

# TK-5910(B)

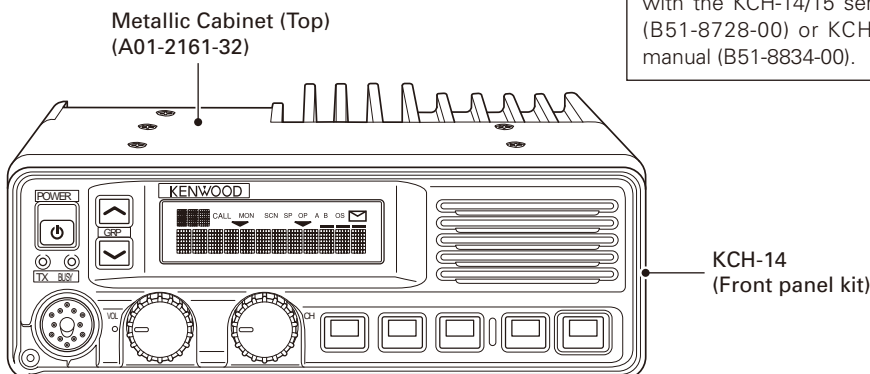
## SERVICE MANUAL

# KENWOOD

Kenwood Corporation

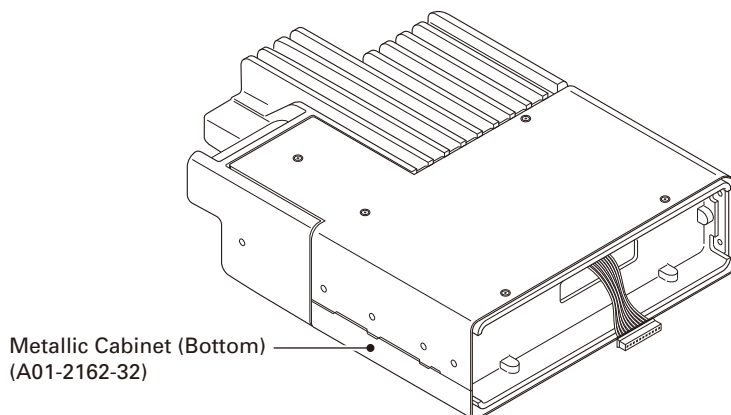
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B51-8904-00 (N) 392

### TK-5910(B) with KCH-14



Use this service manual together with the KCH-14/15 service manual (B51-8728-00) or KCH-16 service manual (B51-8834-00).

### TK-5910(B)



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Transceivers containing AMBE+2™ Vocoder:

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

# GENERAL

## INTRODUCTION

### SCOPE OF THIS MANUAL

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

### ORDERING REPLACEMENT PARTS

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

### PERSONAL SAFETY

The following precautions are recommended for personal safety:

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

## PRE-INSTALLATION CONSIDERATIONS

### 1. UNPACKING

Unpack the radio from its shipping container and check for accessory items. If any item is missing, please contact KENWOOD immediately.

### 2. LICENSING REQUIREMENTS

Federal regulations require a station license for each radio installation (mobile or base) be obtained by the equipment owner. The licensee is responsible for ensuring transmitter power, frequency, and deviation are within the limits permitted by the station license.

Transmitter adjustments may be performed only by a licensed technician holding an FCC first, second or general class commercial radiotelephone operator's license. There is no license required to install or operate the radio.

### 3. PRE-INSTALLATION CHECKOUT

#### 3-1. Introduction

Each radio is adjusted and tested before shipment. However, it is recommended that receiver and transmitter operation be checked for proper operation before installation.

#### 3-2. Testing

The radio should be tested complete with all cabling and accessories as they will be connected in the final installation. Transmitter frequency, deviation, and power output should be checked, as should receiver sensitivity, squelch operation, and audio output. Signaling equipment operation should be verified.

## GENERAL

### 4. PLANNING THE INSTALLATION

#### 4-1. General

Inspect the vehicle and determine how and where the radio antenna and accessories will be mounted.

Plan cable runs for protection against pinching or crushing wiring, and radio installation to prevent overheating.

#### 4-2. Antenna

The favored location for an antenna is in the center of a large, flat conductive area, usually at the roof center. The trunk lid is preferred, bond the trunk lid and vehicle chassis using ground straps to ensure the lid is at chassis ground.

#### 4-3. Radio

The universal mount bracket allows the radio to be mounted in a variety of ways. Be sure the mounting surface is adequate to support the radio's weight. Allow sufficient space around the radio for air cooling. Position the radio close enough to the vehicle operator to permit easy access to the controls when driving.

#### 4-4. DC Power and wiring

1. This radio may be installed in negative ground electrical systems only. Reverse polarity will cause the cable fuse to blow. Check the vehicle ground polarity before installation to prevent wasted time and effort.
2. Connect the positive power lead directly to the vehicle battery positive terminal. Connecting the Positive lead to any other positive voltage source in the vehicle is not recommended.
3. Connect the ground lead directly to the battery negative terminal.
4. The cable provided with the radio is sufficient to handle the maximum radio current demand. If the cable must be extended, be sure the additional wire is sufficient for the current to be carried and length of the added lead.

### 5. INSTALLATION PLANNING – CONTROL STATIONS

#### 5-1. Antenna system

Control station. The antenna system selection depends on many factors and is beyond the scope of this manual. Your KENWOOD dealer can help you select an antenna system that will best serve your particular needs.

#### 5-2. Radio location

Select a convenient location for your control station radio which is as close as practical to the antenna cable entry point. Secondly, use your system's power supply (which supplies the voltage and current required for your system). Make sure sufficient air can flow around the radio and power supply to allow adequate cooling.

## SERVICE

This radio is designed for easy servicing. Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained in this manual.

## NOTE

You must use KPG-95D version 6.00 or later for this transceiver. KPG-95D versions earlier than version 6.00 will not work properly.

# TK-5910(B)

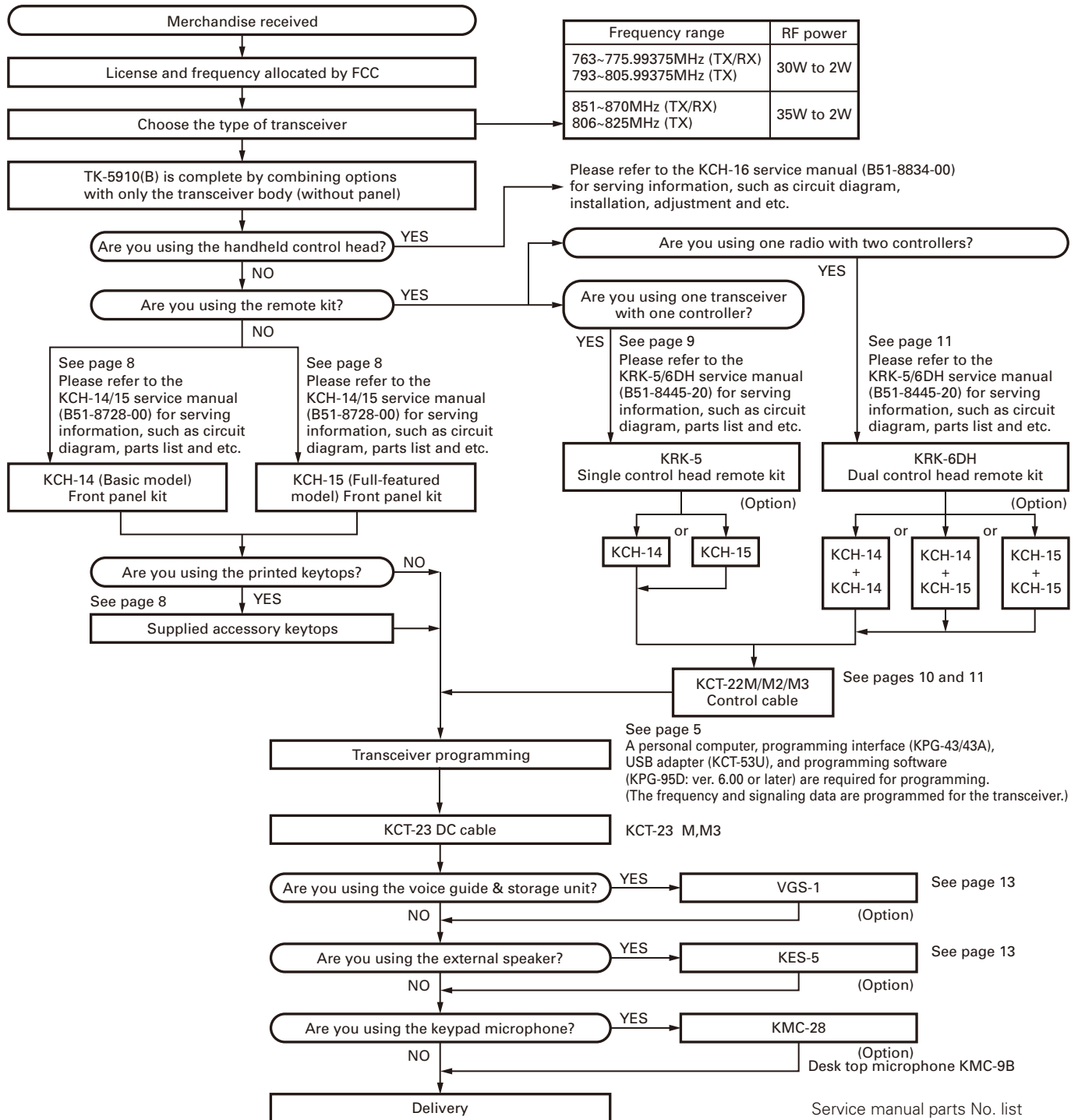
## SYSTEM SET-UP

### Before Reading About System Set-up

*The TK-5910(B) is a transceiver main unit (without a panel or speaker) that you complete by adding options.*

The options are classified into three types according to operation and function.

