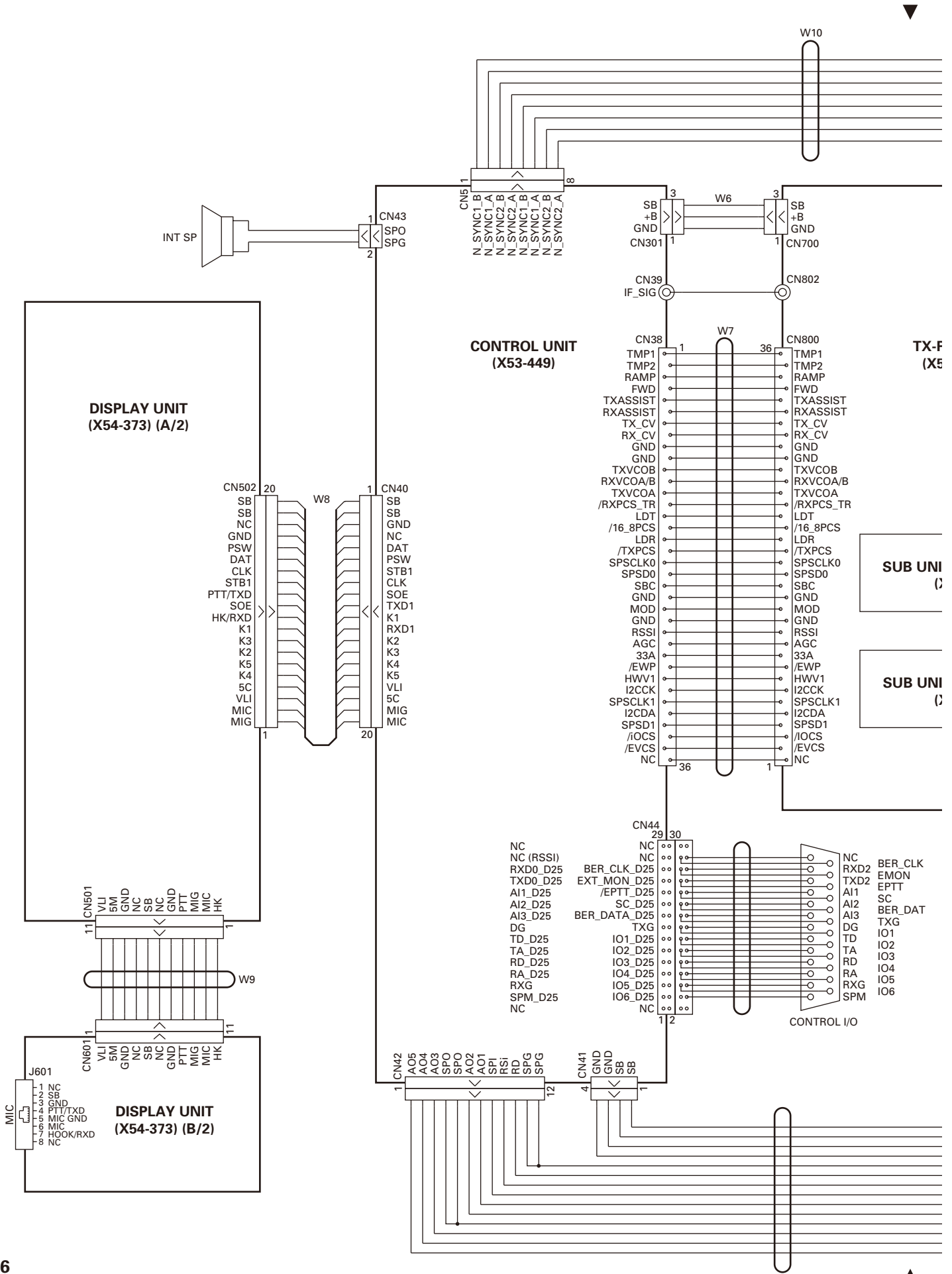
**TX VCO/PLL UNIT (X58-5100-10)**  
**Foil side view (J79-0270-09)**



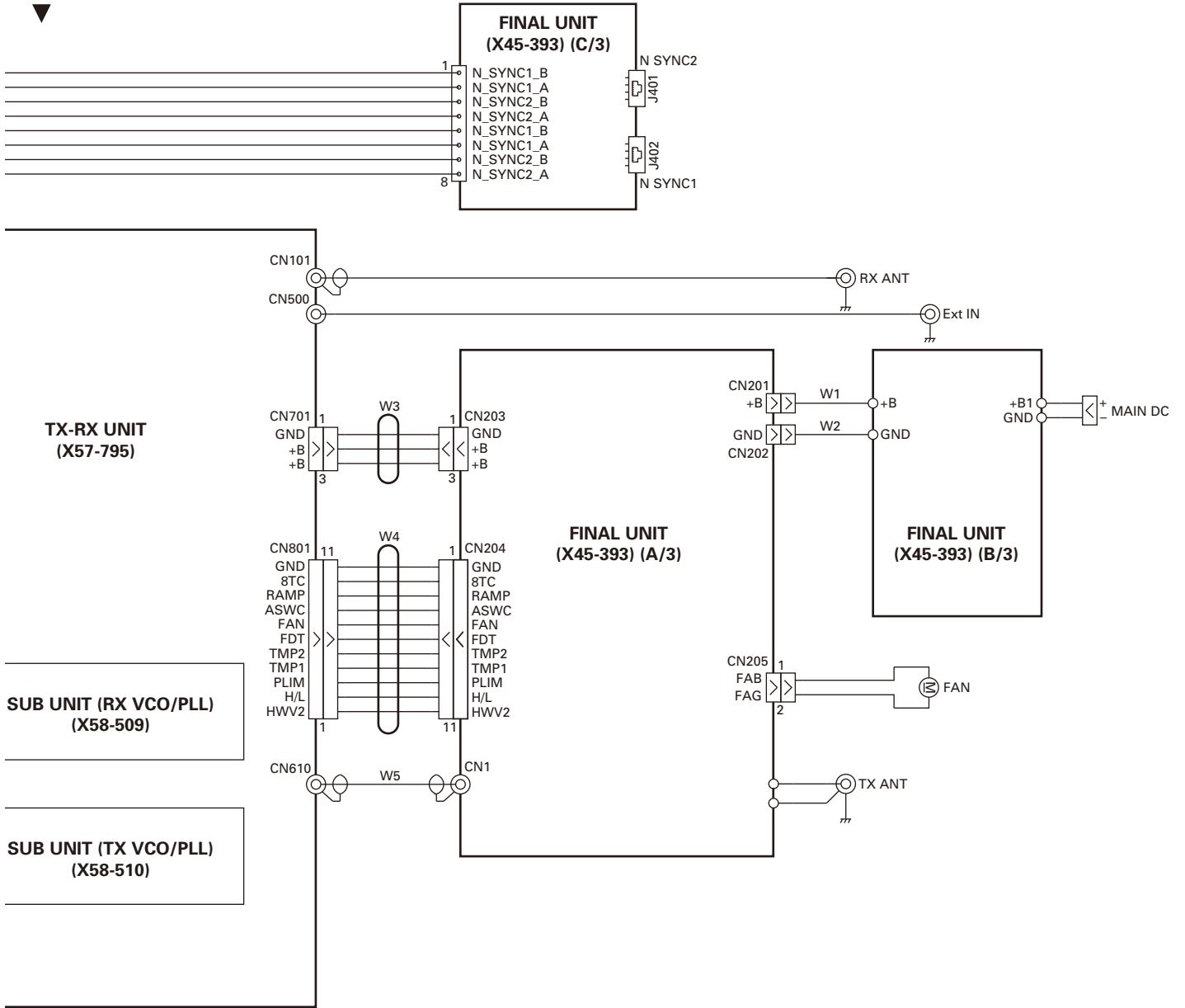
Ref. No.	Address
IC300	5G
Q300	3F
Q350	12G
Q351	12F
Q352	9H
Q353	9G
Q354	8G
D352	11H
D353	11F
D355	10G
D357	10F
D358	10H
D359	10H
D360	10F
D361	10G



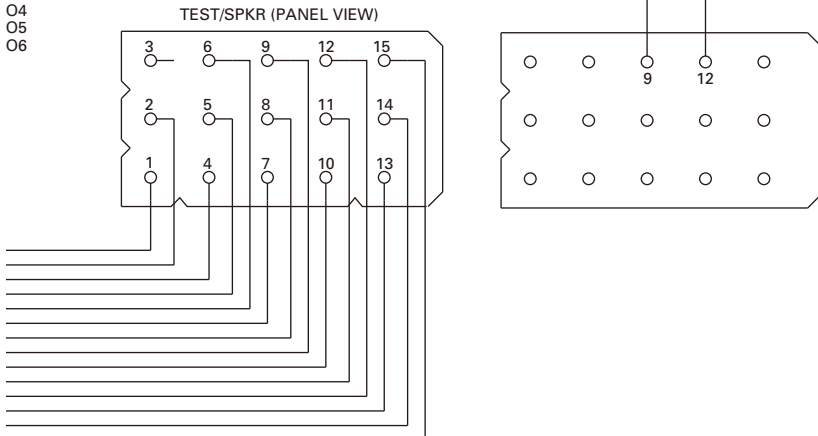
# NXR-810 INTERCONNECTION DIAGRAM / 互连图



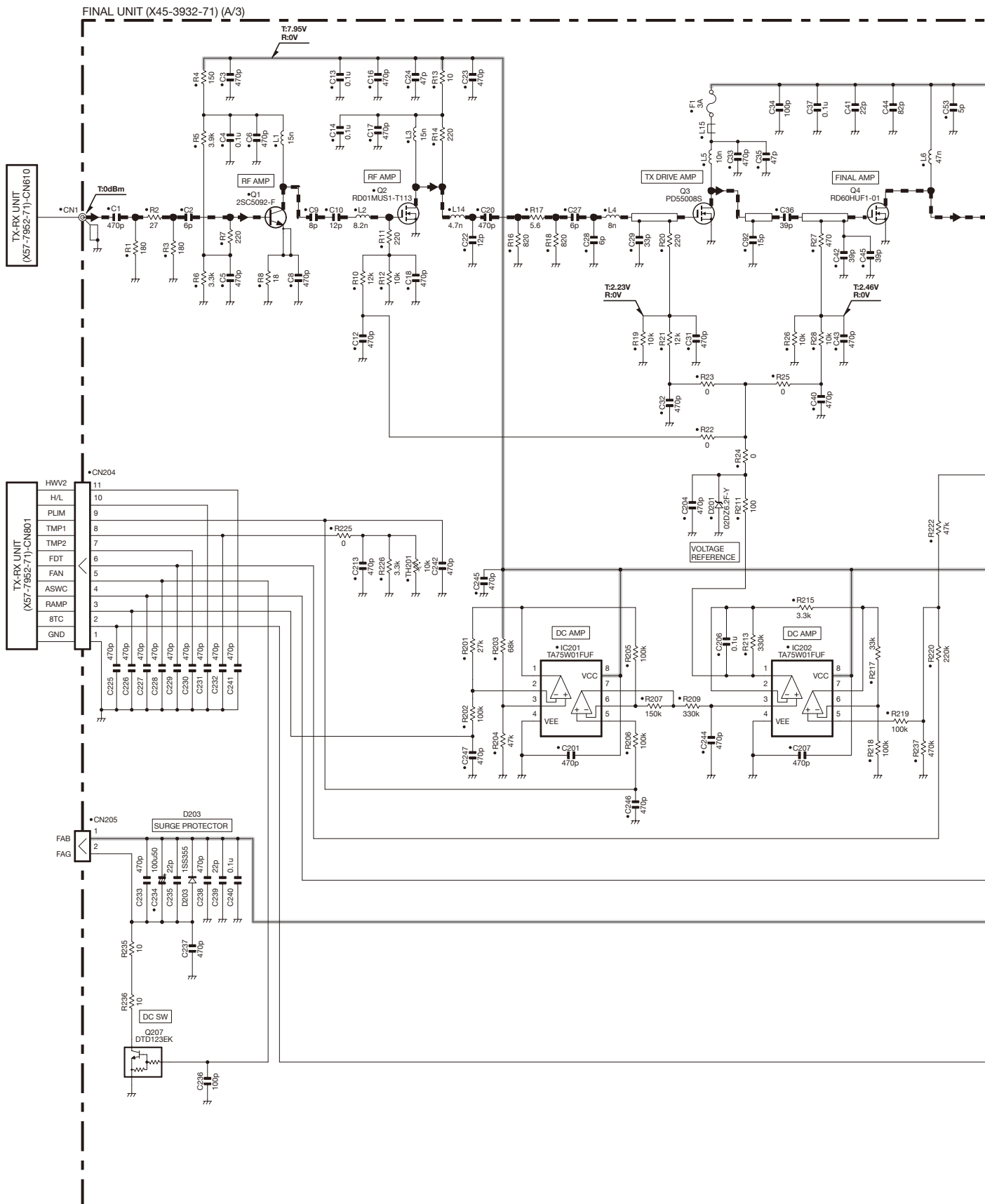
# INTERCONNECTION DIAGRAM / 互连图 NXR-810



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



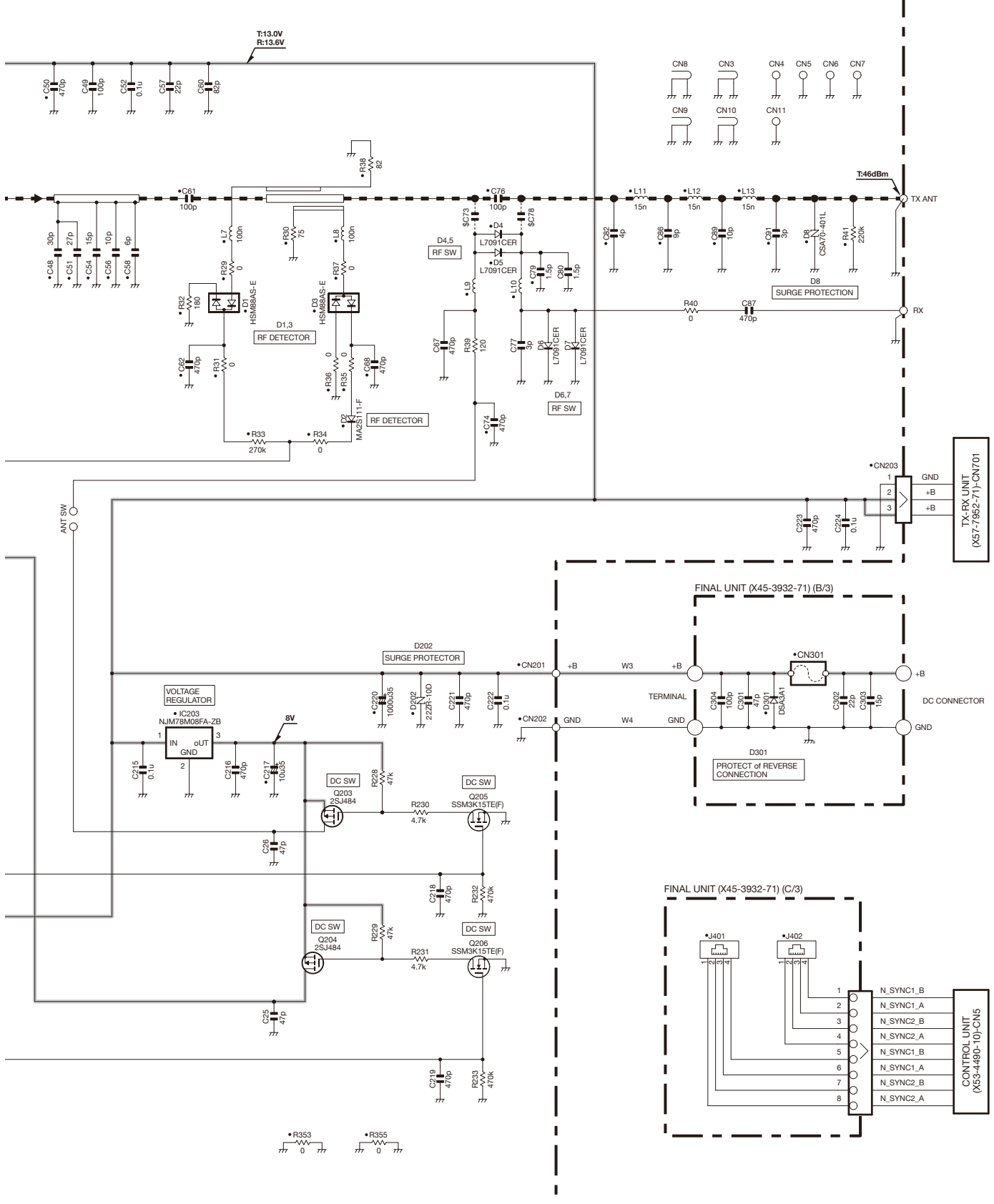
# NXR-810 SCHEMATIC DIAGRAM / 原理图





# SCHEMATIC DIAGRAM / 原理图 NXR-810

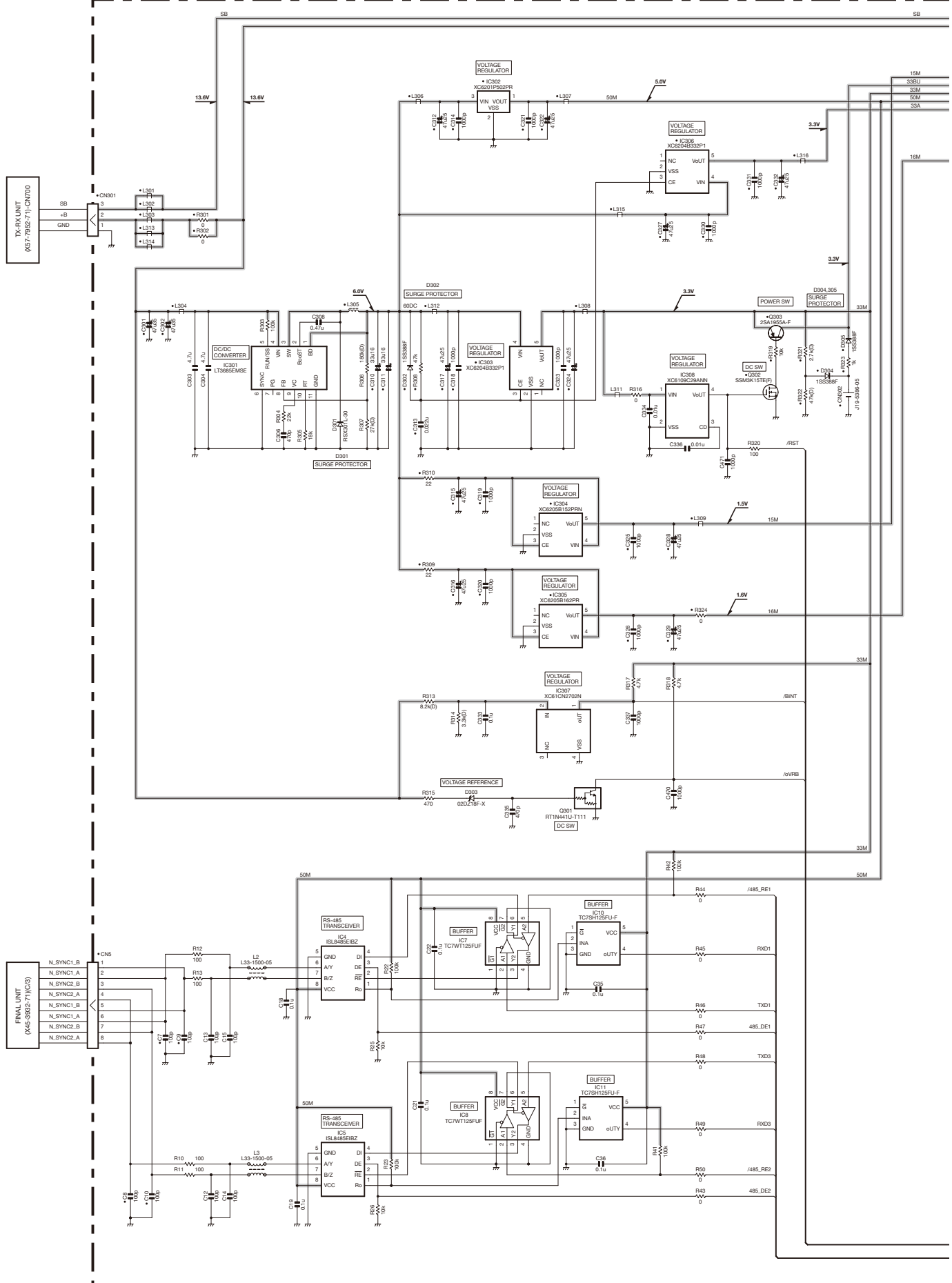
FINAL UNIT (X45-3932-71) (A/3)