1. Install the front panel kit (controller) directly on a radio to operate it. (Form: Radio + KCH-14/15)
2. Remotely control one radio with one controller. (Form: Radio + KRK-5 + KCH-14/15 + KCT-22M/M2/M3)
3. Remotely control one radio with two controllers. (Form: Radio + KRK-6DH + KCH-14/15 (two) + KCT-22M/M2/M3 (two))

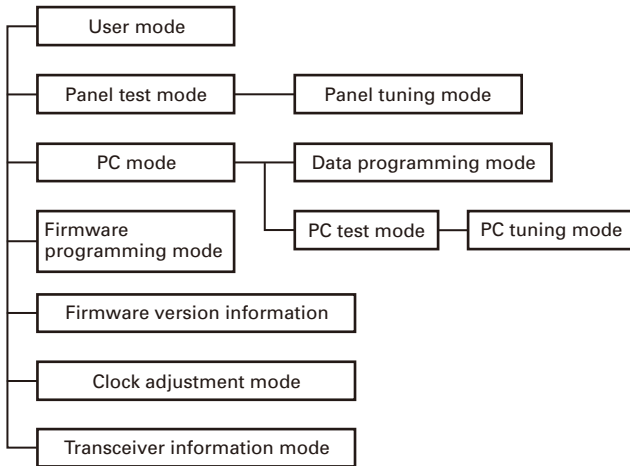


Service manual parts No. list

Model	Parts No.
KRK-5/6DH	B51-8445-20
KCH-14/15	B51-8728-00
KCH-16	B51-8834-00

## REALIGNMENT

### 1. Modes



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

### 2. How to Enter Each Mode

Mode	Operation
User mode	Power ON
Panel test mode	[PF1] + Power ON
PC mode	Received commands from PC
Panel tuning mode	[Panel test mode] + [GRP ^]
Firmware programming mode	[PF2] + Power ON
Firmware version information	[PF3] + Power ON
Clock adjustment mode	[PF4] + Power ON
Transceiver information mode	[PF1] + [PF3] + Power ON

### 3. Panel Test Mode

Setting method refer to ADJUSTMENT.

### 4. Panel Tuning Mode

Setting method refer to ADJUSTMENT.

### 5. PC Mode

#### 5-1. Preface

The transceiver is programmed by using a personal computer, programming interface (KPG-43/43A), USB adapter (KCT-53U) and programming software (KPG-95D: ver. 6.00 or later).

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

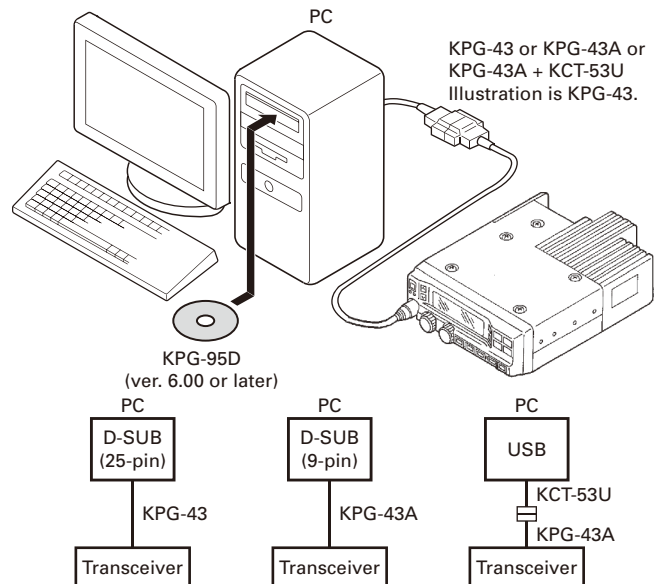


Fig. 1

## REALIGNMENT

### 5-2. Connection procedure

1. Connect the transceiver to the computer using the interface cable and USB adapter (When the interface cable is KPG-43A, the KCT-53U can be used.).

#### Note:

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

2. When the POWER switch on, user mode can be entered immediately. When PC sends command the transceiver enter PC mode, and "PROGRAM" is displayed on the LCD. When data transmitting from transceiver, the red LED is lights. When data receiving to transceiver, the green LED is lights.

#### Note:

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

### 5-3. KPG-43/KPG-43A description

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

The KPG-43/43A is required to interface the transceiver to the computer. It has a circuit in its D-sub connector (KPG-43: 25-pin, KPG-43A: 9-pin) case that converts the RS-232C logic level to the CMOS level.

The KPG-43/43A connects the microphone jack of the transceiver to the RS-232C serial port of the computer.

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

The KCT-53U is a cable which connects the KPG-43A to a USB port on a computer.

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

### 5-5. Programming software KPG-95D description

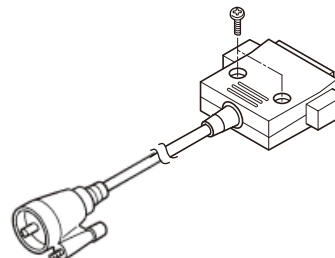
The KPG-95D (ver. 6.00 or later) is the programming software for the transceiver supplied on a CD-ROM. This software runs under MS-Windows 98, ME, Windows NT4.0, 2000, XP or Vista (32-bit) on a PC.

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

### 6. PC Tuning Mode

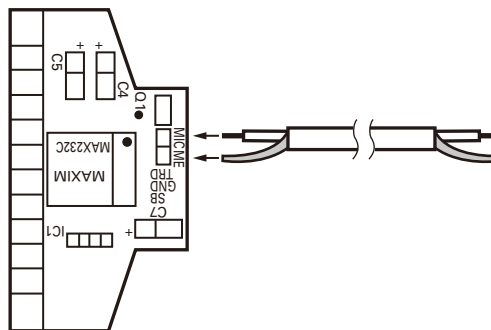
When making adjustment while in PC tuning mode, modify the KPG-43/43A programming interface cable as described below.

1. Remove the two screws from the plug cover, then lift the cover from the plug.

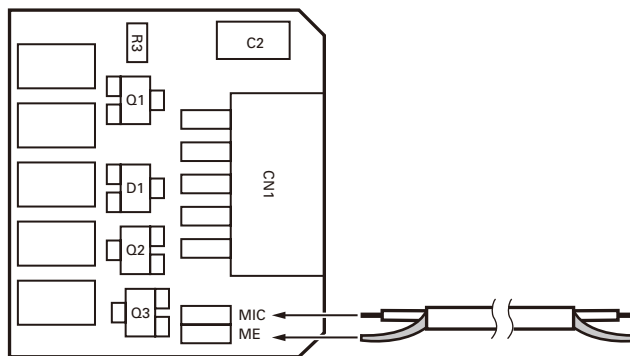


2. Solder the lead wire onto the MIC tab on the PCB, and the ground wire onto the ME tab.

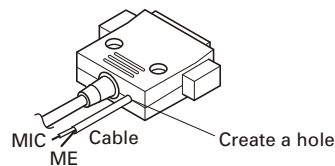
- KPG-43



- KPG-43A

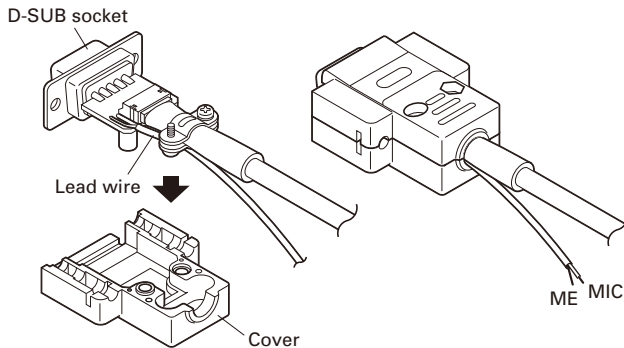


3.
  - KPG-43
  - Create a hole in the casing (as shown in the illustration) then fit the cable into the hole. Replace the cover and secure it using the two screws.



## REALIGNMENT

- KPG-43A  
Install the D-SUB socket into the cover after aligning the lead wire as shown in the figure.  
Replace the cover and secure it using the two screws.



## 7. Firmware Programming Mode

### 7-1. Preface

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

### 7-2. Connection procedure

Connect the transceiver to the personal computer (PC) using the interface cable (KPG-43/43A) and USB adapter (KCT-53U: When the interface cable is KPG-43A, the KCT-53U can be used.). (Connection is the same as in the PC Mode.)