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

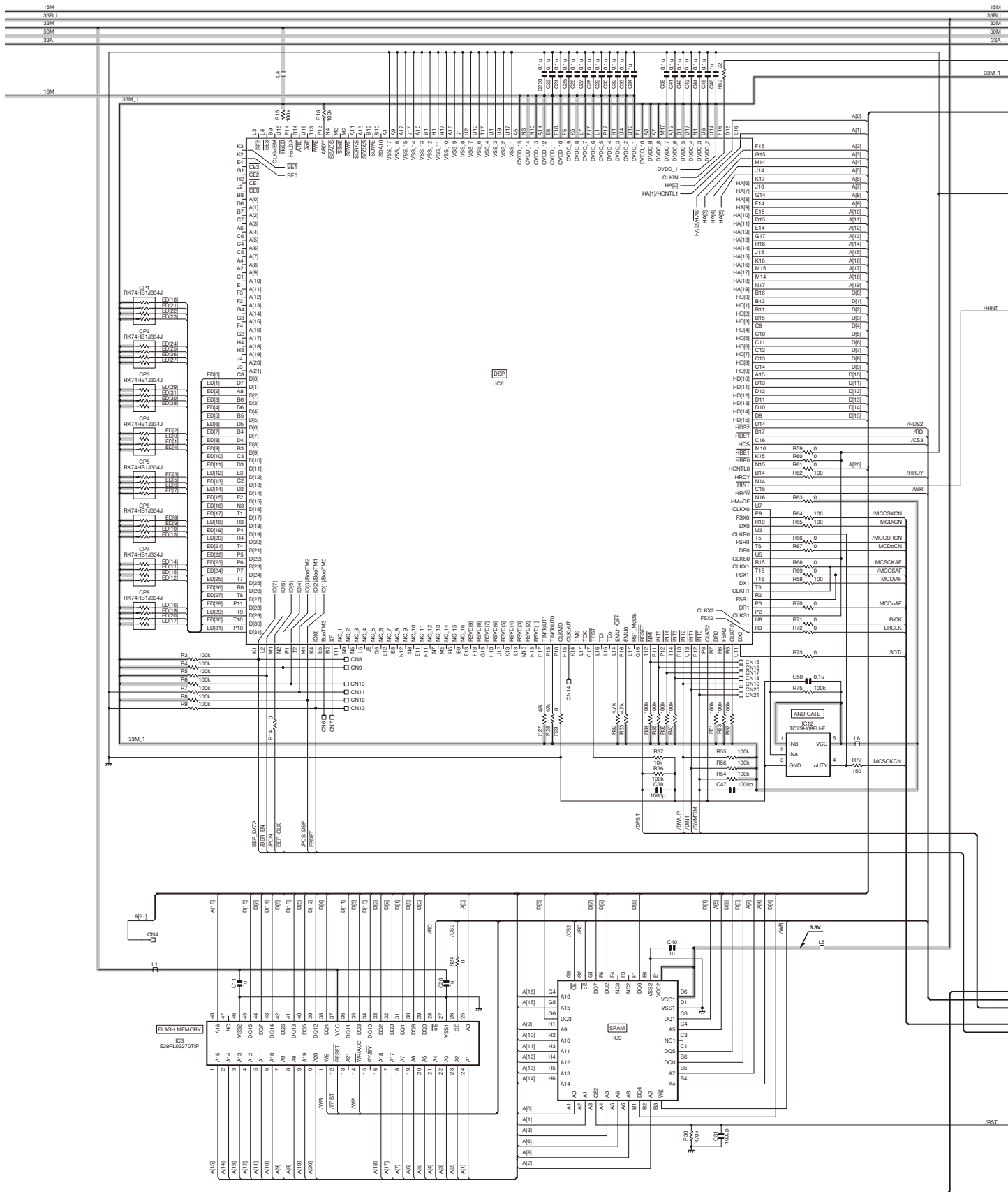
# NXR-810 SCHEMATIC DIAGRAM / 原理图

CONTROL UNIT (X53-4490-10)



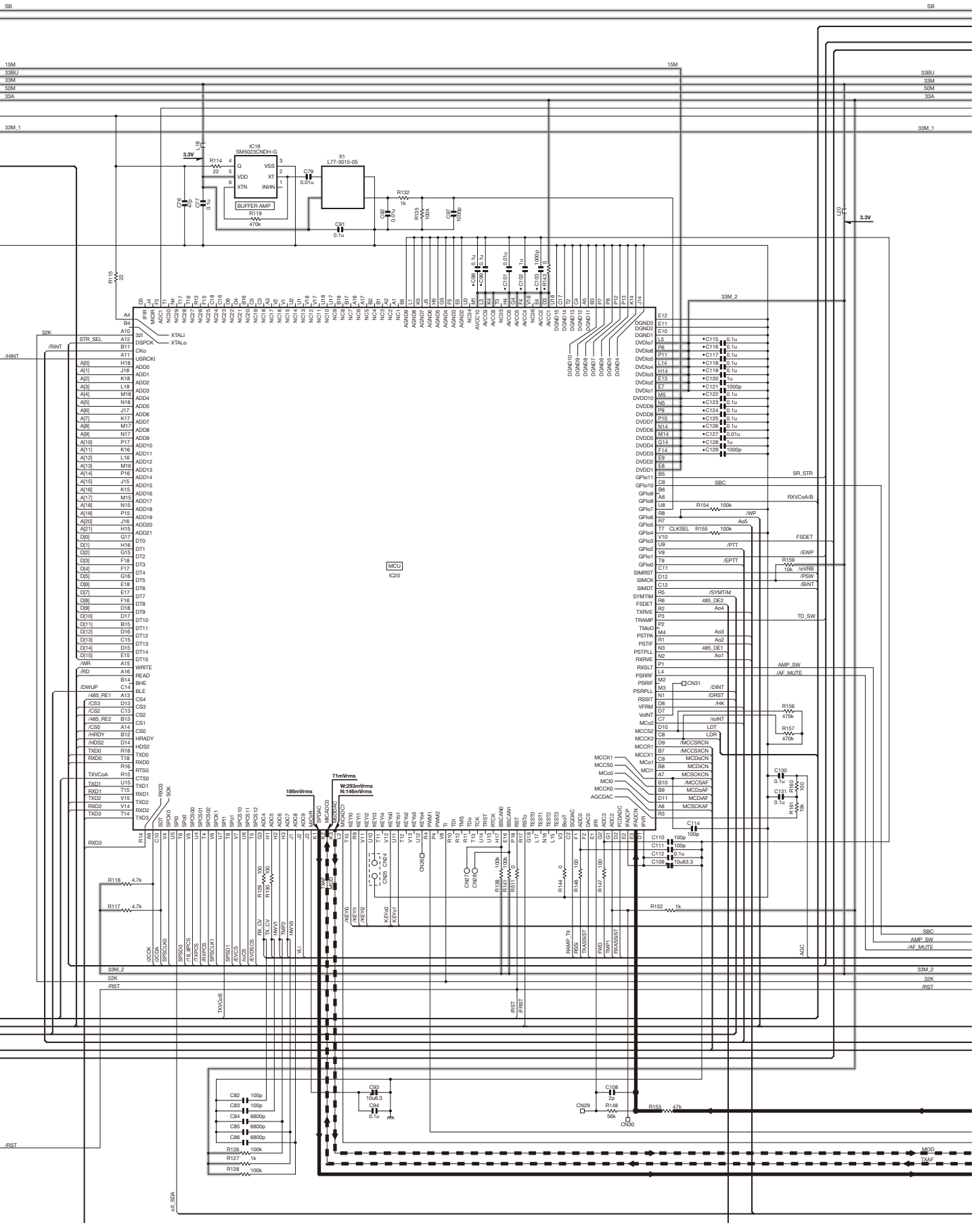
# SCHEMATIC DIAGRAM / 原理图 NXR-810

CONTROL UNIT (X53-4490-10)



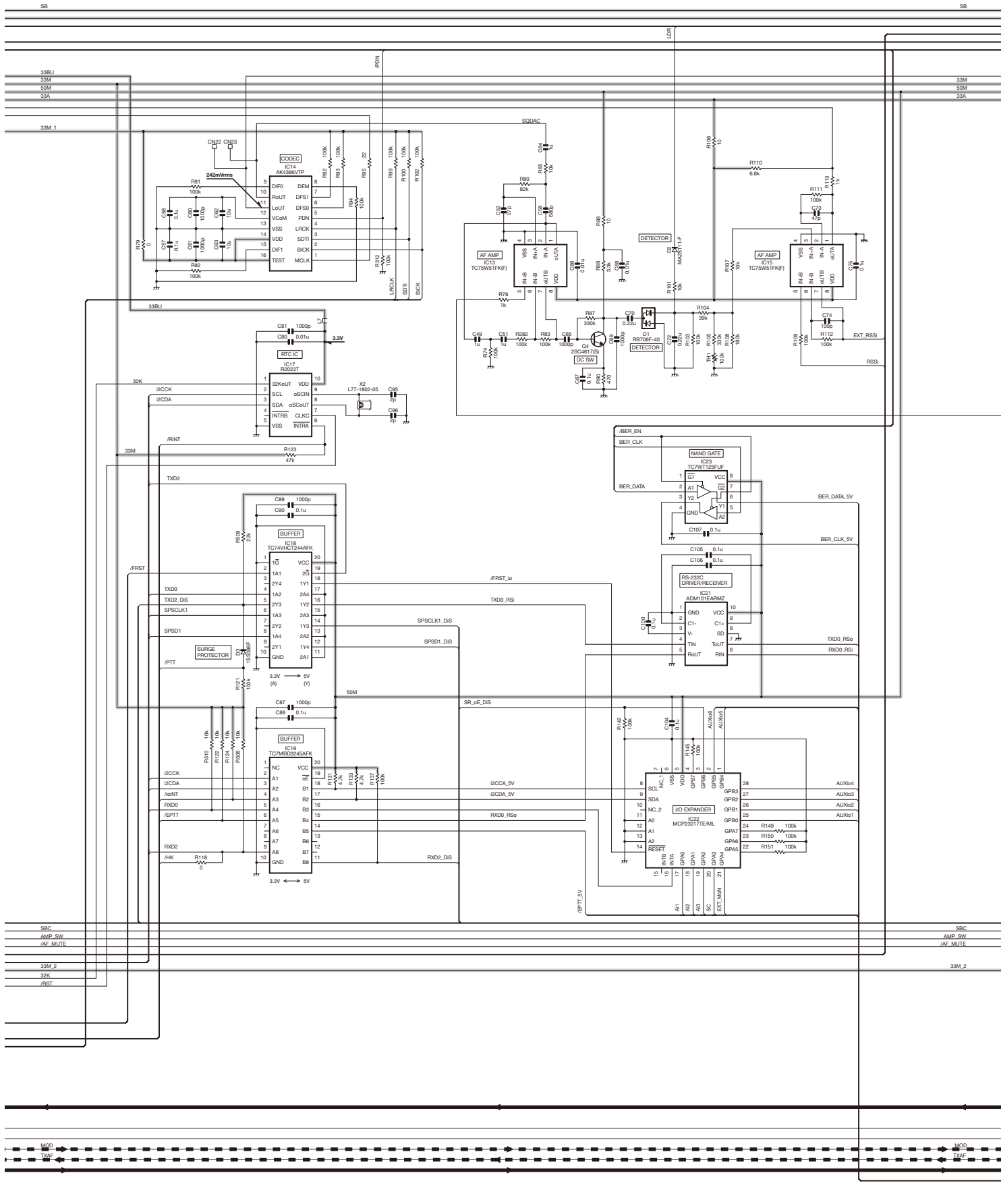
# NXR-810 SCHEMATIC DIAGRAM / 原理图

CONTROL UNIT (X53-4490-10)



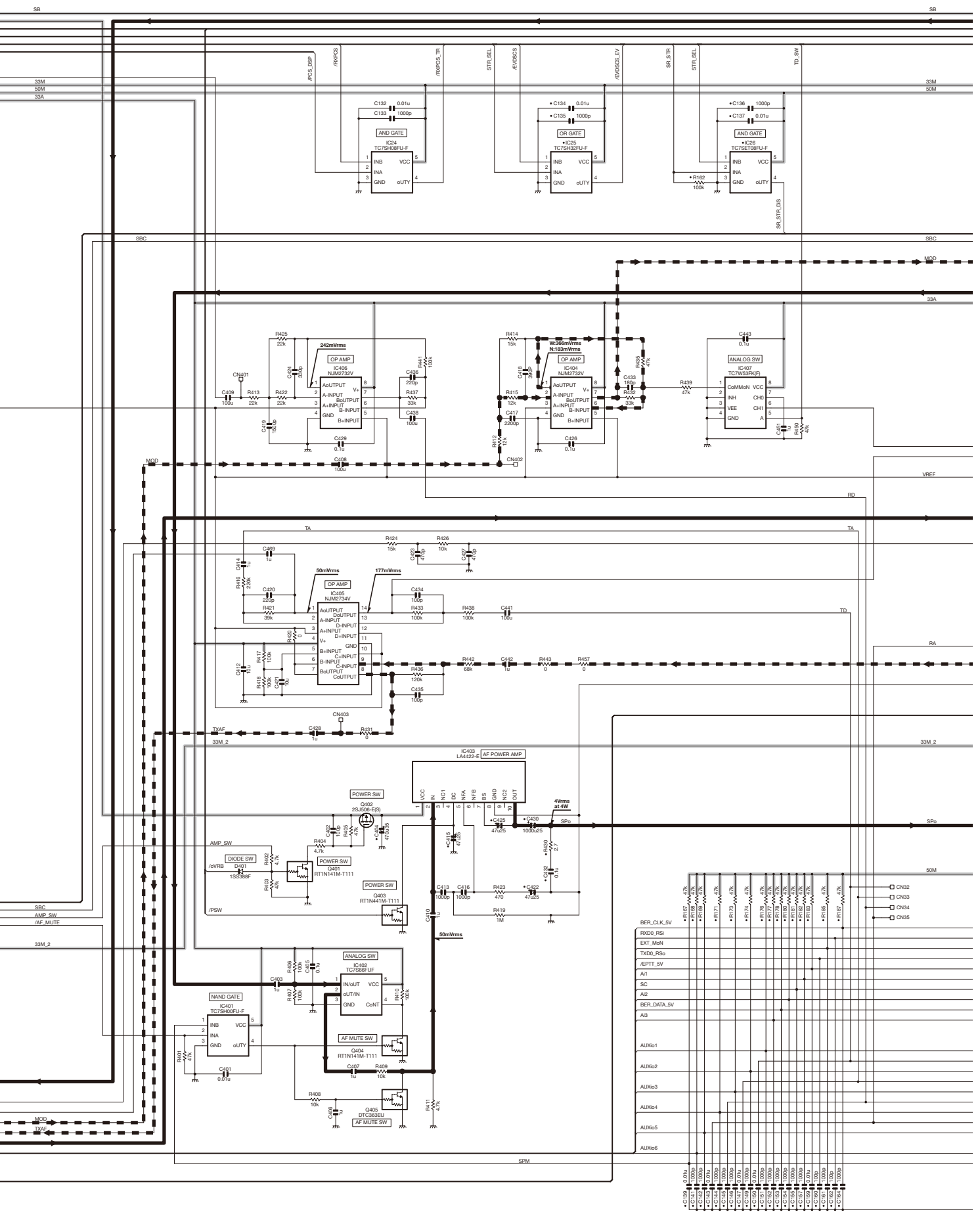
# SCHEMATIC DIAGRAM / 原理图 NXR-810

CONTROL UNIT (X53-4490-10)



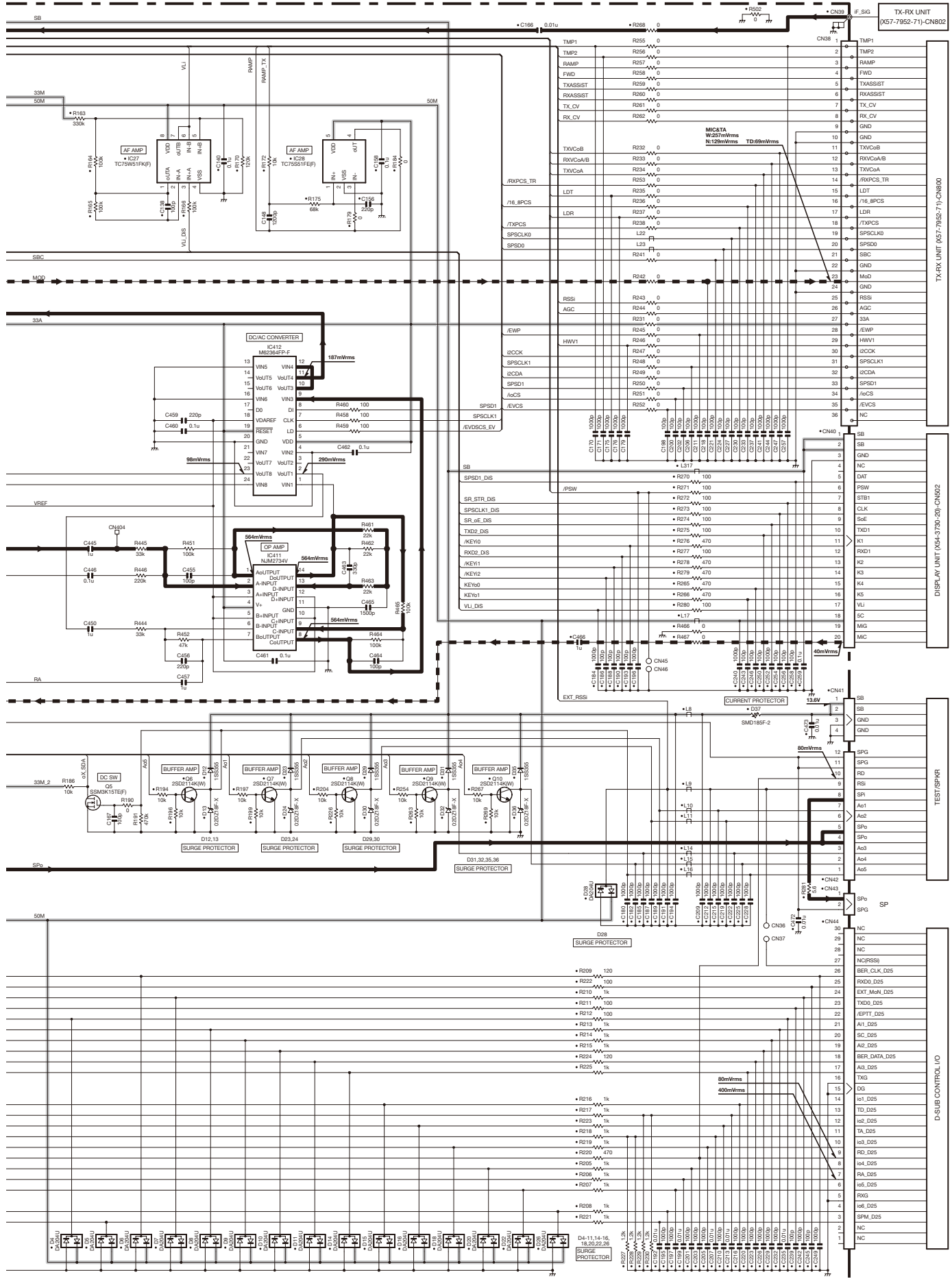
# NXR-810 SCHEMATIC DIAGRAM / 原理图

CONTROL UNIT (X53-4490-10)



# SCHEMATIC DIAGRAM / 原理图 NXR-810

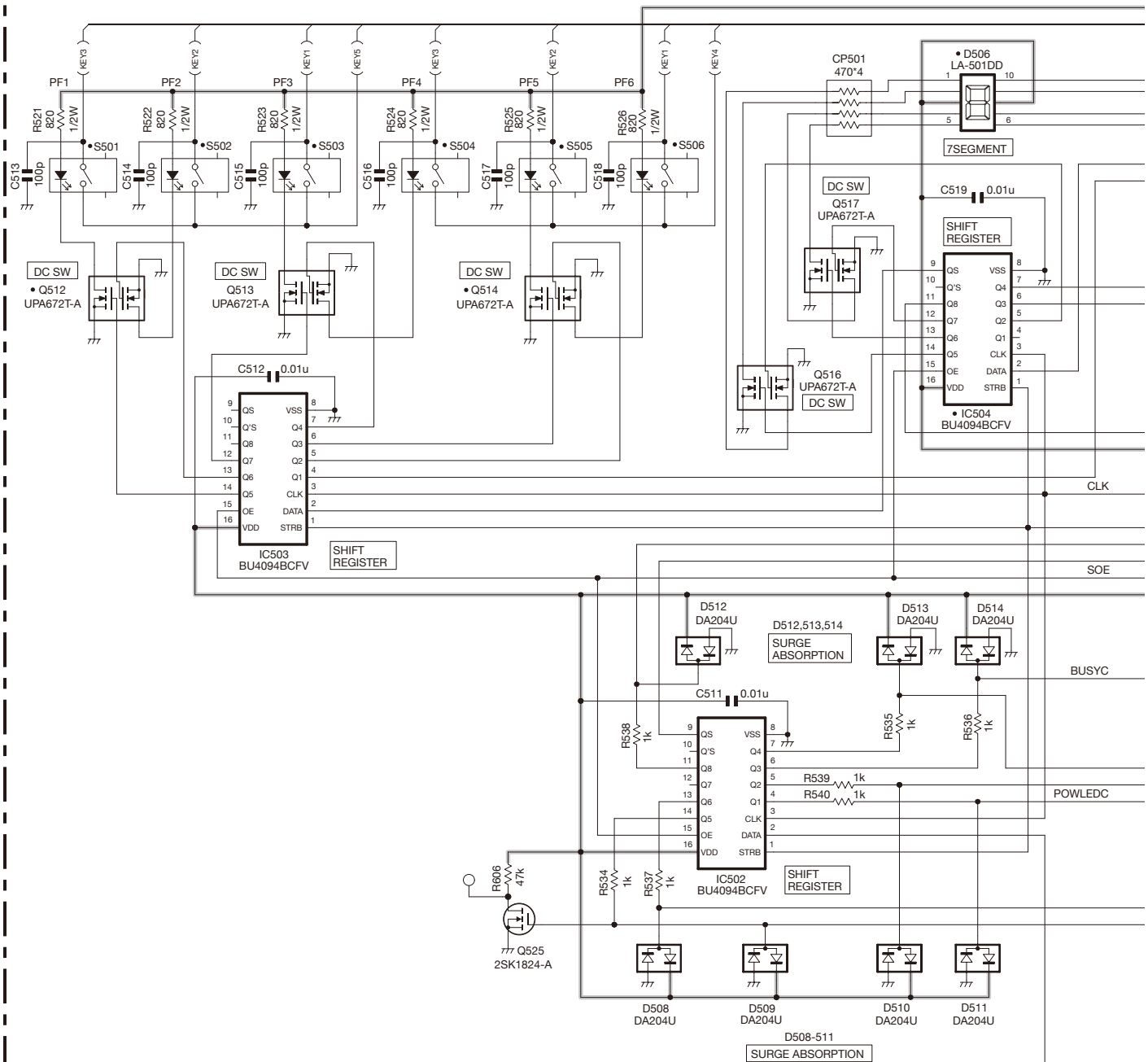
CONTROL UNIT (X53-4490-10)



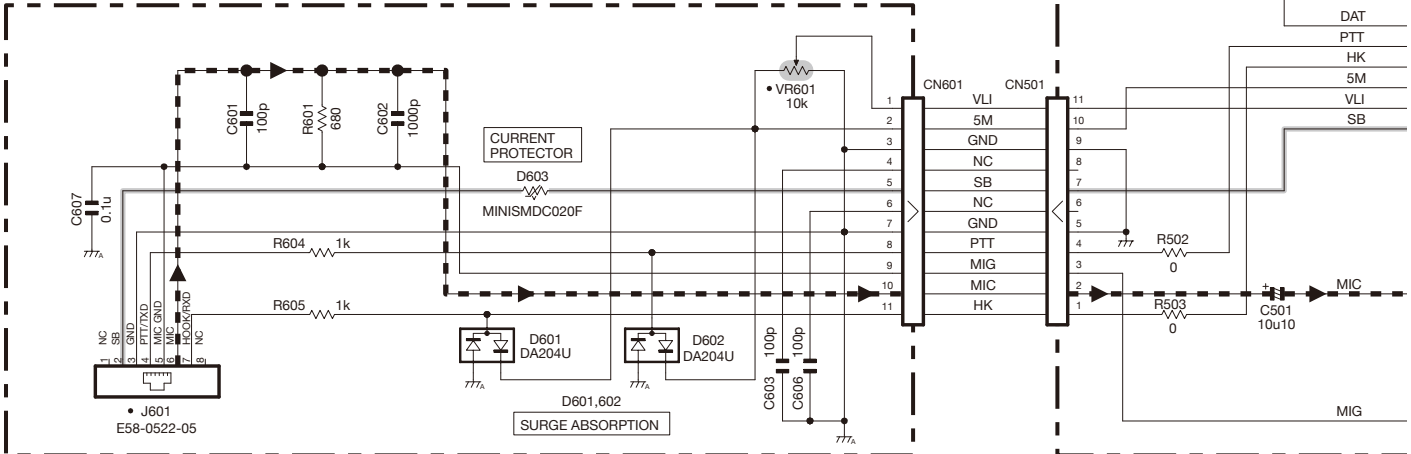
Note : The components marked with a dot (•) are parts of layer 1.

# NXR-810 SCHEMATIC DIAGRAM / 原理图

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



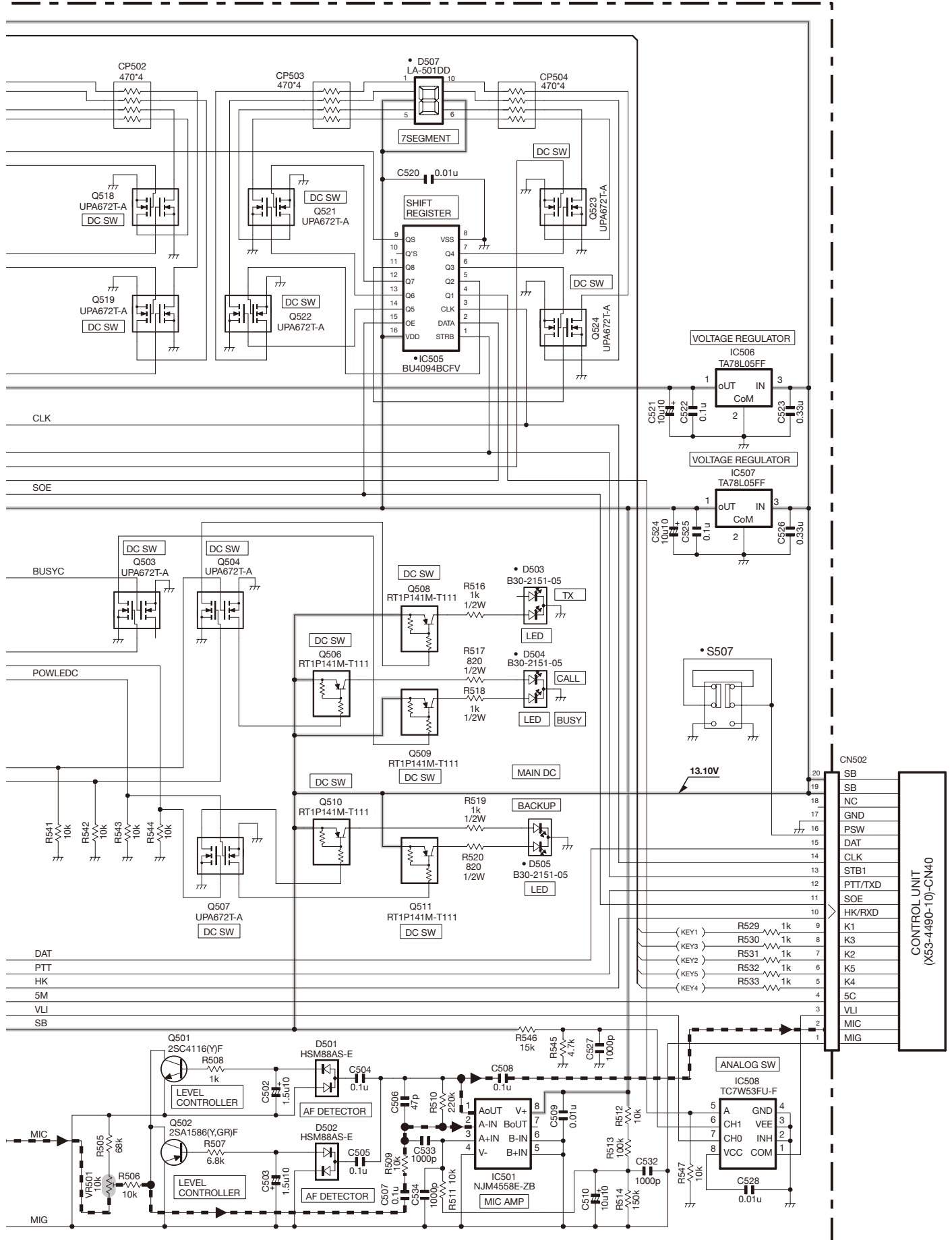
DISPLAY UNIT (X54-3730-20) (B/2)





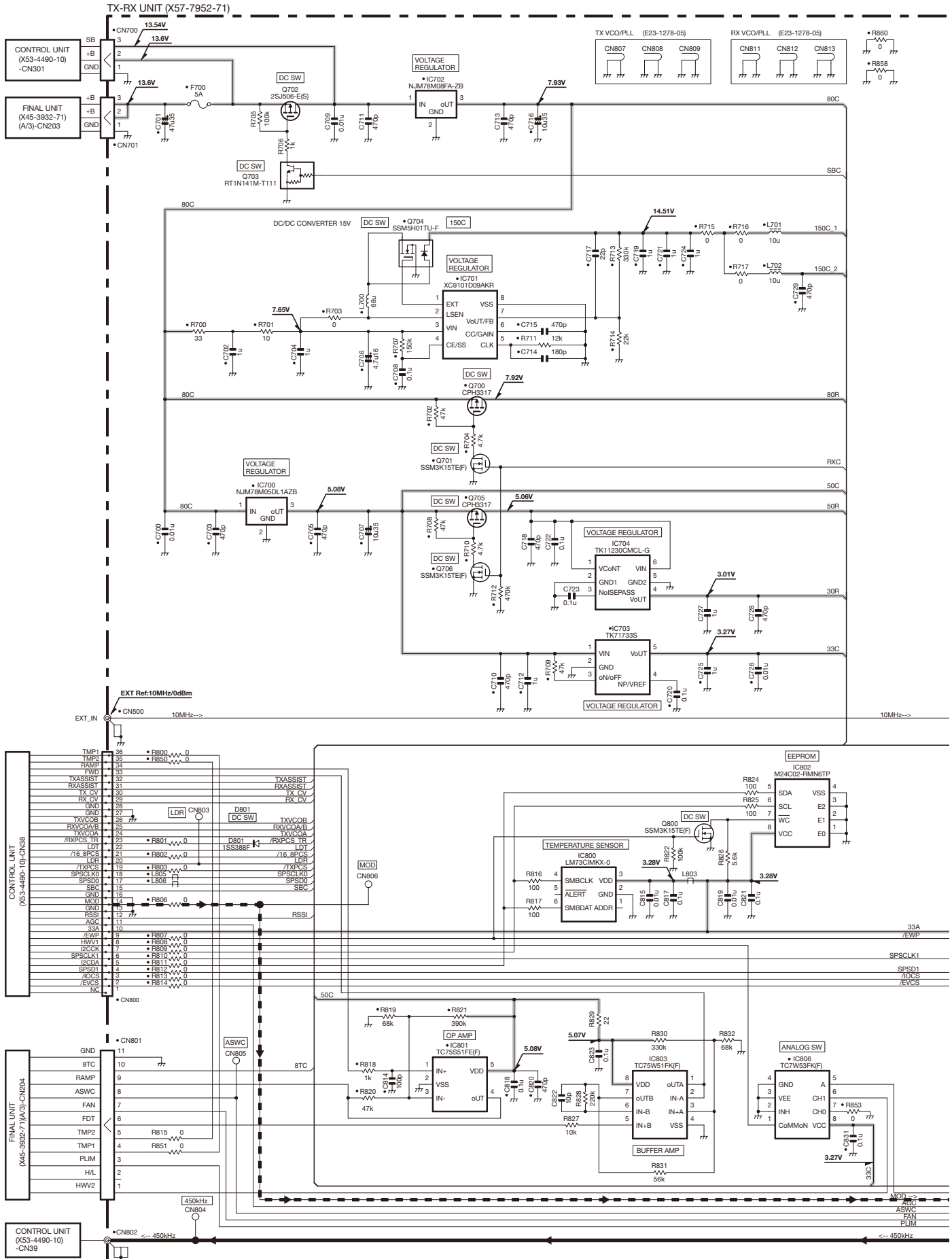
# SCHEMATIC DIAGRAM / 原理图 NXR-810

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



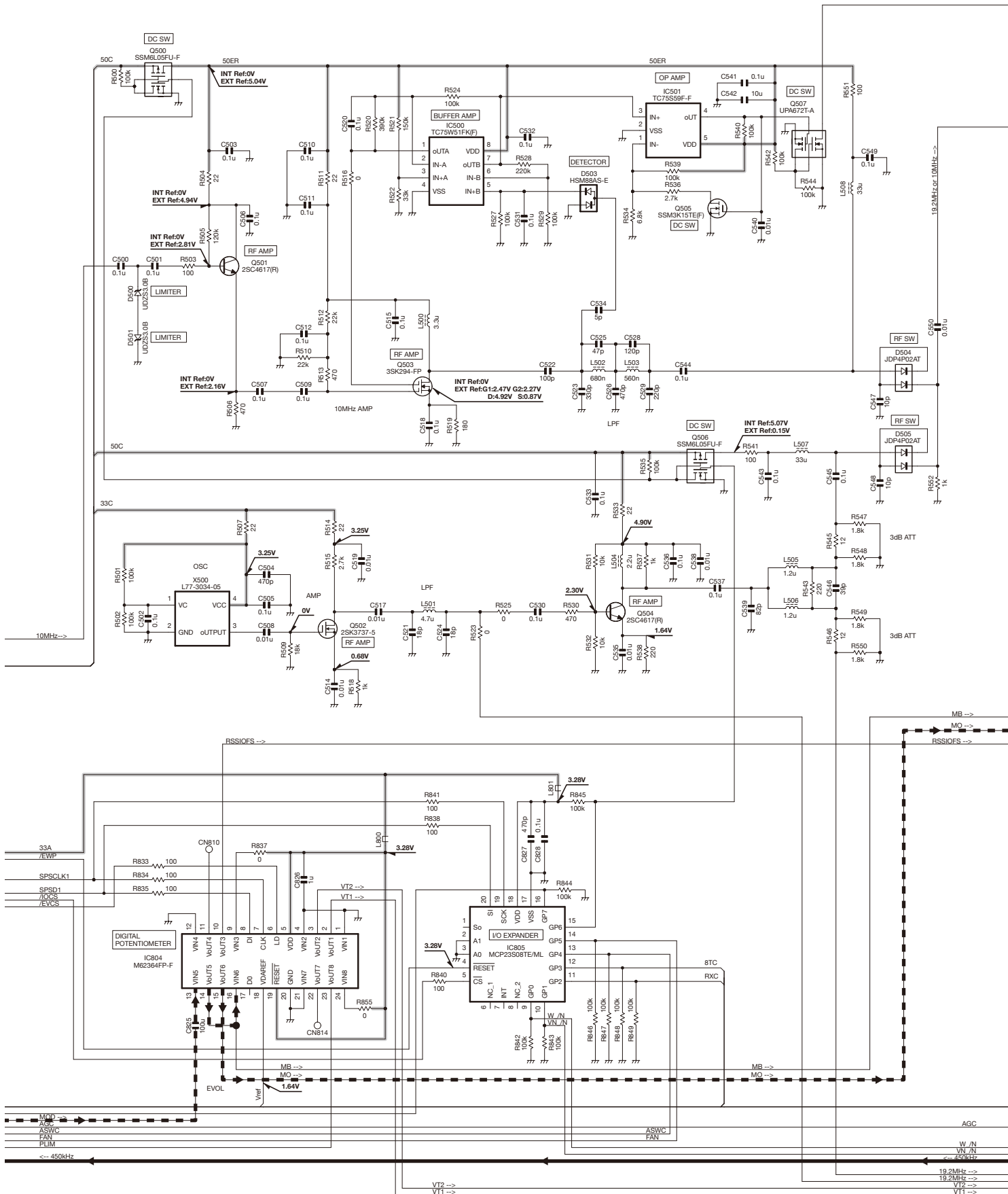
Note : The components marked with a dot (•) are parts of layer 1.