### 7-3. Programming

1. Start up the firmware programming software (Fpro.exe).
2. Set the communications speed (normally, 115200 bps) and communications port in the configuration item.
3. Set the firmware to be updated by File name item.
4. Press and hold the [PF2] key while turning the transceiver power ON. Then, the orange LED on the transceiver lights and "PROGRAM FIRM" is displayed.
5. Check the connection between the transceiver and the personal computer, and make sure that the transceiver is in the Program mode.
6. Press "write" button in the window. When the transceiver starts to receive data, the [PG] display is blinking.
7. If writing ends successfully, the checksum is calculated and a result is displayed.
8. If you want to continue programming other transceivers, repeat steps 4 to 7.

#### Note:

- This mode cannot be entered if the Firmware Programming mode is set to Disable in the Programming software.
- These transceivers use firmware versions G5.00 or later. When using firmware versions earlier than version G5.00, a "Check connection" error message will appear on the LCD. Firmware versions earlier than version G5.00 will not write to the transceiver.

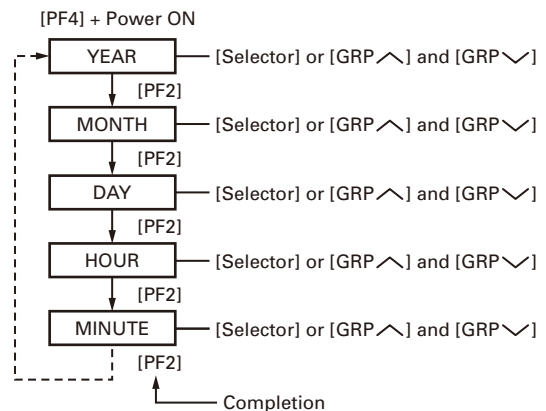
- While the firmware is being written, if the transceiver resets due to a power supply interruption or other problem, the LCD may not display correctly (for example, "PROGRAM FIRM" may not display).  
Additionally, transceiver keys other than the power switch cannot be operated.  
To return to normal operation, click the "Cancel" button in the firmware programming software, then turn the transceiver power OFF and back ON. "PROGRAM FIRM" reappears on the display and the transceiver keys can be operated. However, the previously written firmware data is lost; you must write the firmware using the firmware programming software again.

## 8. Firmware Version Information

Press and hold the [PF3] key while turning the transceiver power ON and then keep pressing and holding the [PF3] key, the firmware version information appears on the LCD.

## 9. Clock Adjustment Mode

### 9-1. Flow chart of operation



## 10. Transceiver Information Mode

Use this function to confirm the transceiver firmware version.

1. Press and hold the [PF1] and [PF3] keys while turning the transceiver power ON.
2. The transceiver firmware version appears on the LCD.
3. To exit the transceiver information mode, turn the transceiver power OFF.

## INSTALLATION

### 1. Front Panel Kit (KCH-14/15: Option)

#### 1-1. Installing the KCH-14/15 front panel kit to the transceiver

1. Remove the upper case and lower case of the transceiver.
2. Insert the lead wire with connector (W700) of the control unit (X53-440) into the connector (CN1) of the KCH-14 or KCH-15.
3. Install the KCH-14 or KCH-15 on the transceiver using the four screws ① supplied with the front panel kit.

**Note:**

Take care that the lead wire with connector (W700) is not caught when fitting the KCH-14 or KCH-15 on the transceiver. (You can install the panel upside down if necessary to install the transceiver.)

4. Affixing the sheet (G11-4379-04) for the waterproof (Fig.1-1-2).
  - (1) Remove the covering paper of the sheet ②.
  - (2) Affix the sheet while taking note of the position of the three parts as shown in Fig.1-1-2 ③.

Firmly affix the sheet to the chassis by pushing the double-coated tape with your fingers.
- (3) Repeat step (2) to affix the sheet to the other side of chassis.

**Note:**

The sheet cannot be reused. Affix a new sheet when you removed the sheet.

5. Reassemble the upper case and lower case. (Refer to page 18)

**Note:**

Take care that the sheet (G11-4379-04) is not peeled off when installing the upper/lower case.

6. Connect the short plug to the accessory connector (9-pin) on the rear of the transceiver.

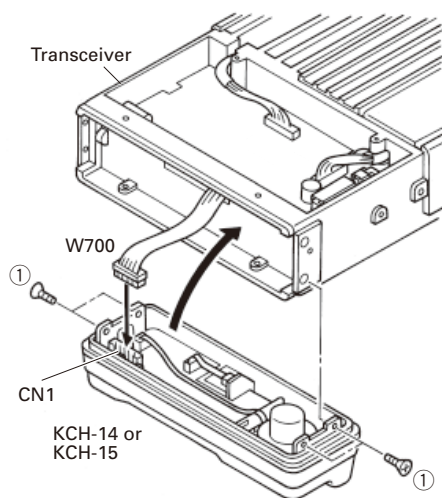
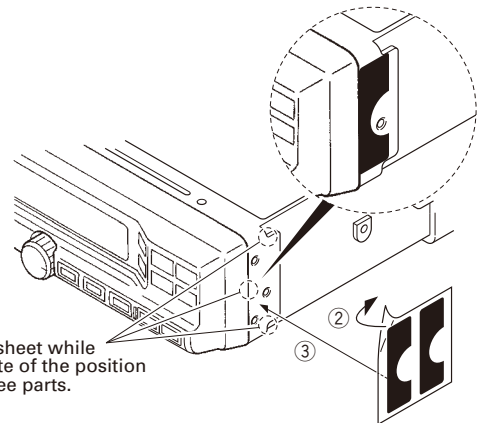


Fig. 1-1-1



Affix the sheet while taking note of the position of the three parts.

Fig. 1-1-2

#### 1-2. Installing the accessory keytops to the front panel kit

When a function is set by the programming software (KPG-95D), the key legend can be changed by inserting the accessory keytops into PF1 to PF9 of the KCH-15 (PF1 to PF5: KCH-14). The accessory contains 60 keytops as shown the table below.

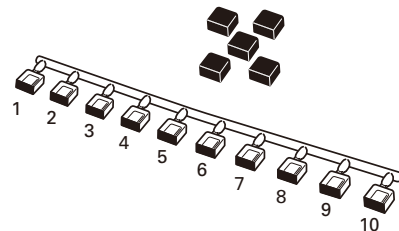


Fig. 1-2

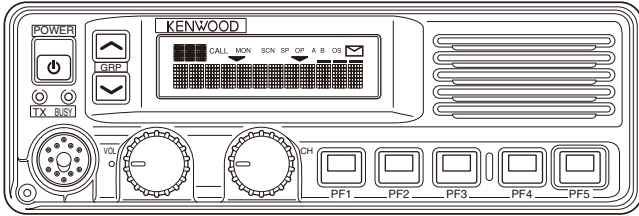
No.	K29-5276-03	K29-5277-03	K29-5305-03
1	AN	RCL	CH1
2	D/A	RPT	CH2
3	DIM	SCN	CH3
4	HA	SP	CH4
5	HC	SPM	CH5
6	IC	SQ	AUX A
7	MON	TA	AUX B
8	OPT	∧	AUX C
9	OST	∨	EMG
10	PA	No printing	■

No.	K29-9353-13	K29-9354-13	K29-9356-03
1	2TN	GPS	PAG
2	AD	STS	SIT
3	AR	TAC	SRC
4	CLK	TON	No printing
5	FNC	RES	No printing
6	PBK	IDV	No printing
7	SCP	KDL	No printing
8	SEC	TGR	No printing
9	SEL	RGP	No printing
10	SES	No printing	No printing



## INSTALLATION

### KCH-14



### KCH-15

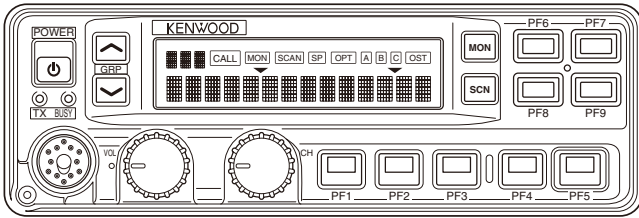


Fig. 1-3

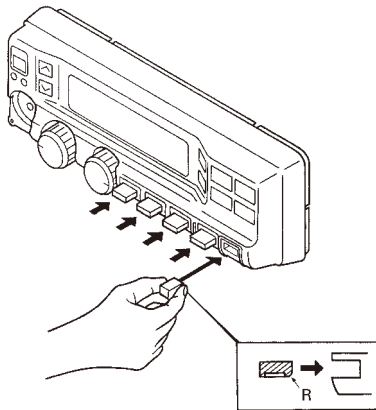


Fig. 1-4 Keytop insertion

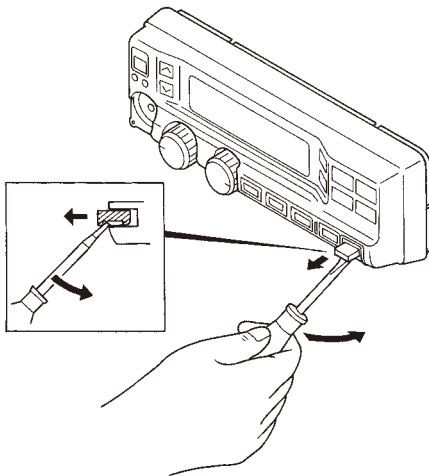


Fig. 1-5 Keytop removal

## 2. Remote kit (KRK-5: Option)

The KRK-5 remote kit is used to remotely operate the transceiver. The KRK-5 is connected to the KCH-14 or KCH-15 with an optional KCT-22M (8 feet), KCT-22M2 (17 feet), or KCT-22M3 (25 feet) control cable.