# NXR-810 SCHEMATIC DIAGRAM / 原理图



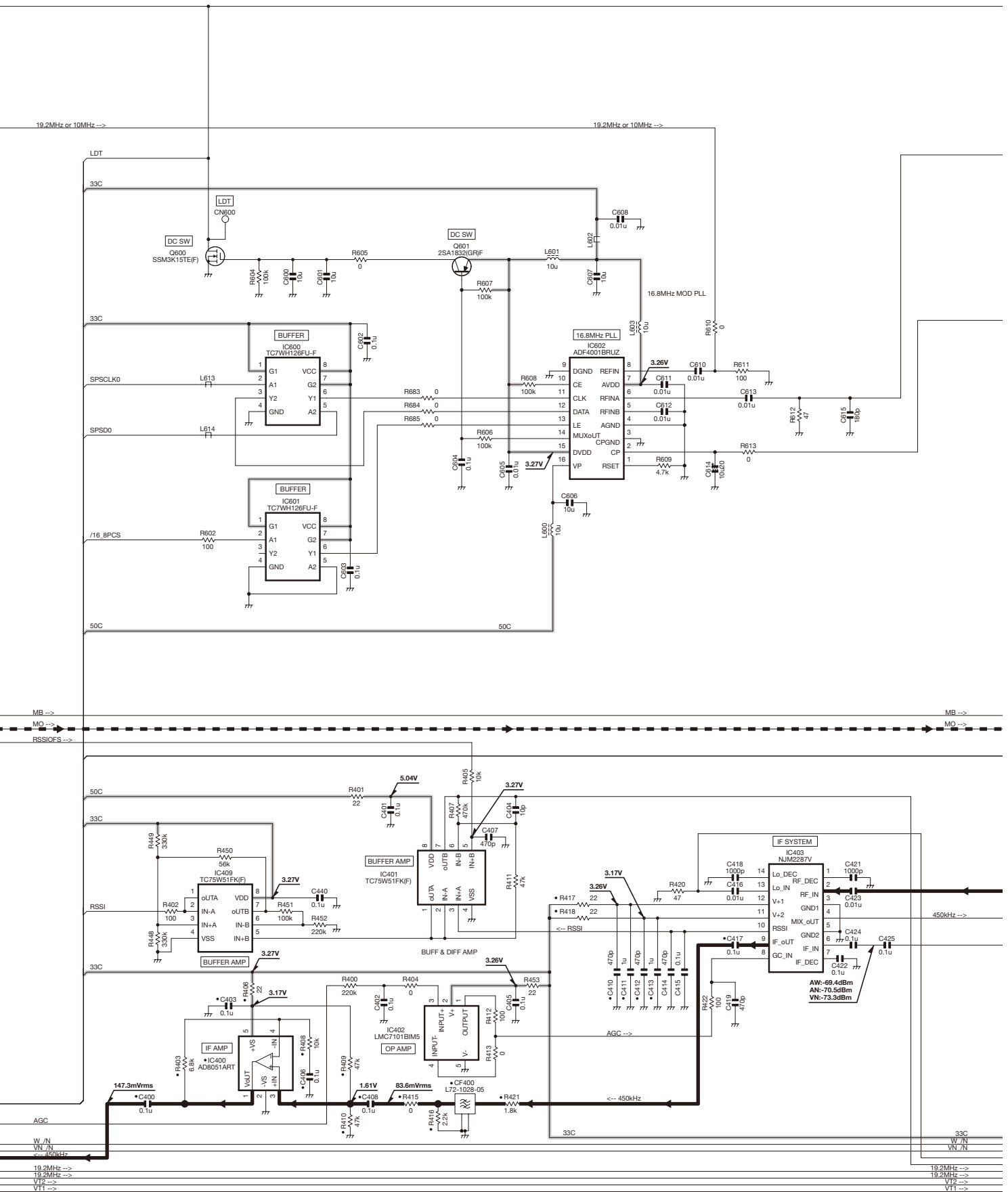
# SCHEMATIC DIAGRAM / 原理图 NXR-810

TX-RX UNIT (X57-7952-71)



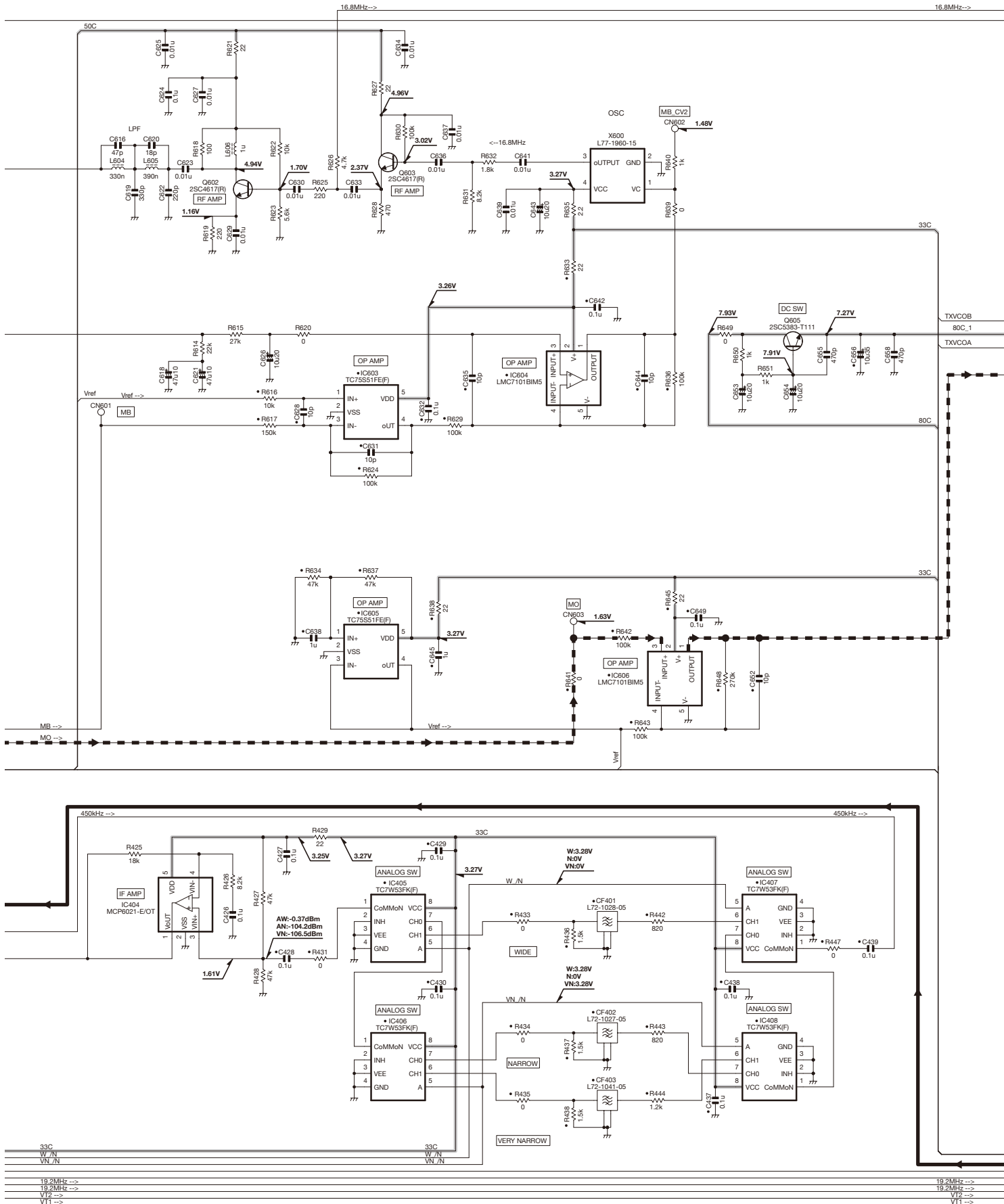
# NXR-810 SCHEMATIC DIAGRAM / 原理图

TX-RX UNIT (X57-7952-71)



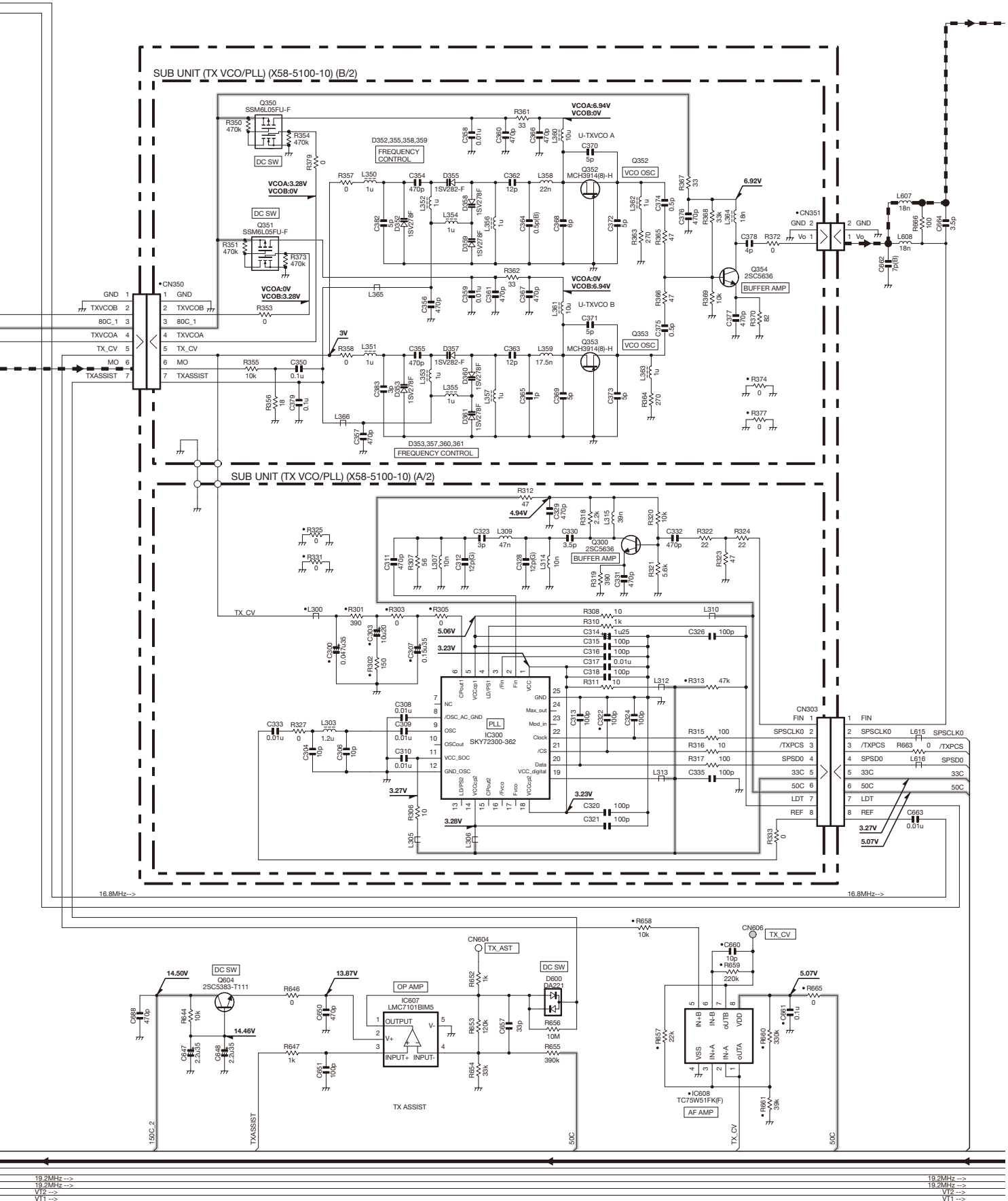
# SCHEMATIC DIAGRAM / 原理图 NXR-810

TX-RX UNIT (X57-7952-71)



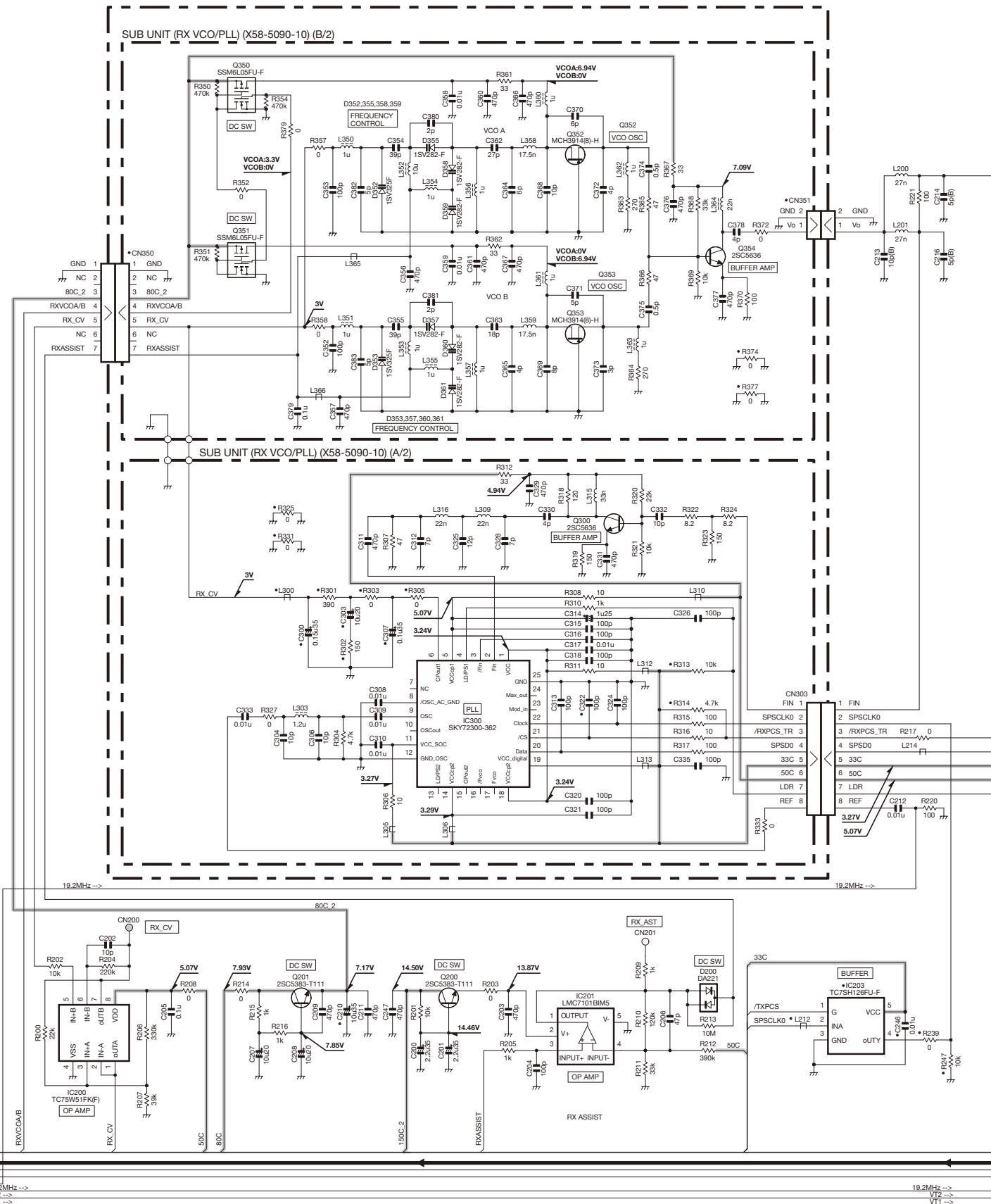
# NXR-810 SCHEMATIC DIAGRAM / 原理图

TX-RX UNIT (X57-7952-71)



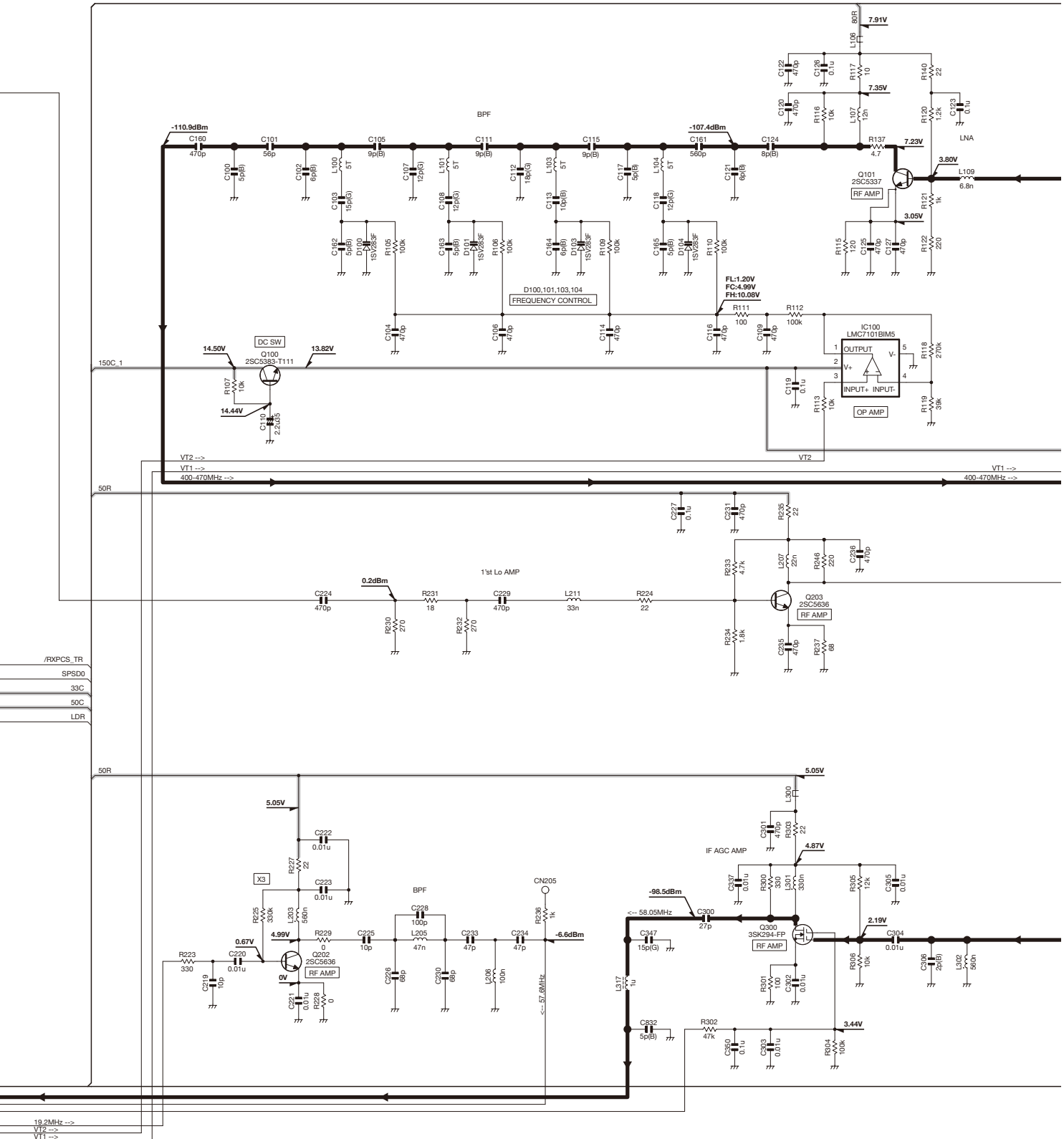
# SCHEMATIC DIAGRAM / 原理图 NXR-810

TX-RX UNIT (X57-7952-71)



# NXR-810 SCHEMATIC DIAGRAM / 原理图

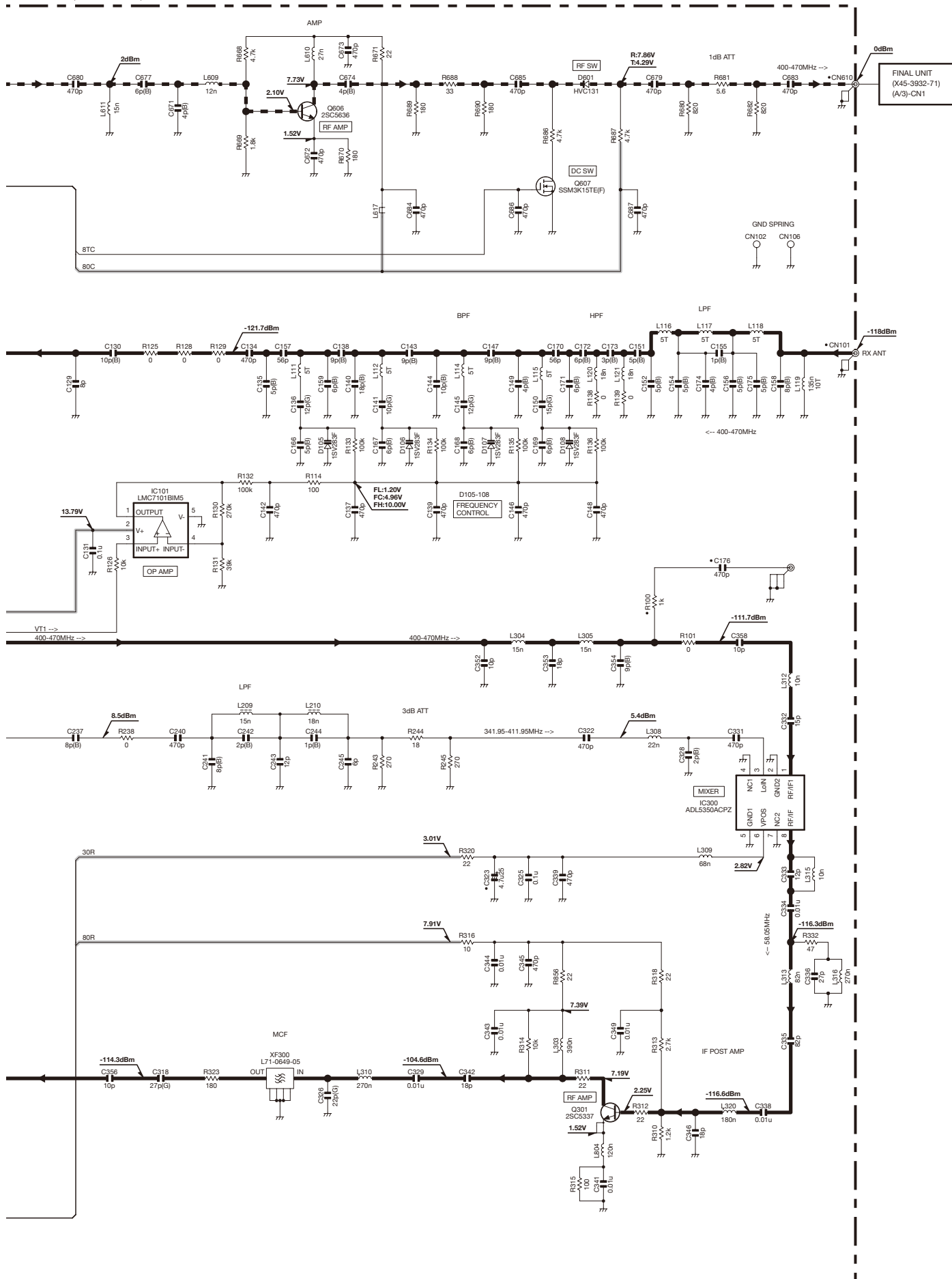
TX-RX UNIT (X57-7952-71)





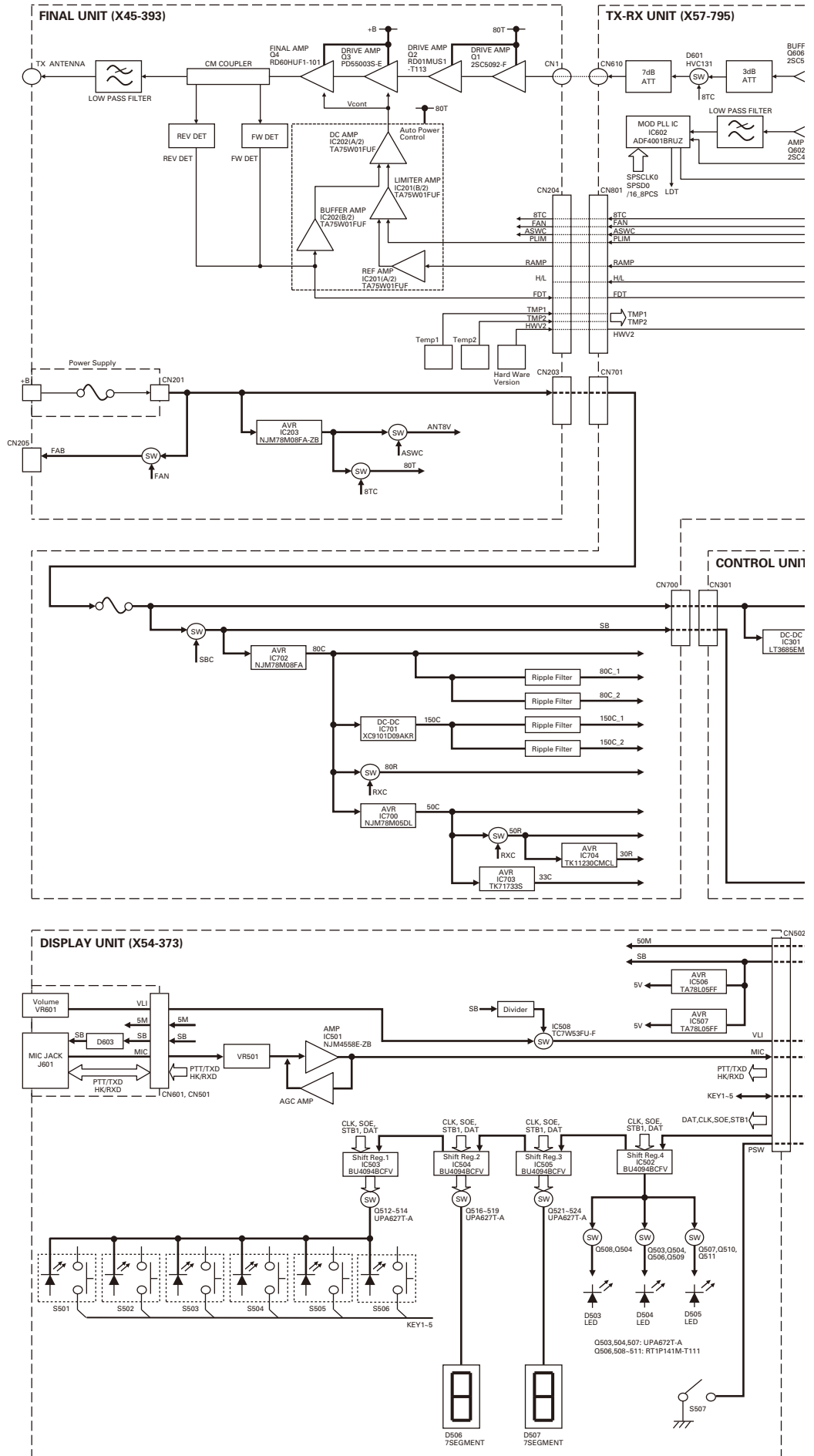
## SCHEMATIC DIAGRAM / 原理图 NXR-810

TX-RX UNIT (X57-7952-71)

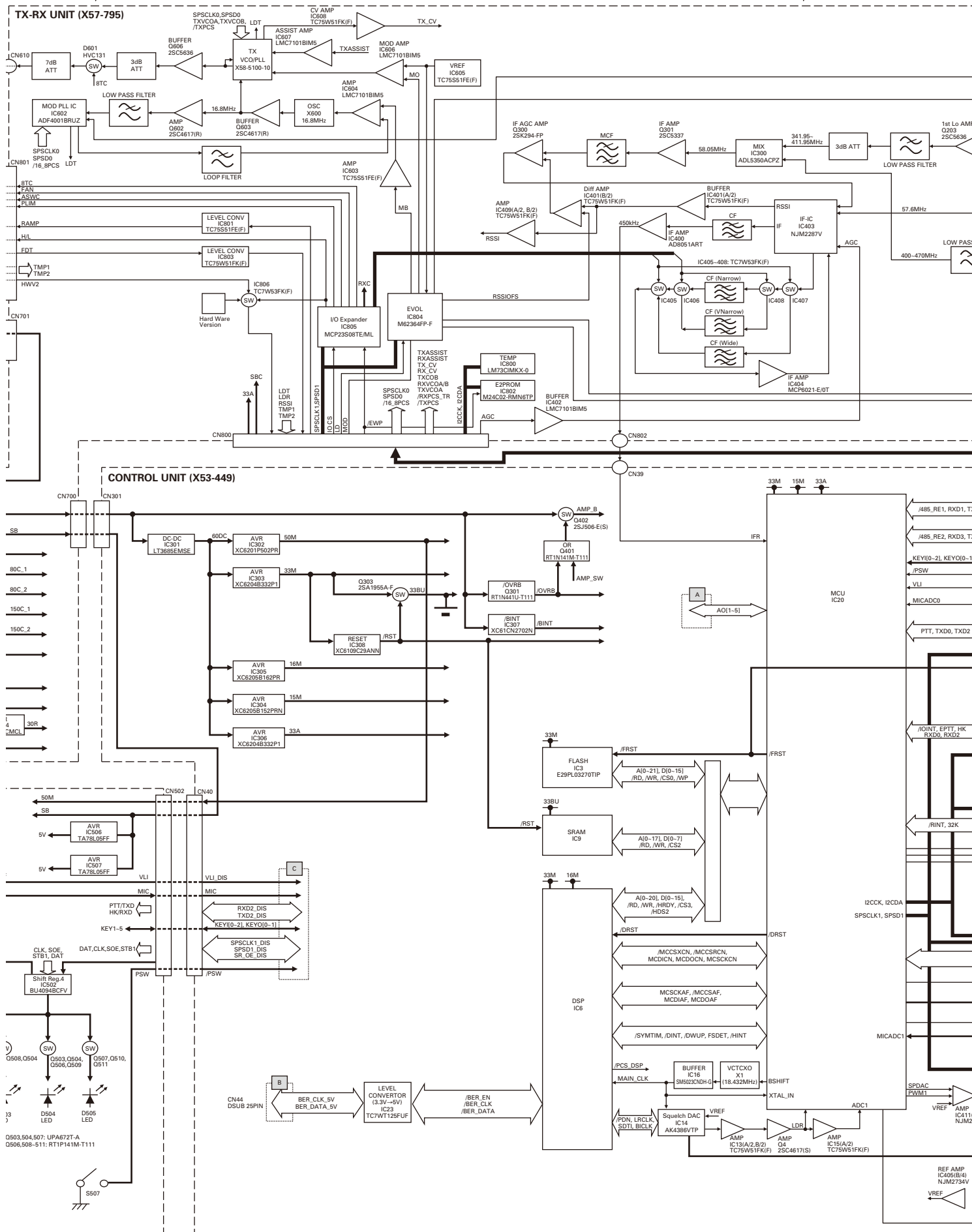


Note : The components marked with a dot (•) are parts of layer 1.

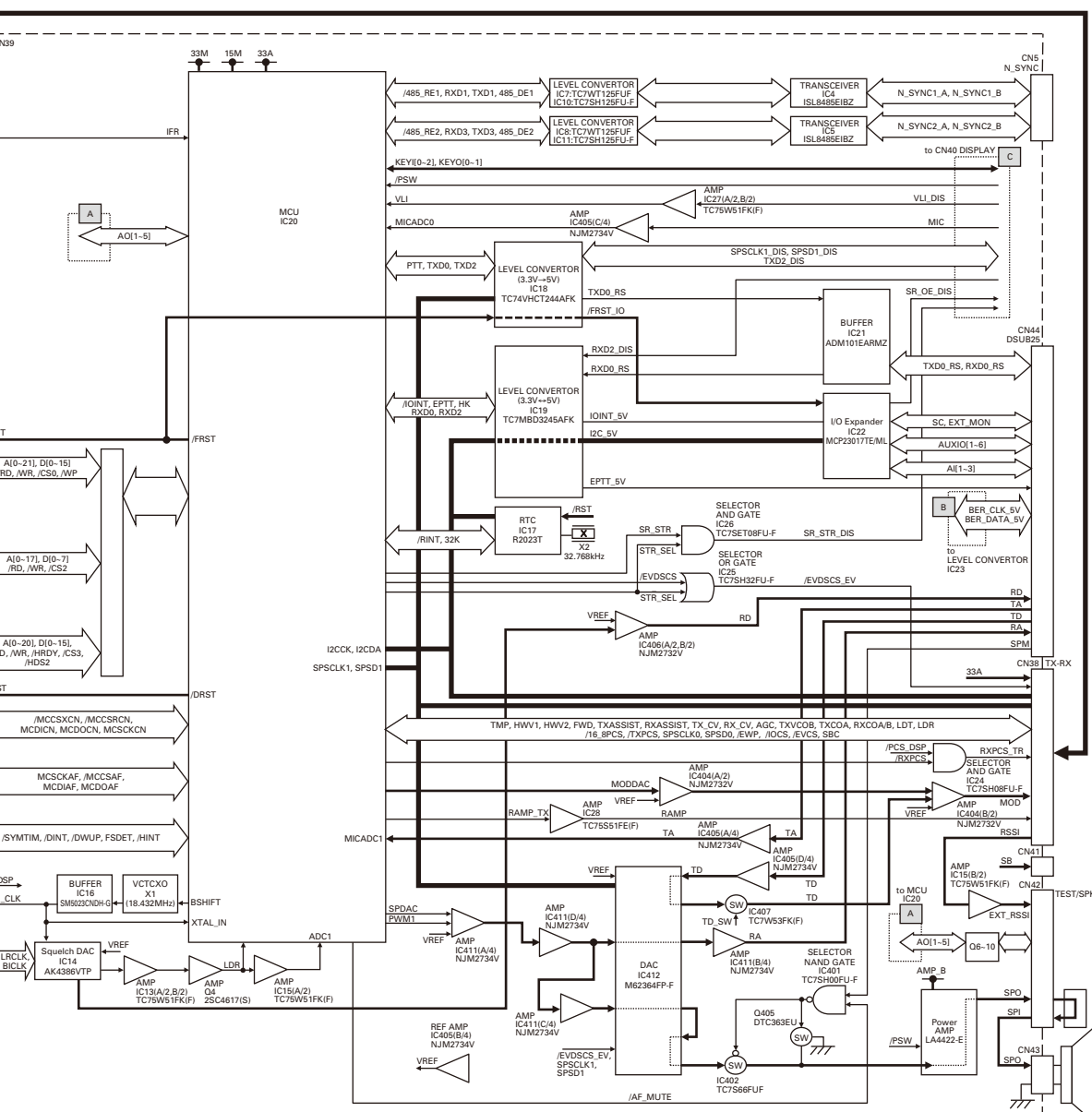
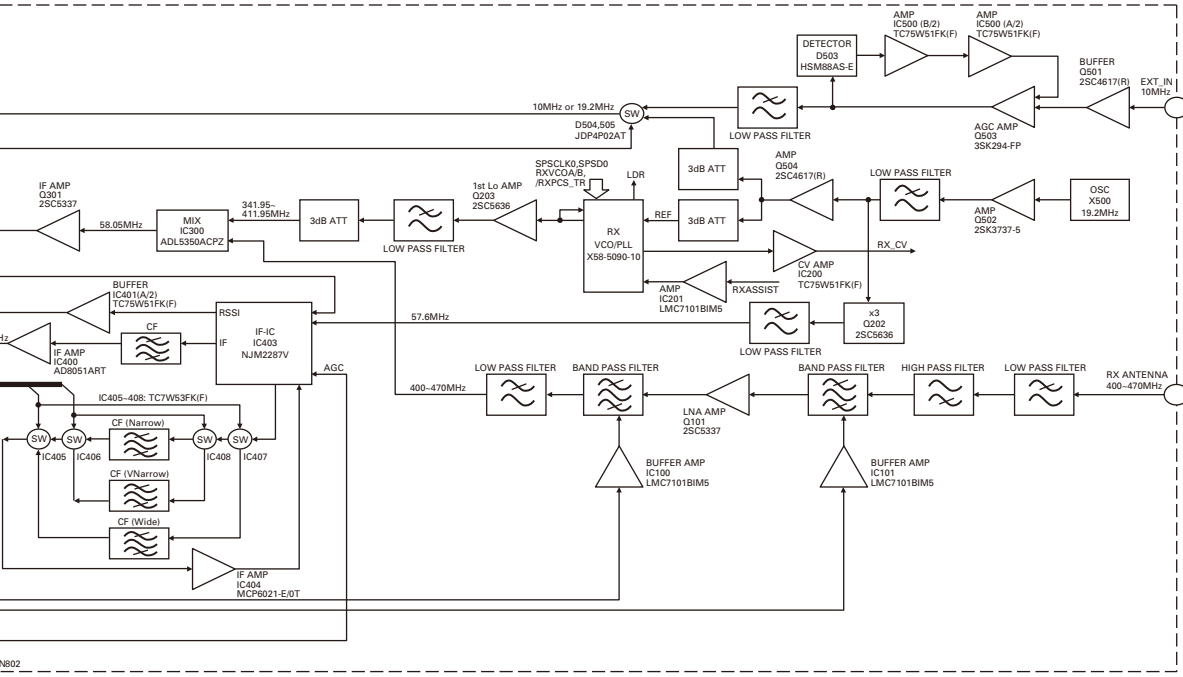
# NXR-810 BLOCK DIAGRAM / 方块图