### 2-1. Installing the KRK-5 main panel onto the transceiver

1. Remove the upper case and lower case of the transceiver.
2. Insert the lead wire with connector (W700) of the control unit (X53-440) into the connector (CN4) of the KRK-5.
3. Install the KRK-5 main panel on the transceiver using four screws ①.

#### Note:

Take care that the lead wire with connector (W700) is not caught when fitting the KRK-5 main panel on the transceiver.

4. Affixing the sheet (G11-4379-04) for the waterproof (Fig.2-1-2).

- (1) Remove the covering paper of the sheet ②.
- (2) Affix the sheet while taking note of the position of the three parts as shown in Fig.2-1-2 ③.

Firmly affix the sheet to the chassis by pushing the double-coated tape with your fingers.

- (3) Repeat step (2) to affix the sheet to the other side of chassis.

#### Note:

The sheet cannot be reused. Affix a new sheet when you removed the sheet.

5. Reassemble the upper case and lower case of the transceiver. (Refer to page 18)

#### Note:

Take care that the sheet (G11-4379-04) is not peeled off when installing the upper/lower case.

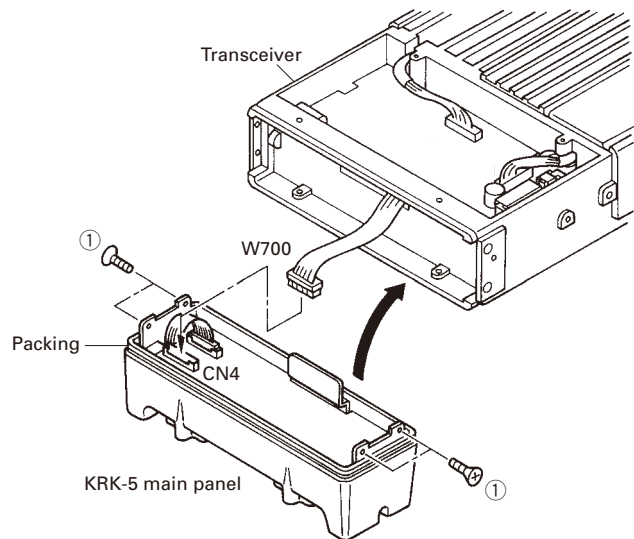


Fig. 2-1-1

## INSTALLATION

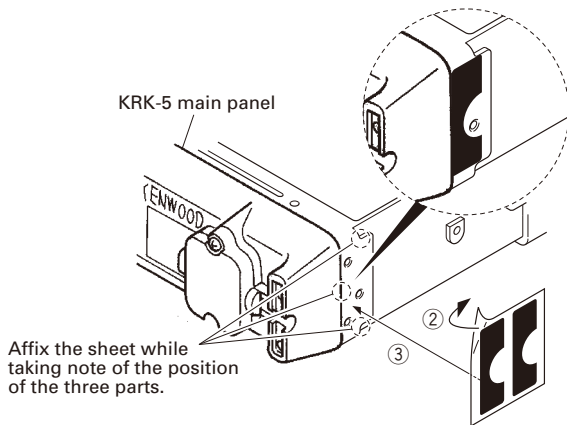


Fig. 2-1-2

### 2-2. Installing the KRK-5 rear panel onto the front panel kit

The following steps apply to both the KCH-14 and KCH-15.

1. Remove three screws ① on the KRK-5 rear panel, then remove the KRK-5 sub panel.
2. Insert the lead wire with connector (W102) of the KRK-5 into the connector (CN1) of the front panel kit ②.
3. Insert the lead wire with connector (W103) of the KRK-5 into the connector (CN3) of the front panel kit ③.
4. Make a slight cut in the end of the rubber cap ④.
5. Slide the lead wire of the connector wiring ⑤ through the slit in the rubber cap ⑥.
6. Insert the rubber cap into the hole of the KRK-5 rear panel ⑦.
7. Insert the connector ⑧ to the ACC connector ⑨ on the KRK-5 sub panel as shown by the arrow ⑩.
8. Install the KRK-5 sub panel onto the sub panel of the front panel kit ⑪.
9. Install the KRK-5 sub panel to the sub panel of the front panel kit using four screws ⑫.
10. Reinstall the KRK-5 rear panel using three screws removed in step 1.
11. Use a wire band to secure the lead wire at the end of the rubber cap ⑬.

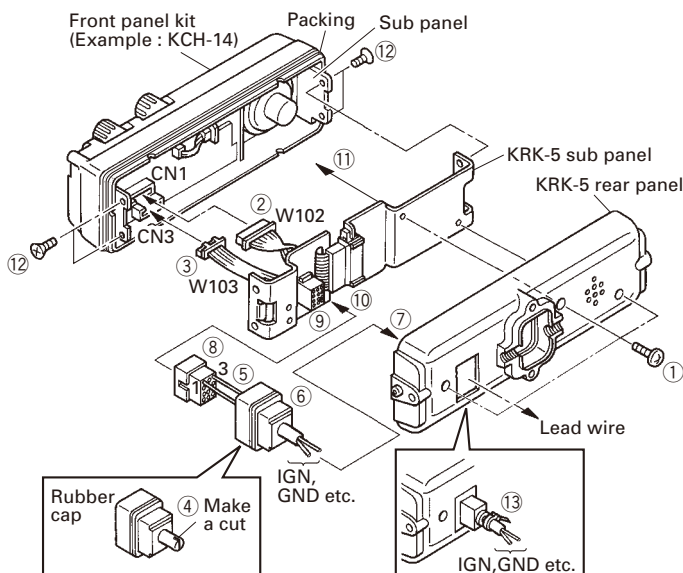


Fig. 2-2

### 2-3. Control cable (KCT-22) connection (Fig. 2-3)

1. Insert one connector of the control cable to the transceiver (with KRK-5) and the other to the display. Connect the cable to the GND terminal with the screw ① supplied with the control cable.
2. Secure the one connector of the control cable to the KRK-5 main panel with two screws ② according to the installation condition of the transceiver. Secure the control cable to the KRK-5 main panel with the cable fitting (J21-4354-04) and two screws ③ supplied with the KRK-5.
3. Secure the other connector of the control cable to the display with two screws ④ in the same way.

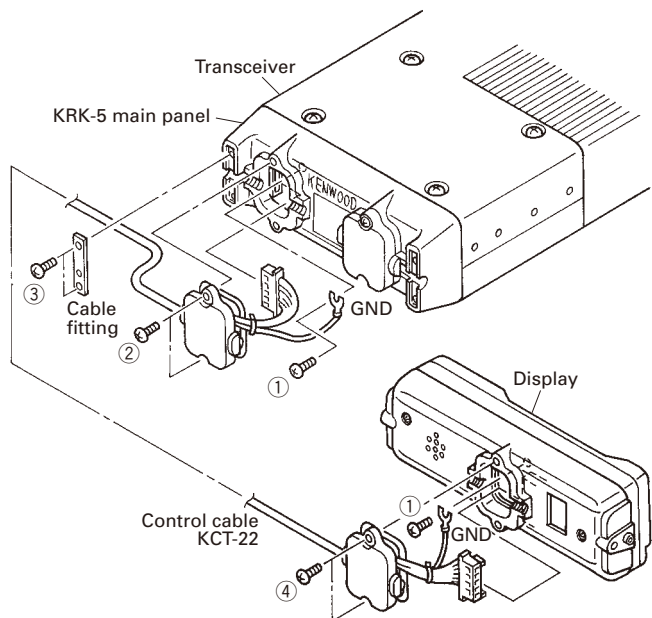


Fig. 2-3

### 2-4. Display installation (Fig. 2-4)

1. Install the display with the angle bracket (J29-0648-03) ① and two screws (N08-0526-04) ② supplied with the KRK-5.

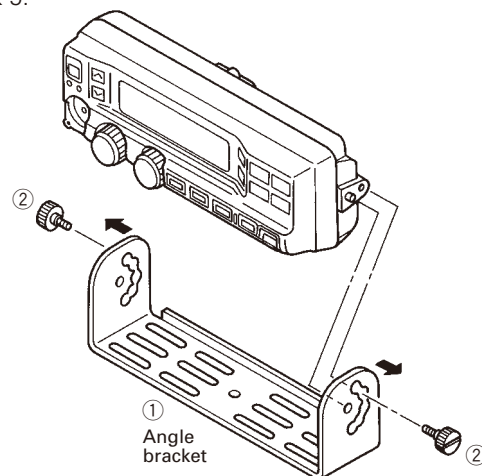


Fig. 2-4

## INSTALLATION

### 3. Dual Control Head Remote Kit (KRK-6DH: Option)

The KRK-6DH remote kit connects two displays (two KCH-14s or KCH-15s) to the transceiver. The KRK-6DH is connected to the KCH-14s or KCH-15s with two optional control cables. There are three version of the control cable: KCT-22M (8 feet), KCT-22M2 (17 feet), and KCT-22M3 (25 feet).

#### 3-1. Installing the KRK-6DH main panel onto the transceiver

1. Remove the upper case and lower case of the transceiver.
2. Insert the lead wire with connector (W700) of the control unit (X53-440) into the connector (CN4) of the KRK-6DH. Insert the lead wire with connector (W104) of the KRK-6DH into the connector (CN503) of the transceiver.
3. Install the KRK-6DH main panel on the transceiver using four screws ①.