# BLOCK DIAGRAM / 方块图 NXR-810



# NXR-810 BLOCK DIAGRAM / 方块图



## OPTIONAL ACCESSORIES / 可选附件: KES-5 (EXTERNAL SPEAKER / 外部扬声器)

### When Using an External Speaker

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

### Specifications

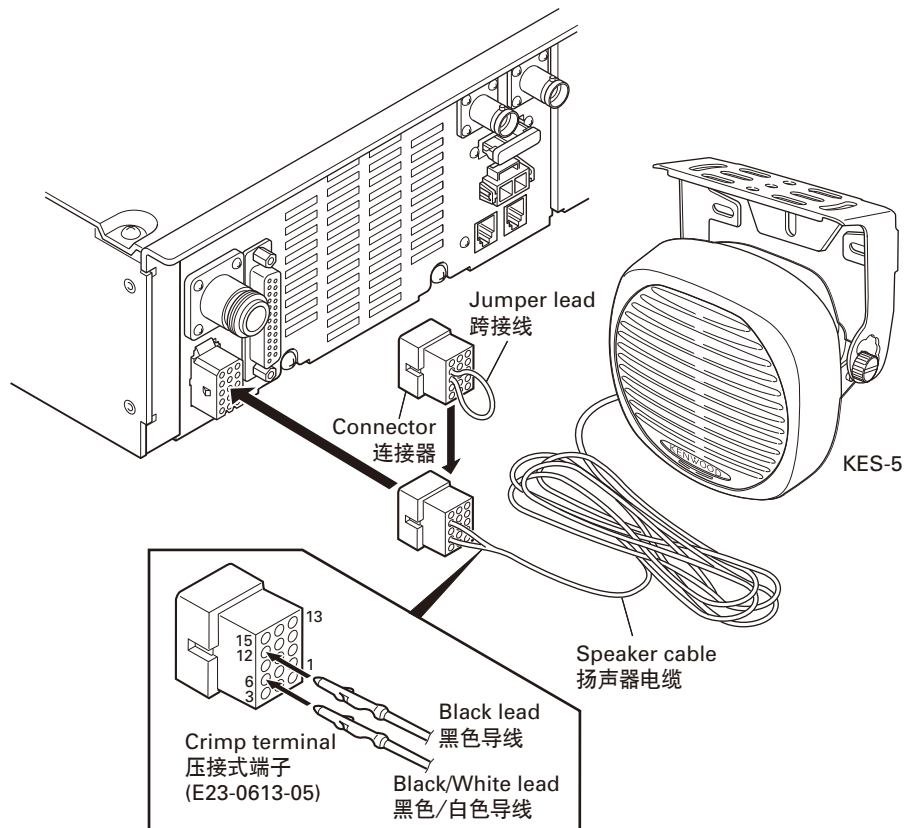
Maximum input power .....	40W
Impedance .....	4Ω
Dimensions (W x H x D) projection not included .....	129 x 129 x 77 mm
Weight .....	820g

### 使用外部扬声器时

1. 确认单元电源已关闭。
2. 使用外部扬声器时，从连接器上拆下跨接线，然后安装扬声器电缆。
3. 不使用外部扬声器时，重新安装跨接线，将连接器插入扬声器插孔（针脚 9 和 12）。

### 规格

最大输入功率.....	40W
阻抗.....	4Ω
尺寸（宽 × 高 × 深）不包括凸起部分 .....	129×129×77 mm
重量.....	820g



## SPECIFICATIONS

### General

Frequency Ranges.....	400~470MHz
Number of Channels.....	30
Channel Spacing	
Analogue.....	12.5/ 25kHz
Digital.....	6.25/ 12.5kHz
PLL Channel Step.....	3.125/ 5kHz
Antenna Impedance .....	50Ω
Operating Voltage.....	10.8~15.6V DC
Current Drain	
Standby.....	0.5A
Receive.....	1.0A
Transmit.....	11.0A
Duty Cycle (TX, RX).....	100% at 25W, 50% at maximum power
Operating Temperature Range .....	-30°C~+60°C
Frequency Stability .....	±1.0ppm
Dimension (W x H x D) (Projections not included).....	483 x 88 x 340 mm
Weight.....	9.7kg

### Receiver

Sensitivity (Analog)	
EIA 12dB SINAD.....	0.28μV
Sensitivity (Digital)	
3% BER.....	12.5kHz: 0.28μV, 6.25kHz: 0.22μV
Adjacent Channel Selectivity (Analog).....	25kHz: 80dB, 12.5kHz: 74dB
Intermodulation (Analog).....	72dB
Spurious Respons Rejection (Analog).....	85dB
Audio Distortion.....	Less than 2.5% at 1000Hz
Audio Output.....	4W (at 4Ω, less than 5% distortion)

### Transmitter

RF Power Output.....	5~40W
Modulation Limiting (Analog).....	±5.0kHz (25kHz), ±2.5kHz (12.5kHz)
Spurious Emission.....	-36dBm≤1GHz, -30dBm>1GHz
FM Noise (EIA) (Analog).....	25kHz: 55dB, 12.5kHz: 50dB
Modulation Distortion.....	Less than 1% at 1000Hz
Modulation.....	16K0F3E, 8K50F3E, 8K30F1E, 4K00F1E

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

## 规 格

## 概 述

频率范围.....	400~470MHz
信道数量.....	30
信道间隔	
模拟.....	12.5/25kHz
数字.....	6.25/12.5kHz
PLL 信道步长.....	3.125/5kHz
天线阻抗.....	50 $\Omega$
工作电源电压.....	10.8~15.6V DC
电流消耗	
待机时.....	0.5A
接收时.....	1.0A
发射时.....	11.0A
工作循环（发射，接收）.....	在 25W 时 100%，在最大功率时 50%
工作温度范围.....	-30°C ~ +60°C
频率稳定度.....	$\pm 1.0$ ppm
外型尺寸（宽 $\times$ 高 $\times$ 长）（未包括凸起部分）.....	483 $\times$ 88 $\times$ 340 mm
重    量.....	9.7kg

## 接 收

灵敏度（模拟）	
EIA 12dB SINAD.....	0.28 $\mu$ V
选择性（数字）	
3% BER.....	12.5kHz:0.28 $\mu$ V, 6.25kHz:0.22 $\mu$ V
邻道选择性（模拟）.....	25kHz:80dB, 12.5kHz:74dB
互调抑制（模拟）.....	72dB
杂散响应（模拟）.....	85dB
音频失真.....	在 1000Hz 时低于 2.5%
音频输出功率.....	4W(4 $\Omega$ 时, 失真低于 5%)

## 发 射

射频功率输出.....	5~40W
调制限制（模拟）.....	$\pm 5.0$ kHz(25kHz), $\pm 2.5$ kHz(12.5kHz)
杂散抑制.....	-36dBm $\leq$ 1GHz, -30dBm $>$ 1GHz
调频噪声 (EIA)（模拟）.....	25kHz:55dB, 12.5kHz:50dB
调制失真.....	在 1000Hz 时低于 1%
调    制.....	16K0F3E, 8K50F3E, 8K30F1E, 4K00F1E

依据 EN 标准或 TIA/EIA 603 获得的模拟测量值和所示规格均为典型值。  
建伍公司有权变更技术规格，恕不预先通知。

# NXR-810

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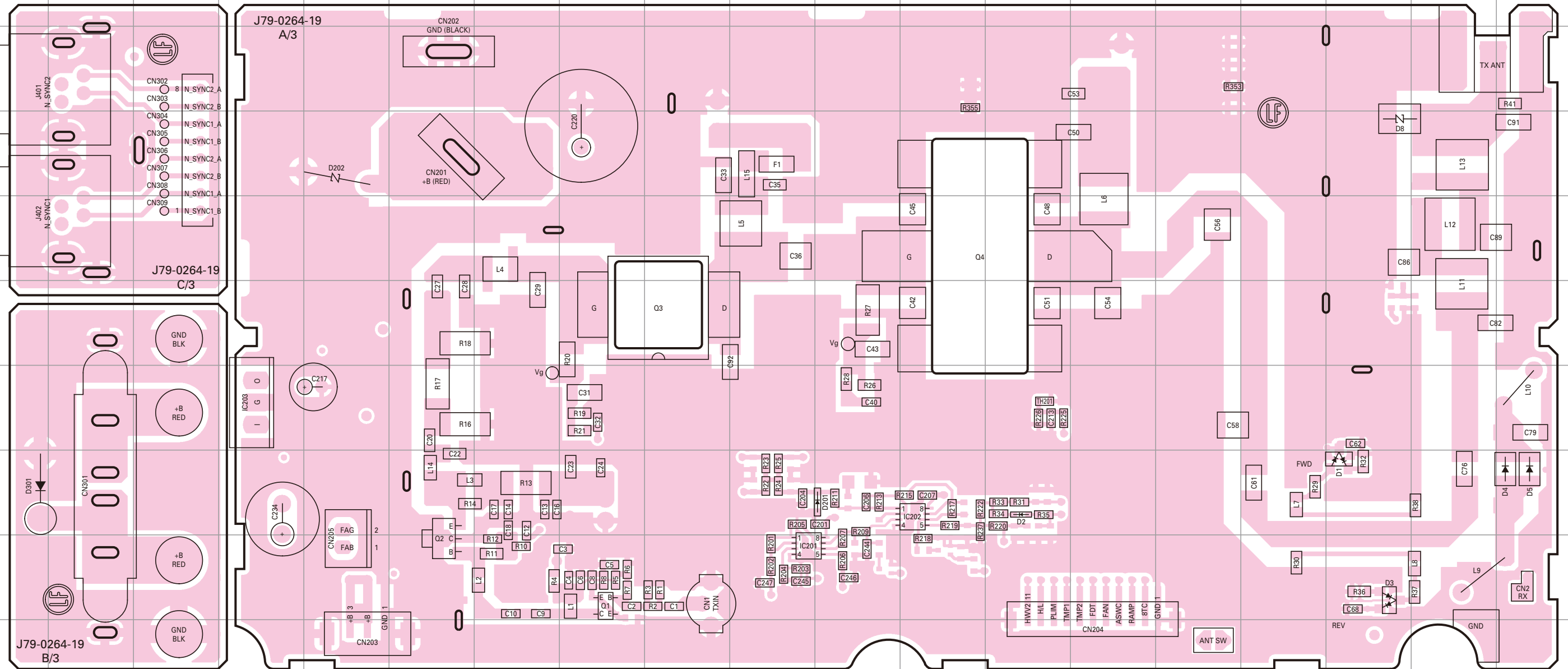


# NXR-810 PC BOARD / PC板

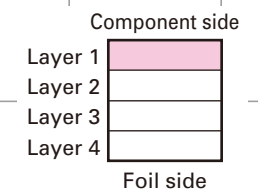
# PC BOARD / PC板 NXR-810

**FINAL UNIT (X45-3932-71)**  
**Component side view (J79-0264-19)**

**FINAL UNIT (X45-3932-71)**  
**Component side view (J79-0264-19)**



Ref. No.	Address	Ref. No.	Address
IC201	9J	D2	8M
IC202	8L	D3	9Q
IC203	7D	D4	8S
Q1	9H	D5	8S
Q2	9F	D8	4Q
Q3	6I	D201	8K
Q4	5L	D202	4E
D1	8Q	D301	8A

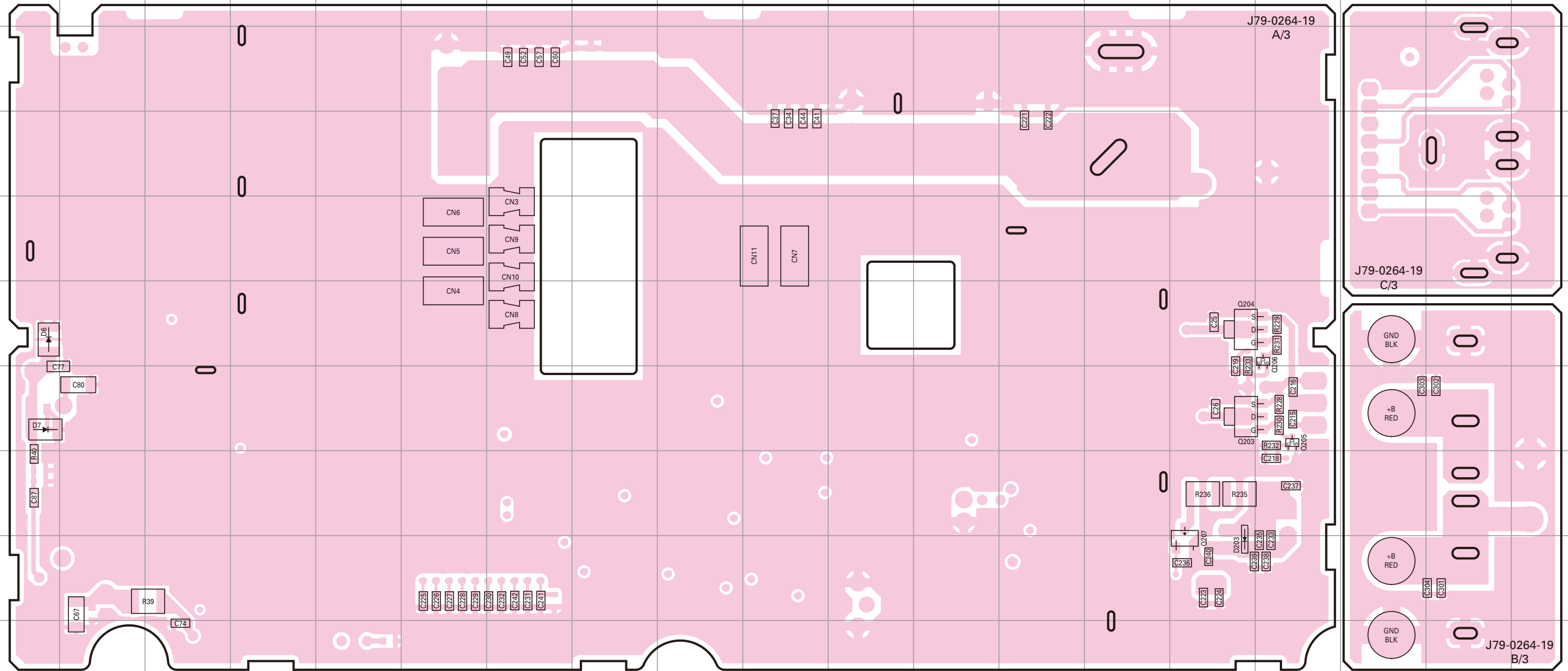


# NXR-810 PC BOARD / PC板

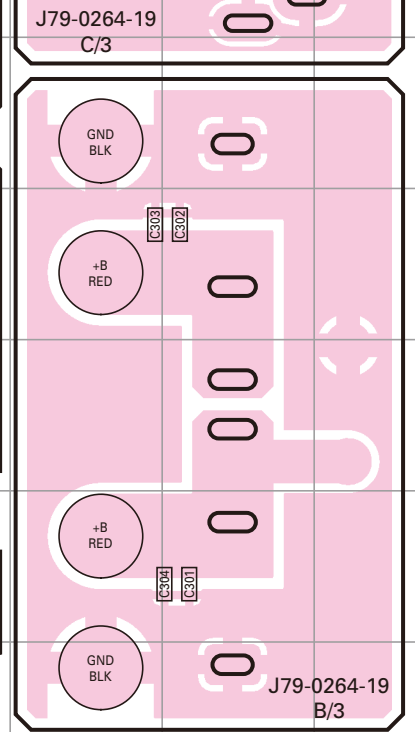
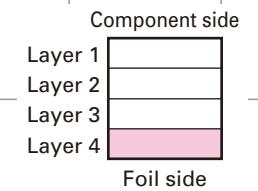
# PC BOARD / PC板 NXR-810

**FINAL UNIT (X45-3932-71)**  
**Foil side view (J79-0264-19)**

**FINAL UNIT (X45-3932-71)**  
**Foil side view (J79-0264-19)**



Ref. No.	Address
Q203	7O
Q204	6O
Q205	7P
Q206	6P
Q207	9O
D6	6A
D7	7A
D203	9O



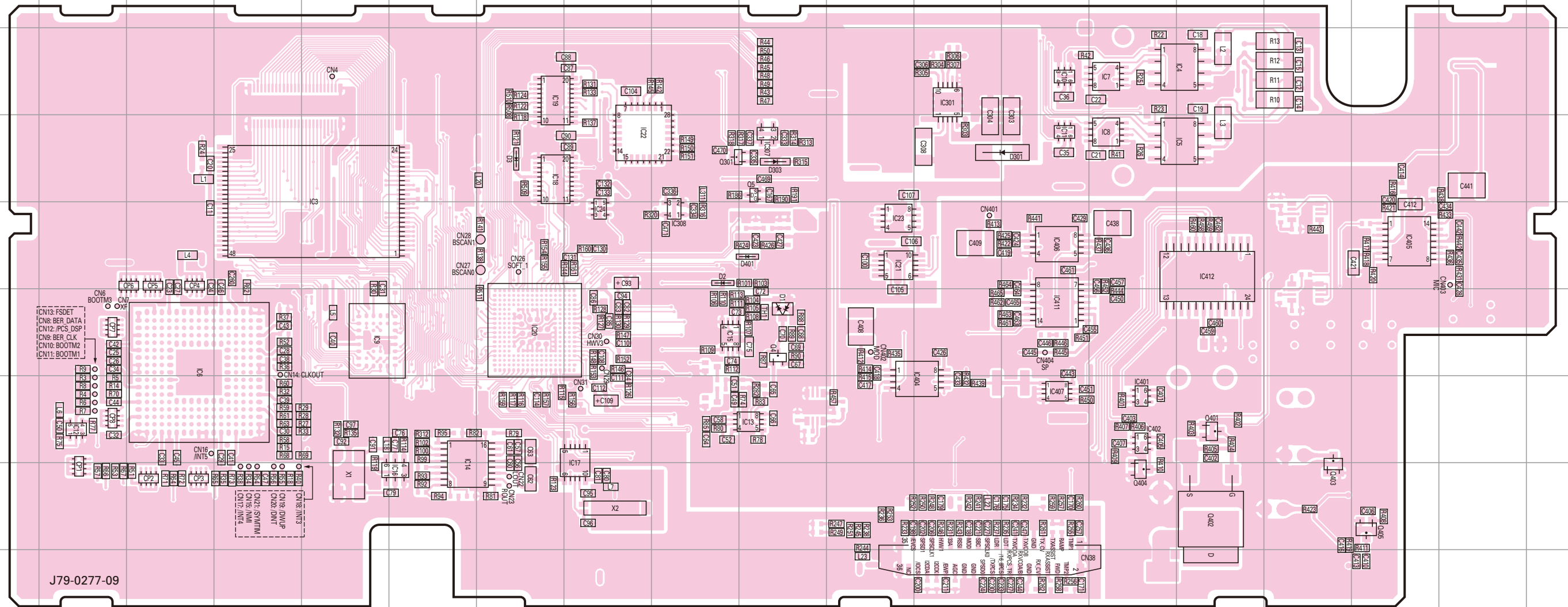


# NXR-810 PC BOARD / PC板

# PC BOARD / PC板 NXR-810

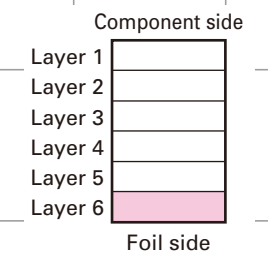
**CONTROL UNIT (X53-4490-10)**  
Foil side view (J79-0277-09)