#### Note:

Take care that the lead wire with connector (W700) is not caught when fitting the KRK-6DH main panel on the transceiver.

4. Affixing the sheet (G11-4379-04) for the waterproof (Fig.3-1-2).
  - (1) Remove the covering paper of the sheet ②.
  - (2) Affix the sheet while taking note of the position of the three parts as shown in Fig.3-1-2 ③.  
Firmly affix the sheet to the chassis by pushing the double-coated tape with your fingers.
  - (3) Repeat step (2) to affix the sheet to the other side of chassis.

#### Note:

The sheet cannot be reused. Affix a new sheet when you removed the sheet.

5. Reassemble the upper case and lower case of the transceiver. (Refer to page 18)

#### Note:

Take care that the sheet (G11-4379-04) is not peeled off when installing the upper/lower case.

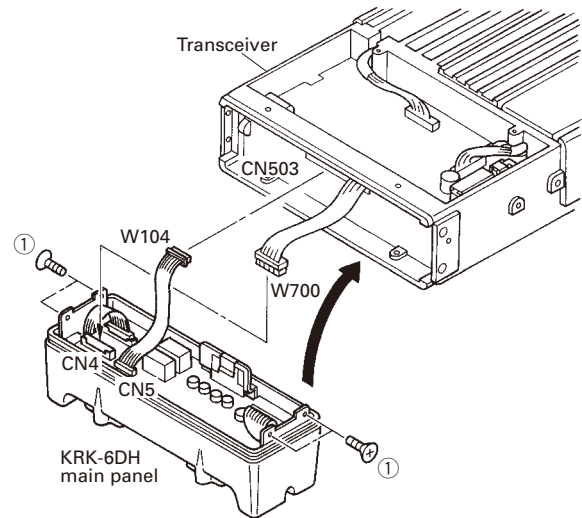


Fig. 3-1-1

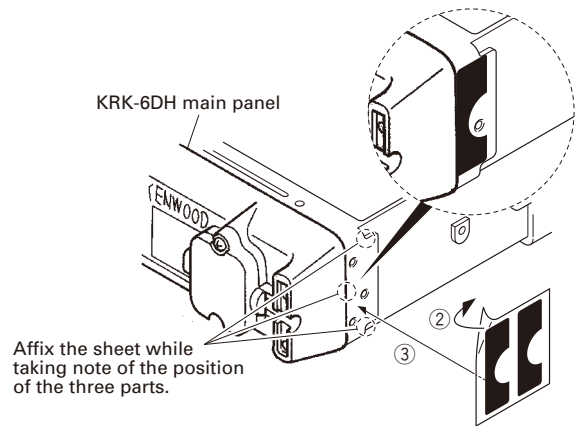


Fig. 3-1-2

#### 3-2. Installing two KRK-6DH rear panels onto two front panel kits

Install each KRK-6DH rear panel onto each front panel kit as same as "2-2. Install the KRK-5 rear panel onto the front panel kit" described on page 10.

#### 3-3. Control cable (KCT-22) connection (Fig. 3-2)

1. Use two control cables. Insert one connector of the one control cable to the transceiver (with KRK-6DH) and the other to the display 1.  
Insert one connector of the other control cable to the transceiver (with KRK-6DH) and the other to the display 2. Connect each cable to the GND terminal with the screws ① supplied with each control cable.
2. Secure the one connector of each control cable to the KRK-6DH main panel with two screws ② according to the installation condition of the transceiver. Pass the control cables through the grooves at both ends of the KRK-6DH main panel and secure the control cables to the KRK-6DH with the cable fitting (J21-4354-04) and two screws ③ supplied with the KRK-6DH.
3. Secure the other connectors of the control cables to the display 1 and display 2 with two screws ④ in the same way.

## INSTALLATION

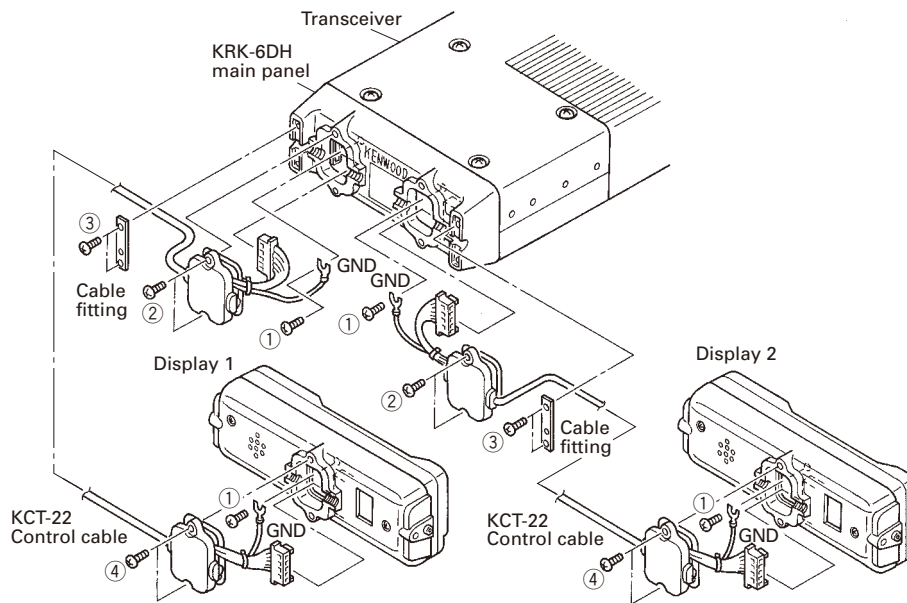


Fig. 3-2

### 4. Ignition Sense Cable (KCT-18: Option)

The KCT-18 is an optional cable to use the following functions:

#### • Ignition function

The ignition function allows you to turn the transceiver's power on and off with the ignition key of your car. When you are driving with the ignition key on, the horn alert function is disabled.

#### • Timed power-off function

The timed power-off function turns the transceiver's power off the time specified with the programming software (KPG-95D) after the ignition key is turned off. When you are driving with the ignition key on, the horn alert function is disabled.

The ignition sense function and the timed power-off function can be used at the same time.

#### 4-1. Connecting the KCT-18 cable to the transceiver

1. Remove the short plug from the accessory connector (9-pin) on the rear of the transceiver.
2. Insert the KCT-18 lead terminal into pin 1 (IGN) of the short plug (9-pin).
3. Connect the short plug to the accessory connector (9-pin) on the rear of the transceiver.

#### Note:

You must setup using the KPG-95D.

#### 4-2. Connecting the KCT-18 cable to the KRK-5/6DH remote kit

1. Remove the square plug from the accessory connector (12-pin) on the rear of the control head.
2. Cut off the end of the rubber cap (accessory), insert the KCT-18 lead terminal into the rubber cap, and insert it into pin 1 (IGN) of the square plug.

3. Connect the square plug and rubber cap to the accessory connector (12-pin) on the rear of the control head, then clamp the bottom of the rubber cap with the supplied tie wrap.

#### Note:

You must setup using the KPG-95D.

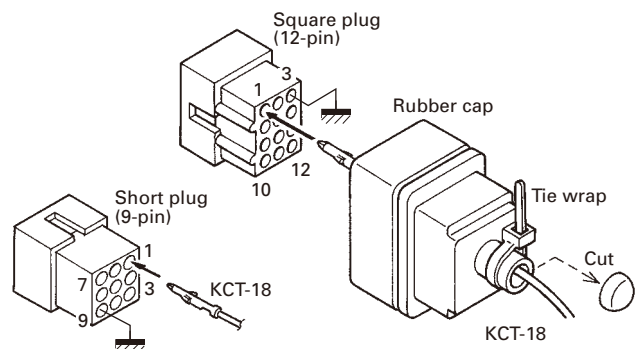


Fig. 4-1

Fig. 4-2

## INSTALLATION

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

#### 5-1. Installing the VGS-1 unit in the transceiver

1. Remove the upper case and upper packing of the transceiver.
2. Attach two cushions to the VGS-1 as shown in figure.

#### Note:

Be sure not to cover the VGS-1 connector (CN1) with the cushion.

3. Insert the VGS-1 connector (CN1) into the control unit connector (CN411).

#### Note:

You must setup using the KPG-95D.

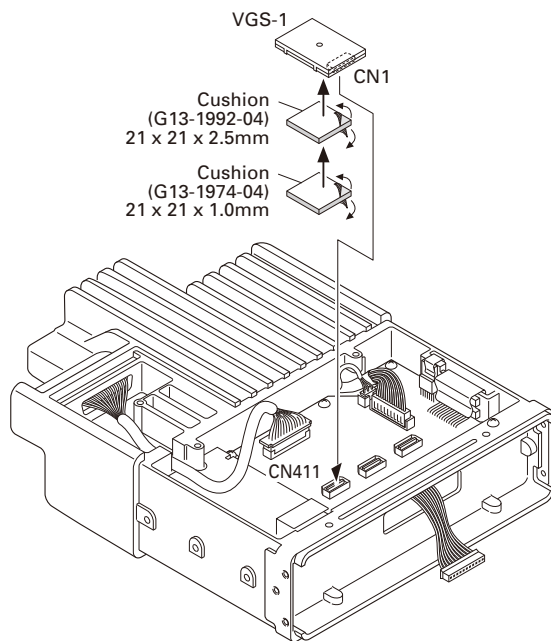


Fig. 5

### 6. External Speaker (KES-5: Option)

The speaker output from the transceiver is as follows:

1. The KCH-14 has a built-in speaker (3W/8 ohms).
2. The KCH-15 does not have a built-in speaker.
3. The external speaker output from the accessory connector (9-pin) on the rear of the transceiver is 13W/4 ohms. Use the KES-5.
4. The speaker output from the accessory connector (12-pin) on the rear of the control head is 2W/4 ohms. If the remote kit (KRK-5, KRK-6DH) is used, use the KES-5.

#### Note:

Since the transceiver uses a BTL audio amplifier, do not ground the speaker output pin.

#### 6-1. Connecting the KES-5 external speaker to the transceiver

- **When taking the AF output from the accessory connector (9-pin) on the rear of the transceiver**

The following tools are required for changing the connector.

#### Extracting tool

The following extracting tool is recommended :  
Molex Inc. Order No.: 11-03-0002

1. Remove the short plug from the accessory connector (9-pin) on the rear of the transceiver (Fig. 6-1-1).  
Note: Save the jumper, which is required when the transceiver is used without the external speaker.
2. Remove the terminals with the jumper from the connector housing holes number 3 and 6 using the extracting tool.

#### Removing the jumper lead (Fig. 6-1-2)

- 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 into 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 2, and the terminal with the black lead into hole number 6 (Fig. 6-1-3).
  4. Connect the short plug to the accessory connector (9-pin) on the rear of the transceiver.

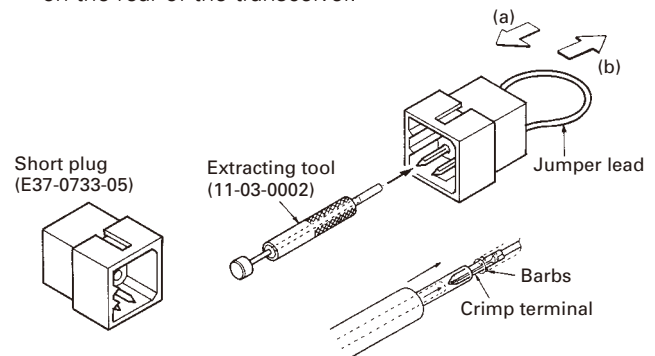


Fig. 6-1-1

Fig. 6-1-2

## INSTALLATION

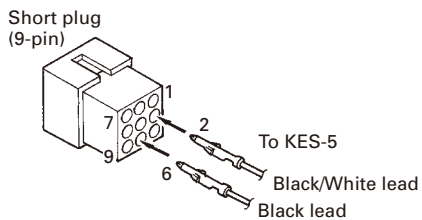


Fig. 6-1-3

### 6-2. Connecting the KES-5 external speaker to the KRK-5/6DH remote kit

- When taking the AF output from the 12-pin accessory connector on the rear of the control head

#### • Modification of plug (12-pin)

1. Remove the square plug from the accessory connector (12-pin) on the rear of the control head.
2. Cut off the end of the rubber cap, insert the KES-5 speaker cable into the cap, and insert it into pins 10 and 11 of the square plug.
3. Connect the square plug and rubber cap to the accessory connector (12-pin) on the rear of the control head, then clamp the bottom of the rubber cap with the supplied tie wrap.

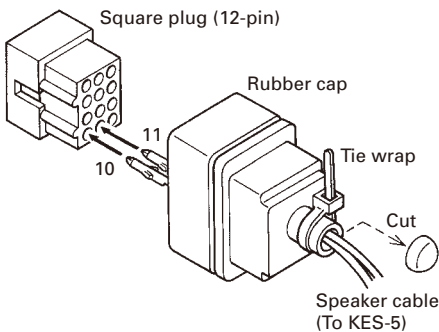


Fig. 6-2-1

- If the KCH-14 is used

If the KES-5 is connected to the 12-pin accessory connector, remove the internal speaker wire.

If the internal speaker is used, remove the wire connected to pins 10 and 11 of the 12-pin accessory connector.

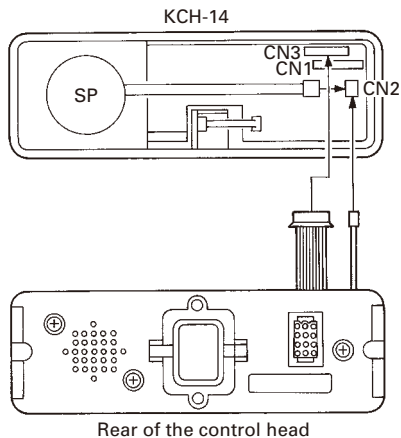


Fig. 6-2-2

### 6-3. Modification to increase the audio output of the control head

The speaker output can be increased to 13W by moving jumper resistor (0 ohm) R74 to \$R73 on the KCH-14 display unit (X54-349 A/3). In this case, the KCH-14 internal speaker cannot be used because the maximum input (3W) of the internal speaker is exceeded. Therefore, use the KES-5.

#### Note:

Even if the KRK-6DH is modified in this way, the audio output of head 2 cannot be increased.

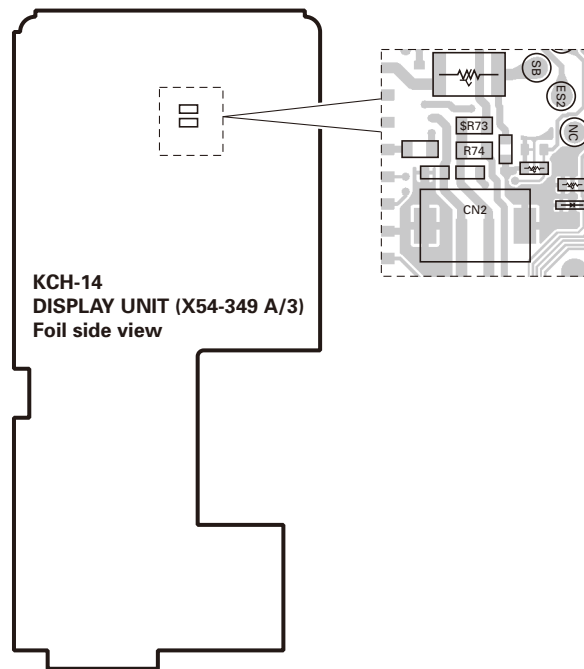


Fig. 6-3

### 6-4. Use as public address speaker

1. Remove the short plug from the 9-pin accessory connector on the rear of the transceiver. (Remove the jumper lead as described in Section 6-1 on page 13.)
2. Insert the KES-5 speaker leads into pins 7 and 8 of the short plug.
3. If you remove jumper shorting pins 3 and 6, the 20W PA (public address) voice signal is output from pins 7 and 8. (Only when the PA or SP switch is on.)
4. If you use the transceiver shorted with pins 3 and 6, the internal speaker is available (when the KCH-14 is used). The KCH-15 does not contain a speaker.

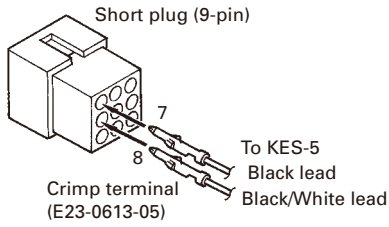
#### Note:

Relationship between accessory connector (9-pin) connection and speaker output.

When pins 3 and 6 are shorted; The 3W internal speaker is used (KCH-14 only).

When pins 3 and 6 are opened and is output from pins 7 and 8; The 20W external speaker is used.

## INSTALLATION



**Fig. 6-4**

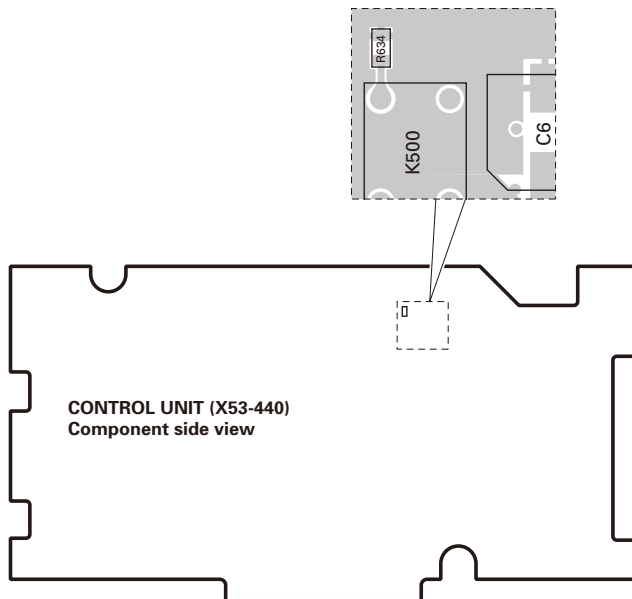
### 7. Horn Alert Function

The HR1 and HR2 pins of the accessory connector (9-pin) on the rear of the transceiver are connected to the relay (K500) and the maximum current is 1A.

1. Remove the upper case of the transceiver.
2. To make the HR2 pin, remove the jumper resistor (0 ohm) R634 on the control unit (X53-440) as shown in Table 1.
3. Reassemble the PC board and the upper case.