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



J79-0277-09

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

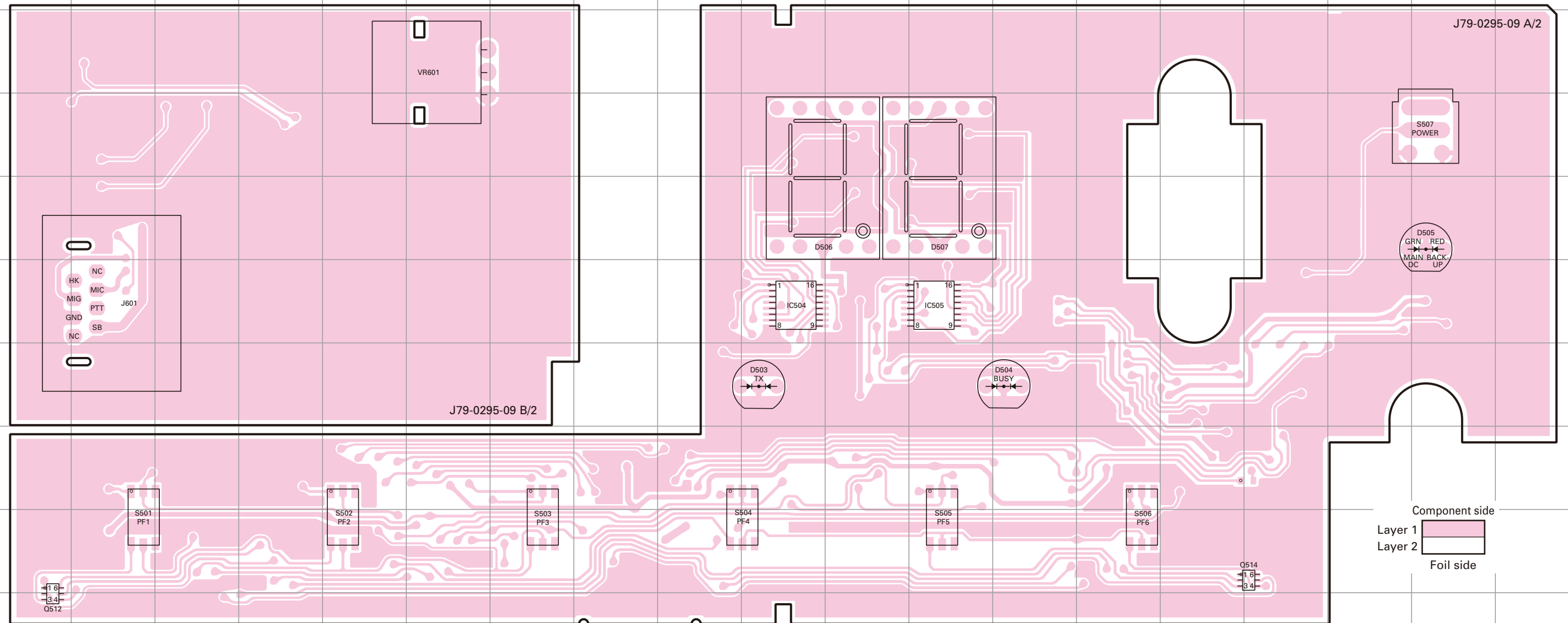


# NXR-810 PC BOARD / PC板

# PC BOARD / PC板 NXR-810

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

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



Component side  
 Layer 1  
 Layer 2  
 Foil side

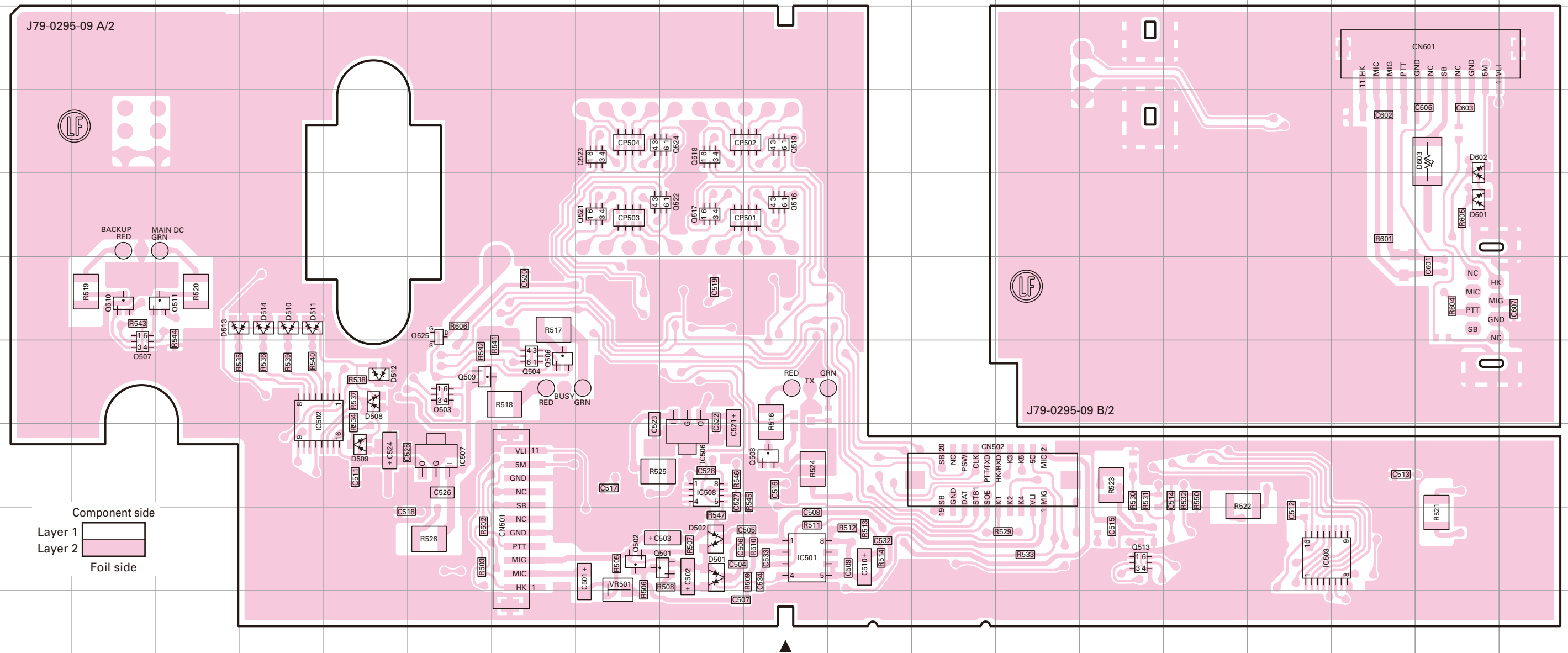
Ref. No.	Address
IC504	6J
IC505	6L
Q512	10A
Q514	9P
D503	7J
D504	7M
D505	5R
D506	5J
D507	5L

# NXR-810 PC BOARD / PC板

# PC BOARD / PC板 NXR-810

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

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



Component side  
 Layer 1  
 Layer 2  
 Foil side

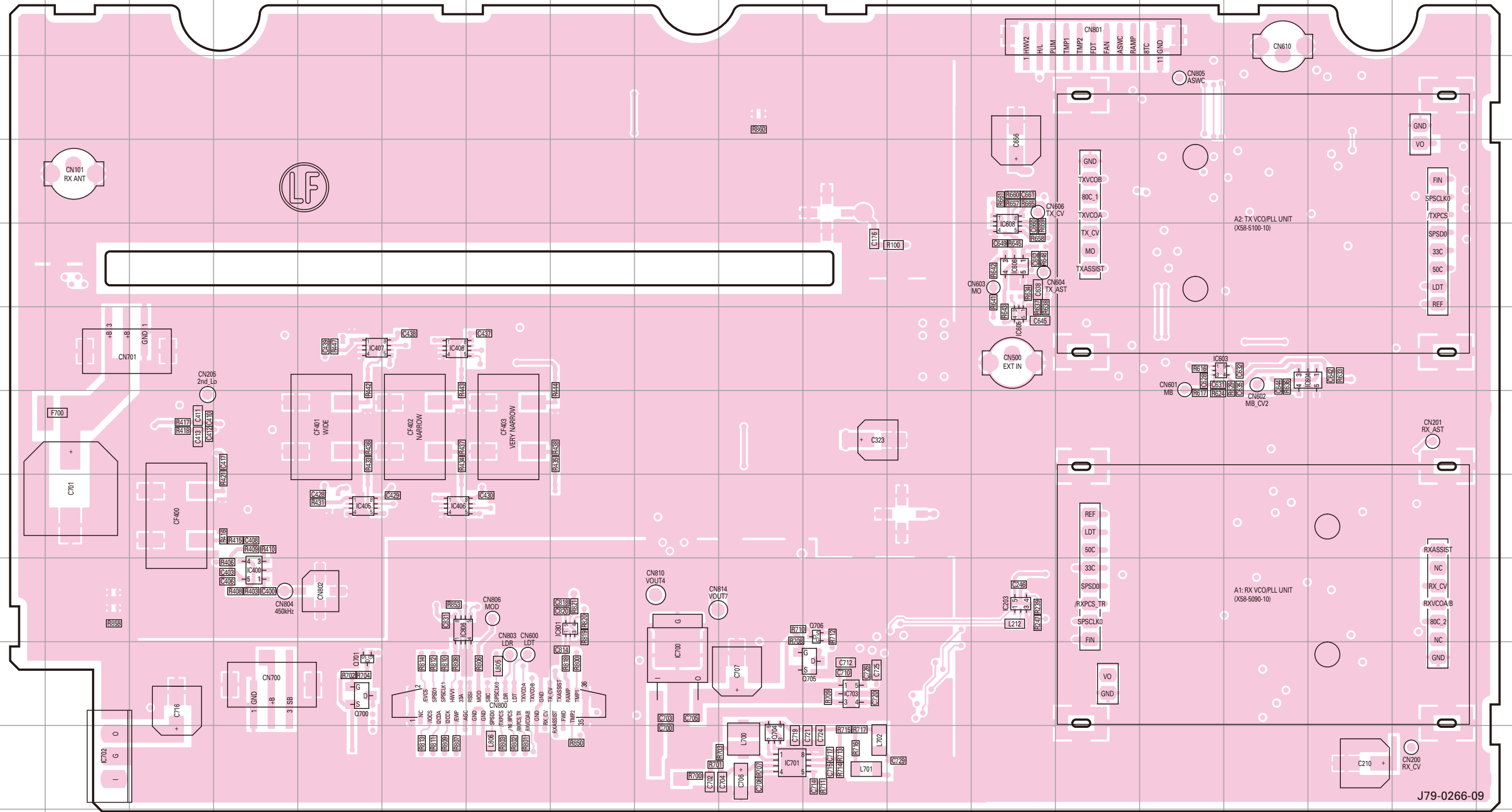
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IC502	7D	Q507	7B	Q521	5H	D511	6D
IC503	9P	Q508	8J	Q522	5I	D512	7E
IC506	8I	Q509	7F	Q523	4H	D513	6C
IC507	8F	Q510	6B	Q524	4I	D514	6D
IC508	8I	Q511	6C	Q525	6F	D601	5R
Q501	9I	Q513	9N	D501	9I	D602	4R
Q502	9H	Q516	5J	D502	9I	D603	4R
Q503	7F	Q517	5I	D508	7E		
Q504	7G	Q518	4I	D509	8E		

# NXR-810 PC BOARD / PC板

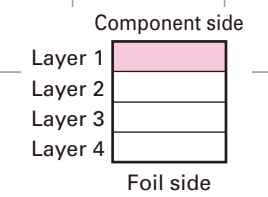
# PC BOARD / PC板 NXR-810

**TX-RX UNIT (X57-7952-71)**  
**Component side view (J79-0266-09)**

**TX-RX UNIT (X57-7952-71)**  
**Component side view (J79-0266-09)**



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



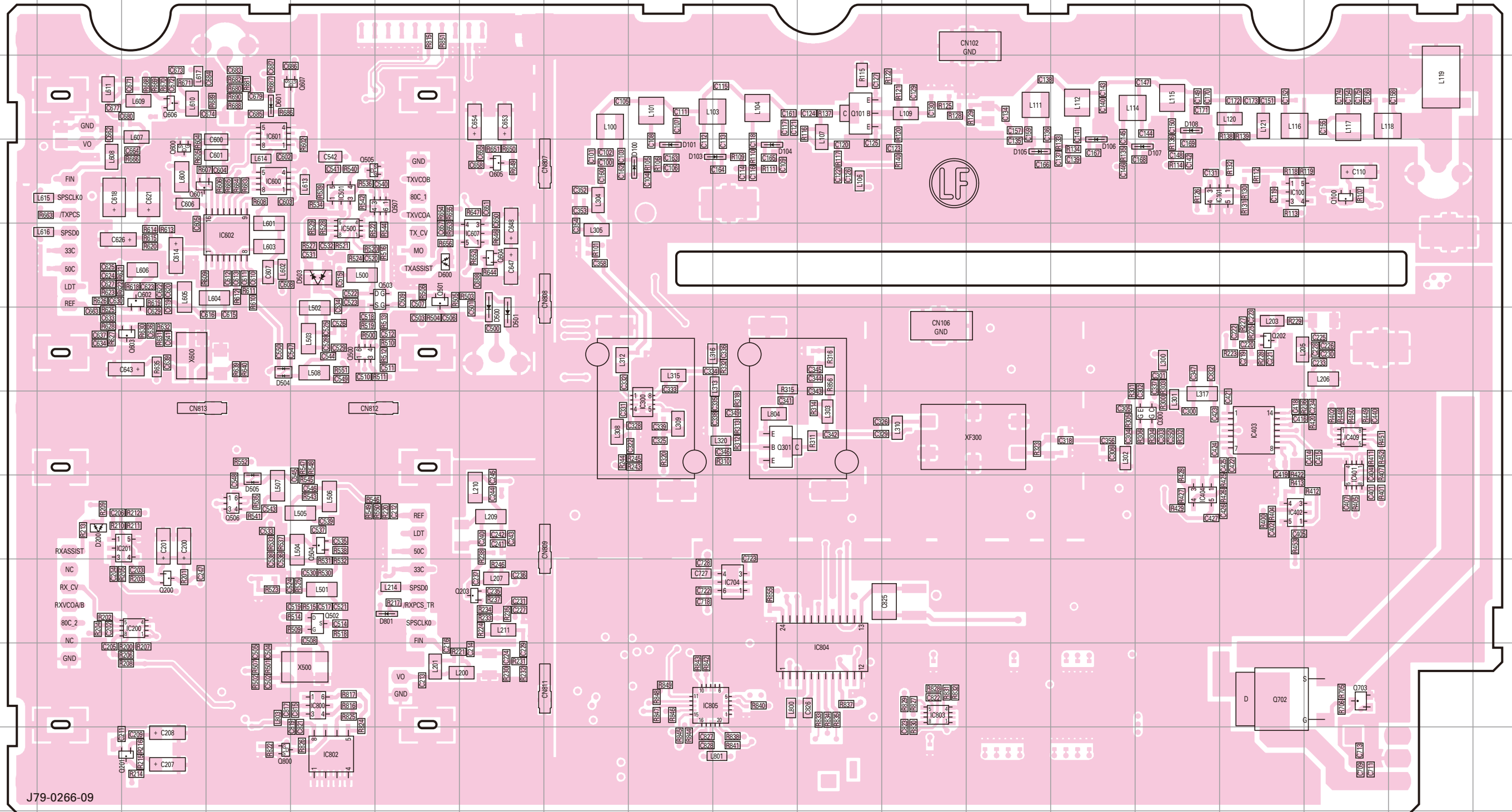
J79-0266-09

# NXR-810 PC BOARD / PC板

# PC BOARD / PC板 NXR-810

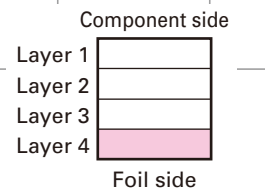
TX-RX UNIT (X57-7952-71)  
Foil side view (J79-0266-09)

TX-RX UNIT (X57-7952-71)  
Foil side view (J79-0266-09)



J79-0266-09

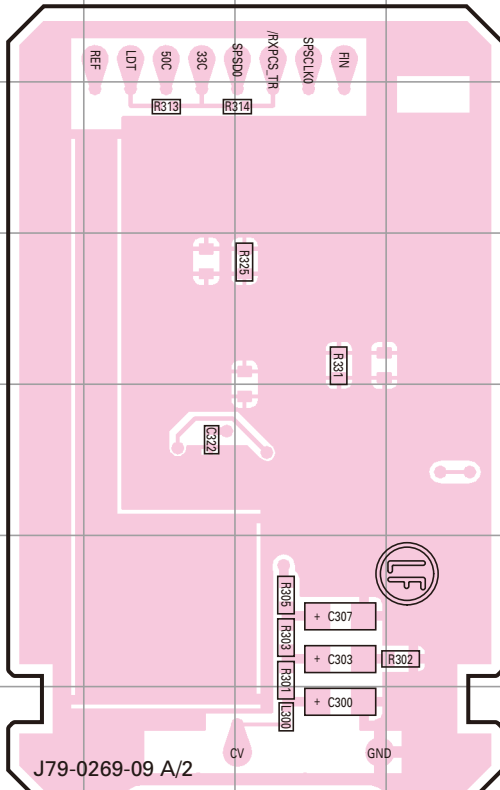
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IC100	4P	IC402	8P	IC600	4D	IC802	11E	Q200	9C	Q500	6E	Q506	8D	Q604	5G	Q800	11D	D106	4N	D503	5E
IC101	4O	IC403	7P	IC601	3D	IC803	10L	Q201	11C	Q501	5F	Q507	4F	Q605	4G	D100	4I	D107	4O	D504	6D
IC200	9C	IC404	8O	IC602	5D	IC804	10K	Q202	6P	Q502	9E	Q600	4C	Q606	3C	D101	4I	D108	3O	D505	8D
IC201	8C	IC409	7Q	IC607	5G	IC805	10I	Q203	9G	Q503	5F	Q601	4C	Q607	3E	D103	4I	D200	8B	D600	5F
IC300	7I	IC500	5E	IC704	9J	Q100	4Q	Q300	7O	Q504	8E	Q602	5C	Q702	10P	D104	4J	D500	6G	D601	3D
IC401	8Q	IC501	4E	IC800	10E	Q101	3K	Q301	7J	Q505	4E	Q603	6C	Q703	10Q	D105	4M	D501	6G	D801	9F



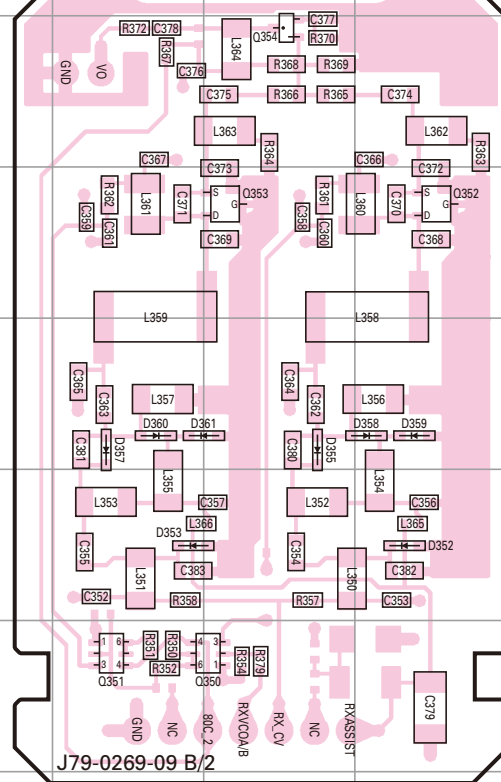
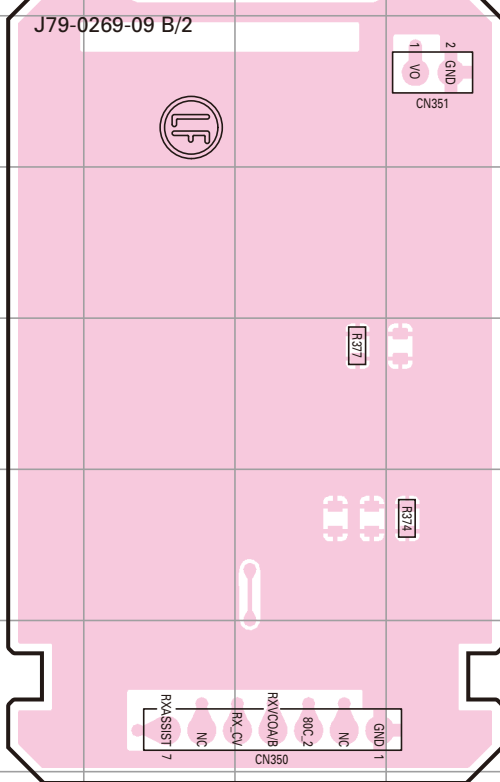
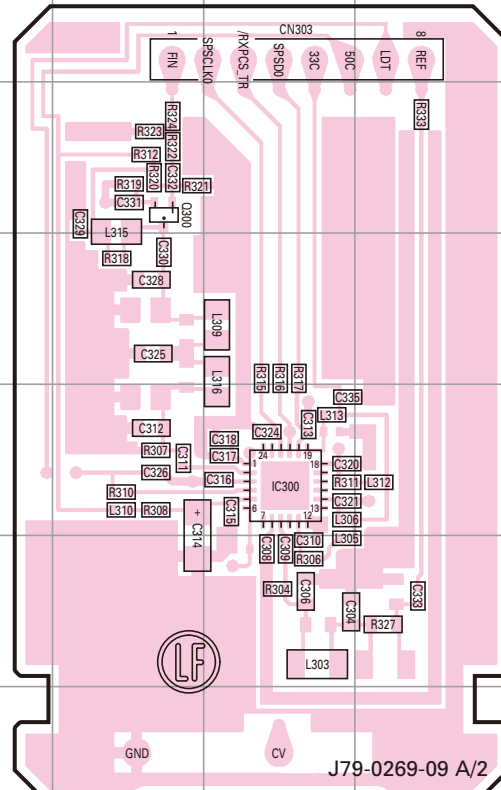