	Default	Modification
R634	Present	Absent
State		

**Table 1**



**Fig. 7**

### 8. Handheld control head (KCH-16: Option)

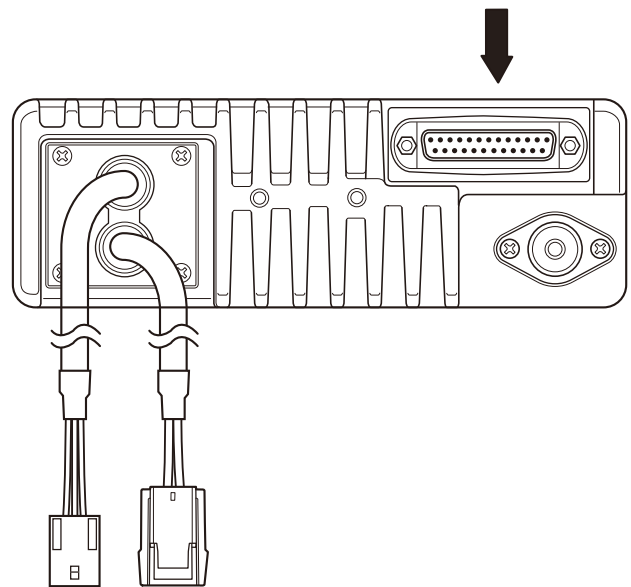
The KCH-16 Handheld control head is used to remotely operate the transceiver.

See the service manual No. B51-8834-00

### 9. AUX D-sub connector

To prevent the D-sub connector cable from detaching from the transceiver D-sub connector, the D-sub connector cable must have a screw-type locking mechanism to allow the use of a screwdriver to lock the D-sub connector.

Never use a D-sub connector with a hand-locking mechanism.



**Fig. 8**

# TK-5910(B)

## DISASSEMBLY FOR REPAIR

### Disassembly Procedure

#### ■ Removing the upper/lower case and shield cover

1. Remove the 9 screws ① and 9 spacers ②.
2. Remove the upper case ③ and lower case ④.
3. Remove the upper packing ⑤ and lower packing ⑥.
4. Remove the shielding plate ⑦.
5. Remove the shielding plate ⑧.

#### ■ Removing the TX-RX unit (X57-761)

1. Remove the 7 screws ⑨ holding the VCO shield cover.
2. Remove the VCO shield cover ⑩.
3. Remove the flat cable from the connector (CN600) of the TX-RX unit ⑫.

4. Remove the 17 screws ⑬.
5. Remove the cables from the connector (CN1) of the control unit ⑭.
6. Remove the 2 screws ⑮ holding the power module.
7. Remove the solder of the power module with a solder absorber.
8. Remove the 2 screws ⑯ holding the + (positive) terminal and - (negative) terminal of the power supply cable.
9. Remove the solder of the antenna receptacle with a solder absorber.

#### Note:

When re-installing the flat cable to the connector on the CN600 side, do not align the cable as shown in the figure 1, as there is a possibility of producing an effect on the sensitivity of P25.

#### Wrong

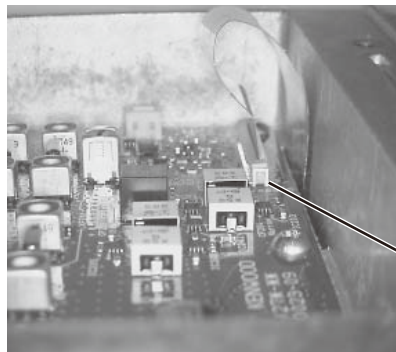


Fig. 1

#### Right

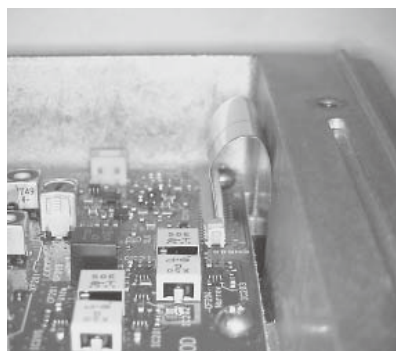
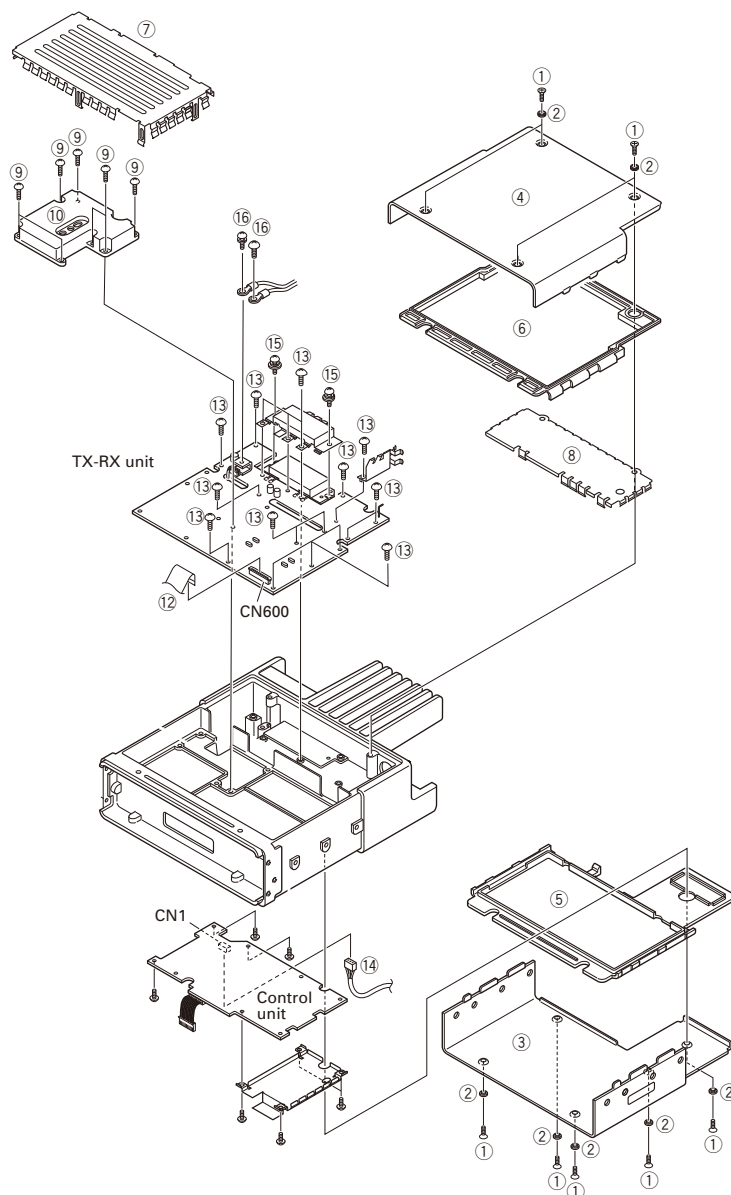


Fig. 2





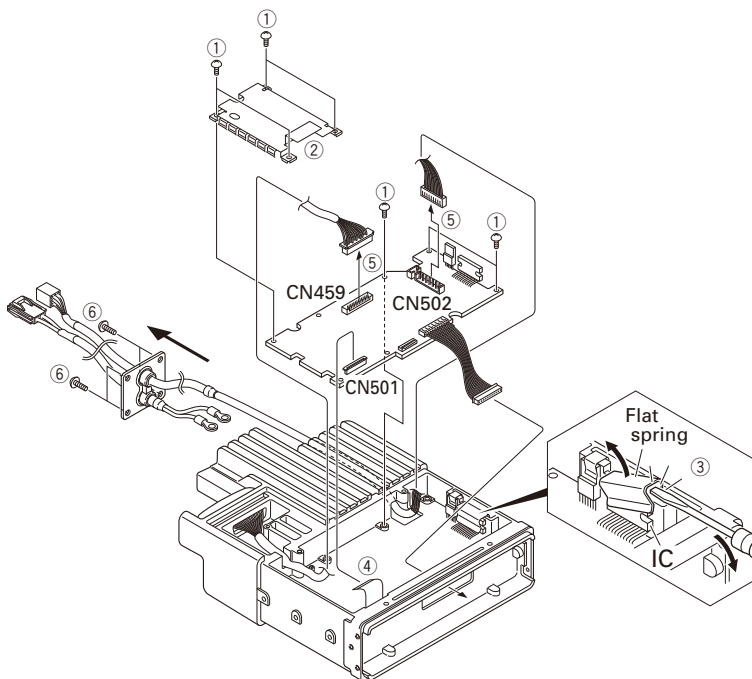
## DISASSEMBLY FOR REPAIR

### ■ Removing the Control unit (X53-440)

1. Remove the 7 screws ①.
2. Remove the shield plate x.
3. With a flat-head screwdriver, remove the ② flat springs holding the ICs (IC5, IC522) ③.
4. Remove the flat cable from the connector (CN501) ④.
5. Remove the cables from the two connectors (CN459, CN502) ⑤.

### ■ Removing the accessory cable and power supply cable on the rear of the transceiver

1. Confirm the following contents.
  - The screws holding the + (positive) terminal and - (negative) terminal of the power supply cable is removed.
  - The cable from the connector (CN502) of the Control unit is removed.
2. Remove the 4 screws ⑥ on the rear of the transceiver.
3. Pull out the power supply cable and accessory cable.