# NXR-810 PC BOARD / PC板

**RX VCO/PLL UNIT (X58-5090-10)**  
**Component side view (J79-0269-09)**



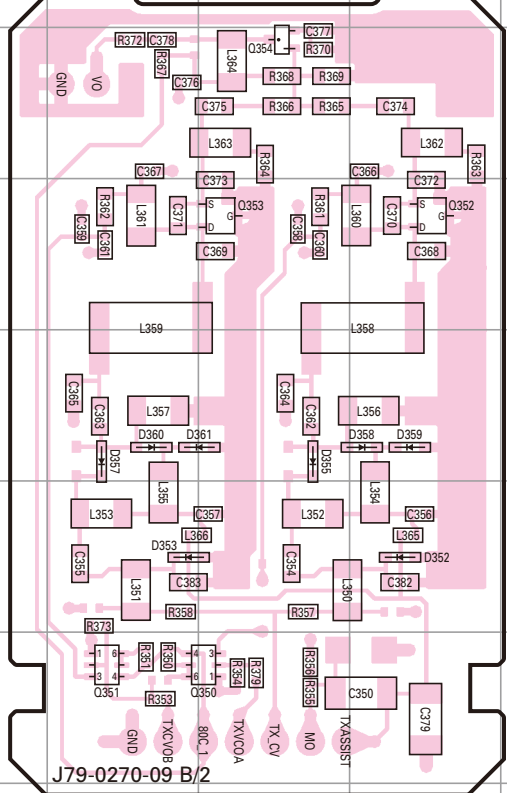
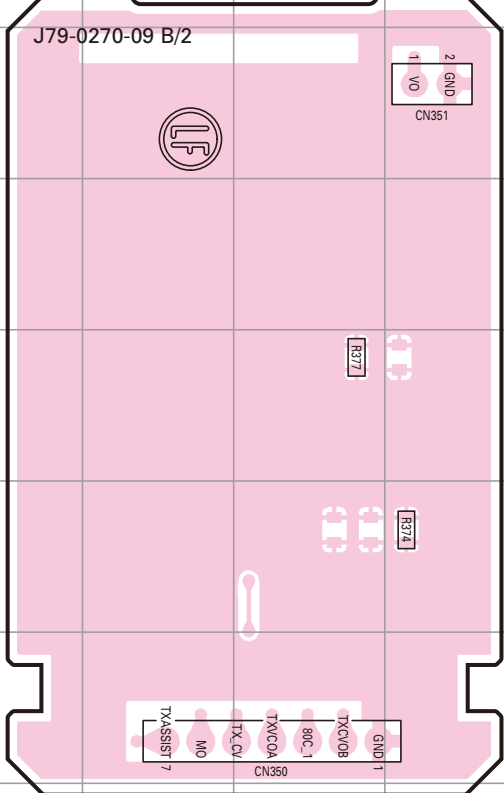
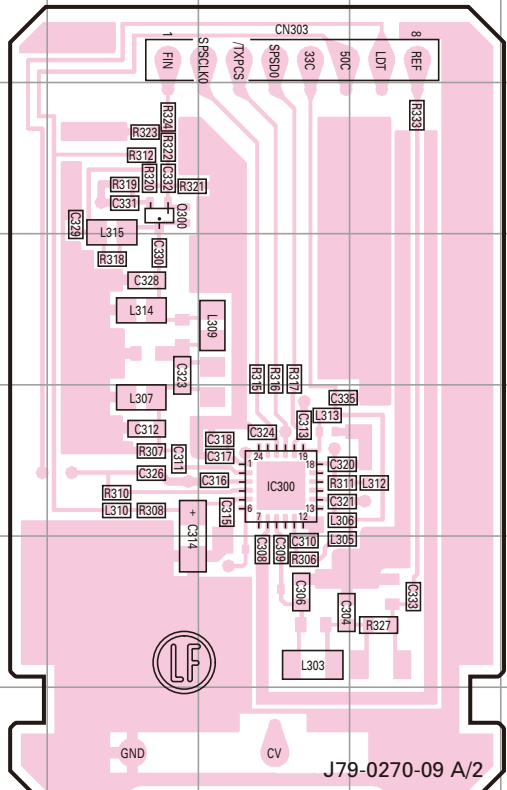
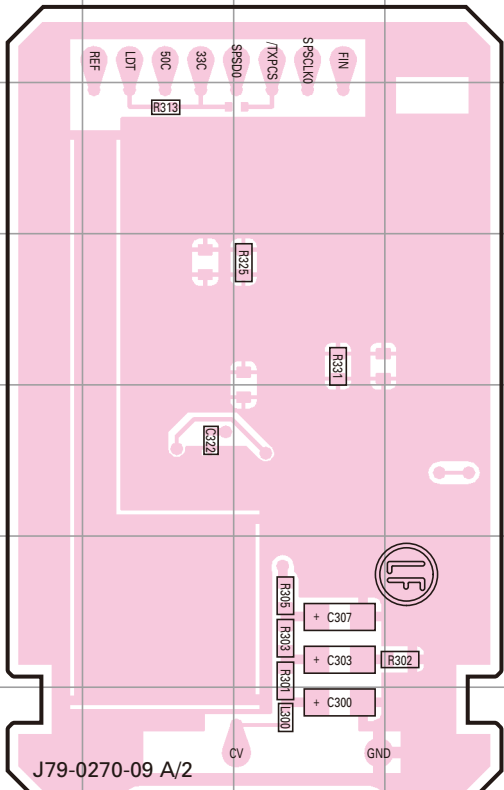
**RX VCO/PLL UNIT (X58-5090-10)**  
**Foil side view (J79-0269-09)**



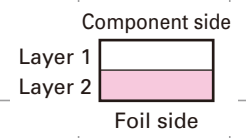
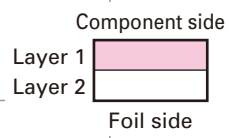
# PC BOARD / PC板 NXR-810

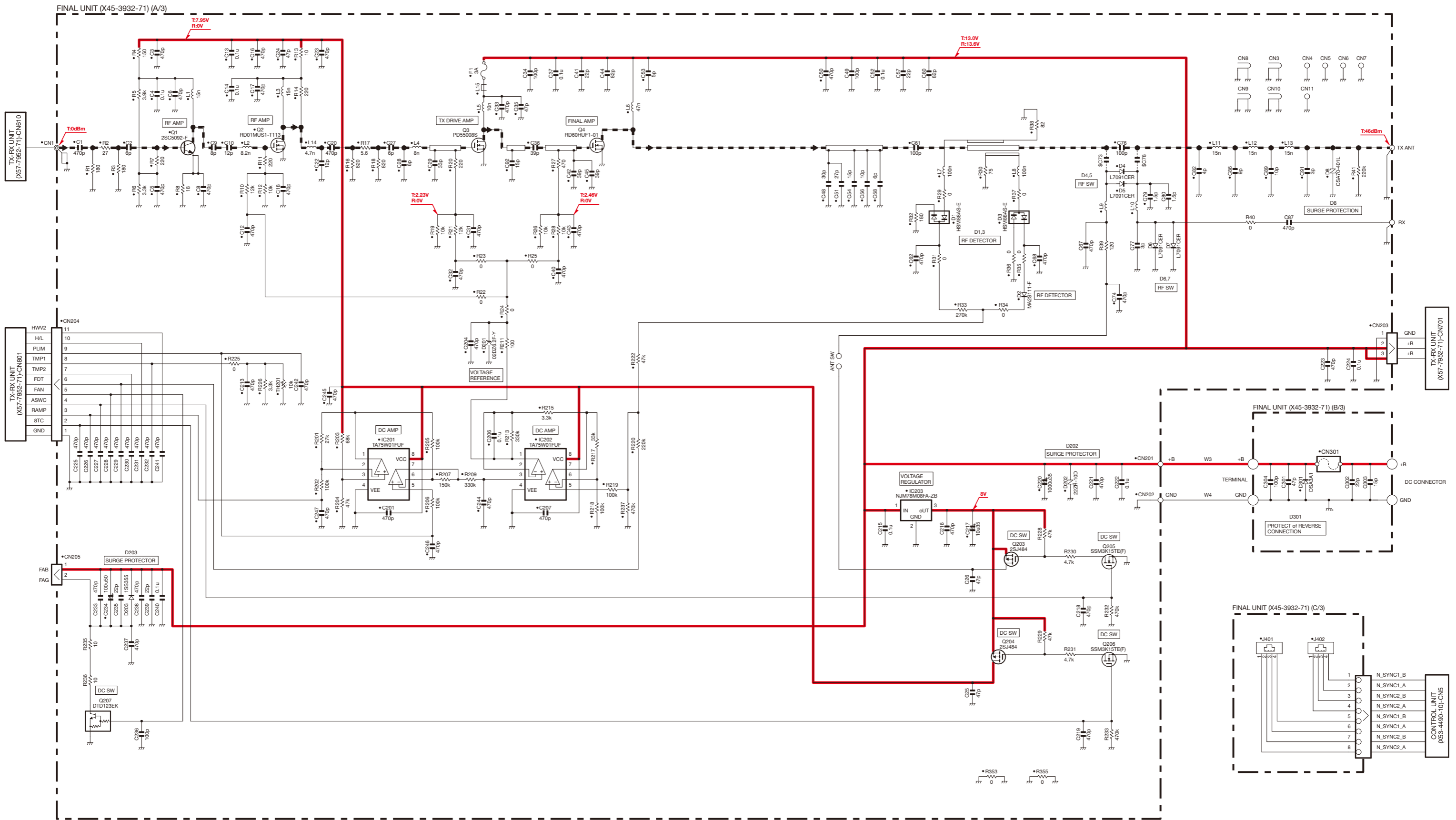
**TX VCO/PLL UNIT (X58-5100-10)  
Component side view (J79-0270-09)**

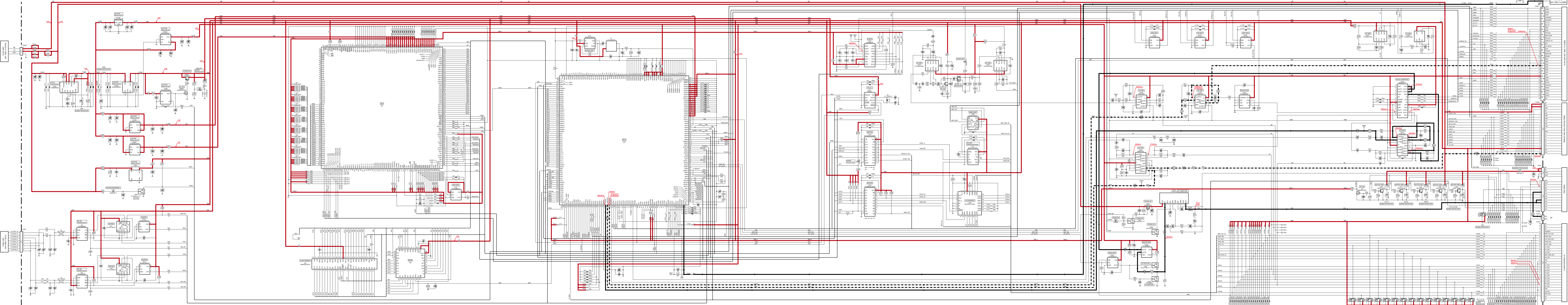
**TX VCO/PLL UNIT (X58-5100-10)  
Foil side view (J79-0270-09)**



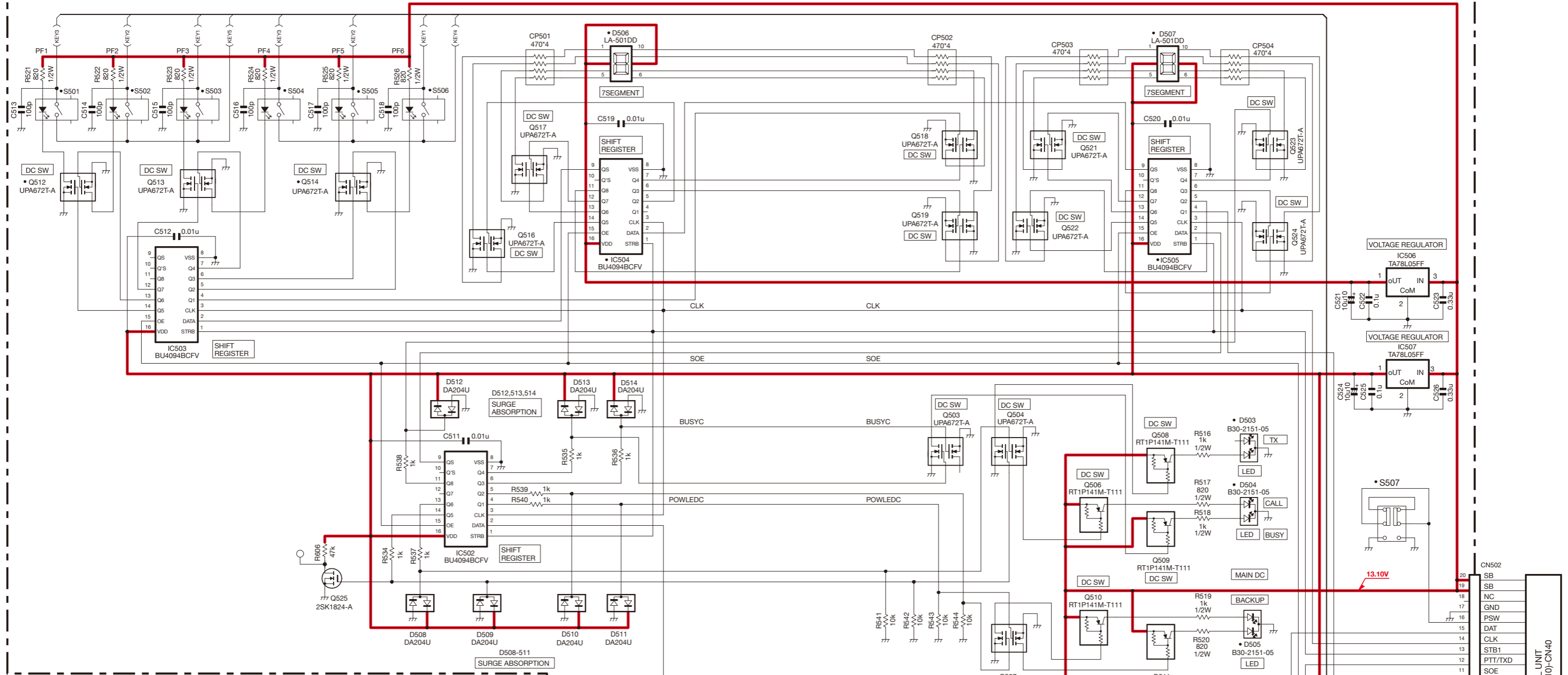
Ref. No.	Address
IC300	5G
Q300	3F
Q350	12G
Q351	12F
Q352	9H
Q353	9G
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D353	11F
D355	10G
D357	10F
D358	10H
D359	10H
D360	10F
D361	10G



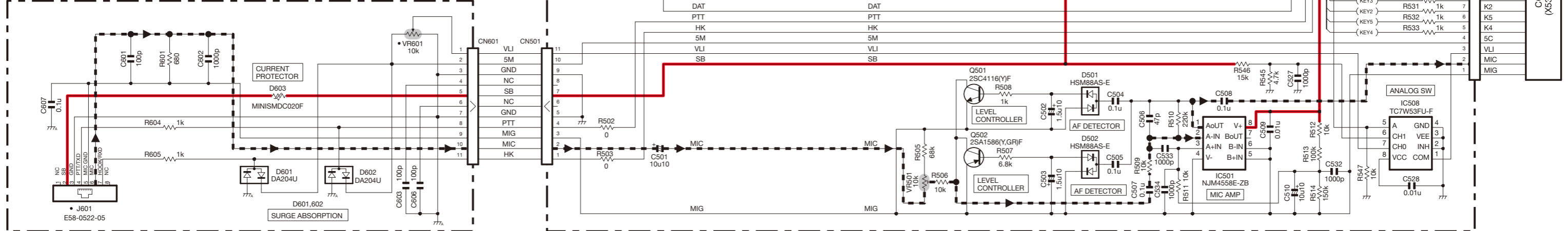


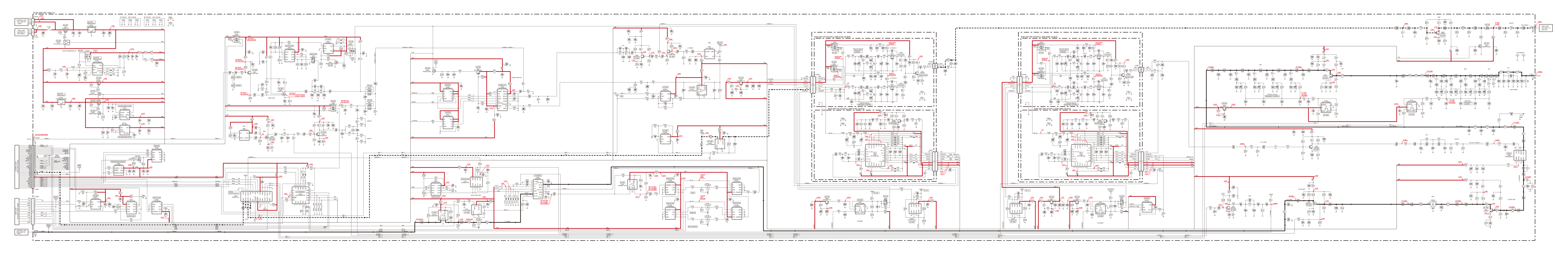


DISPLAY UNIT (X54-3730-20) (A/2)



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





- A : N09-2292-05
- B : N30-2606-48
- C : N30-4006-48
- D : N30-4014-48
- E : N30-4020-43
- F : N32-3006-48
- G : N32-4008-43
- H : N35-3006-43
- J : N35-4006-43
- K : N67-3008-48
- L : N80-2608-43
- M : N87-3005-43
- N : N87-3006-48