### Precautions for Reassembly

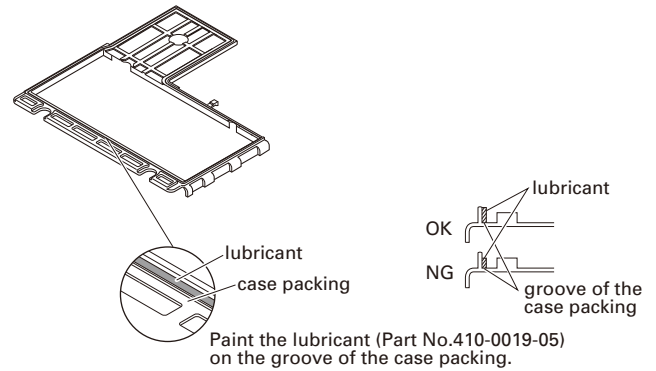
#### ■ Painting the lubricant (Part No.: 410-0019-05) on the groove of the case packing

Paint the lubricant to the position as shown in figure after replacing or assembling the case packing.

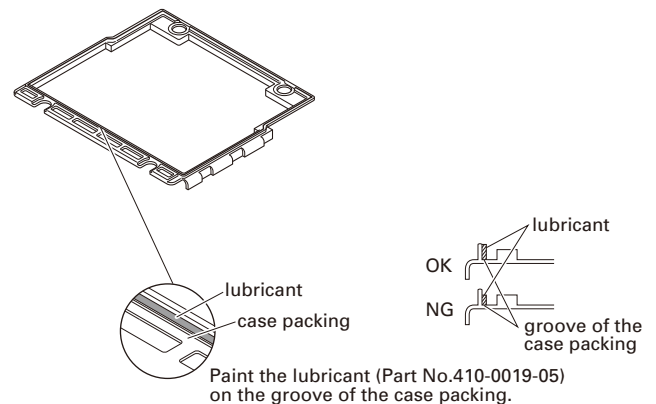
#### Note:

To assure waterproofing, paint the lubricant on the groove of the case packing.

- Case packing (Upper)



- Case packing (Lower)

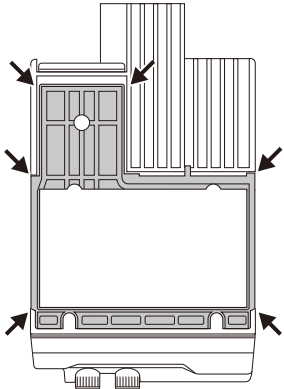


## DISASSEMBLY FOR REPAIR

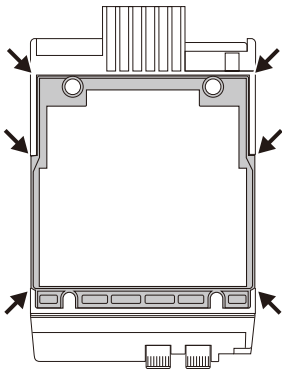
### ■ Procedures after installing the case packing to the chassis

After installing the case packing to the chassis, confirm that all corners of the upper/lower packing are securely fitted to the chassis. Place are shown in the arrow in the figure below.

#### • Case packing (Upper)



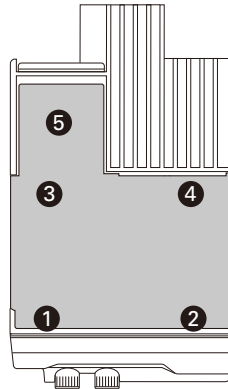
#### • Case packing (Lower)



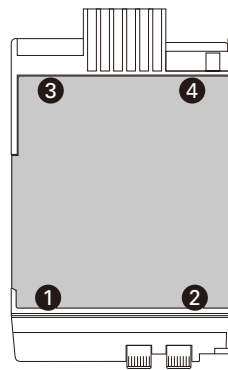
### ■ Sequence of tightening the screws for the upper/lower case to the chassis

Install the upper/lower case to the chassis and tighten the screws in the order shown in the figure below.

#### • Upper case



#### • Lower case



## DISASSEMBLY FOR REPAIR

### ■ Precautions when tightening the screw of the + (positive) terminal of the power supply cable (red) to the +B terminal (CN14)

Tighten the screw using a regulated torque.

#### Note:

Please be careful not to tighten the screw so much that the terminal is warped.

### ■ Attaching the new cushion (G13-2182-04) to the shielding plate

1. Remove the release paper from the new cushion.
2. Attach the cushion as shown in the figure below.

#### Note:

- Ensure you do not overlap the cushion onto the convex part of the shielding plate.
- The cushion cannot be reused. Attach a new cushion when you remove the cushion.

## Installation Procedure during Parts

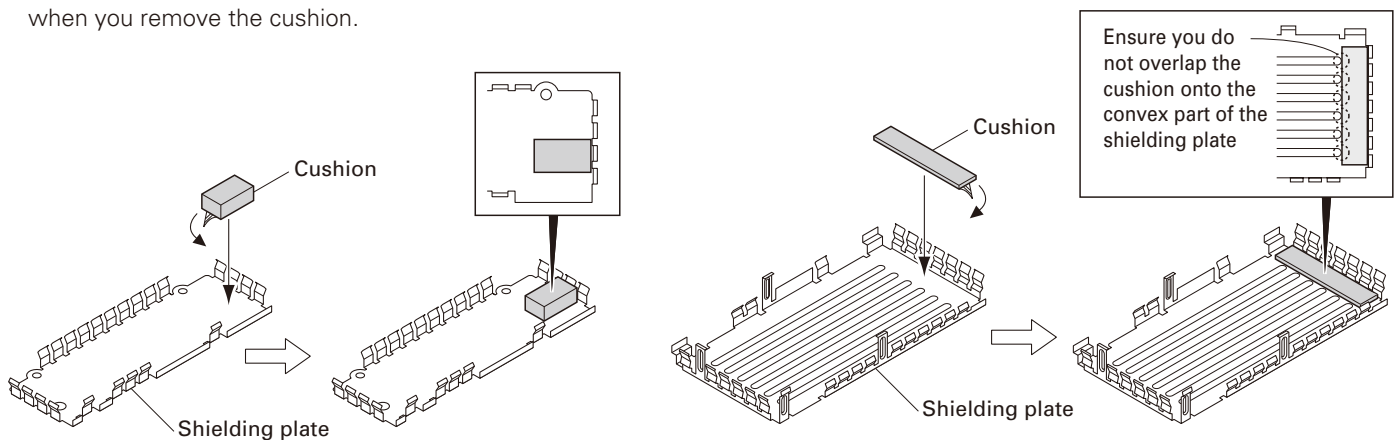
### Replacement

#### ■ Attaching the new cushion (G13-2196-04) to the shielding plate (F10-1479-03)

1. Remove the release paper from the new cushion.
2. Attach the cushion as shown in the figure below.

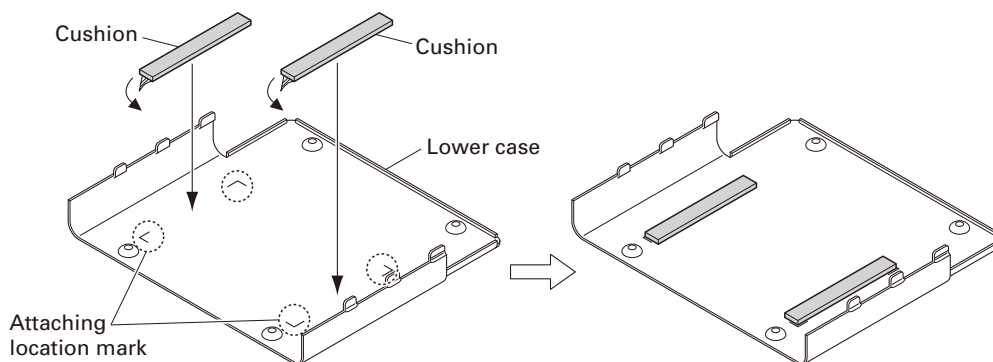
#### Note:

The cushion cannot be reused. Attach a new cushion when you remove the cushion.



#### ■ Attaching the two new cushions (G13-2195-04) to the lower case (A01-2162-32)

1. Remove the release paper from the two new cushions.
2. Attach the two cushions by aligning them with the attaching location marks which are stamped onto the lower case.



## CIRCUIT DESCRIPTION

### 1. Overview

This transceiver is a 700M/800MHz FM & P25 mobile transceiver designed to operate in the frequency range of 763 to 775.99375MHz, 793 to 805.99375MHz (700M) and 806 to 825MHz, 851 to 870MHz (800M).

The unit consists of a receiver, a transmitter, a phase-locked loop (PLL) frequency synthesizer, a digital control unit, power supply circuit.

### 2. Frequency Configuration

The receiver is a double-conversion super heterodyne using first intermediate frequency (IF) of 73.05MHz and second IF of 450kHz. Incoming signals from the antenna are mixed with the local signal from the PLL circuit to produce the first IF of 73.05MHz.

This is then mixed with the 72.6MHz second local signal to produce the 450kHz second IF. This signal is detected to give the demodulated signal in the DSP.

The transmit signal frequency is generated by the PLL VCO, and modulated by the signal from the DSP. It is then amplified and fed to the antenna.

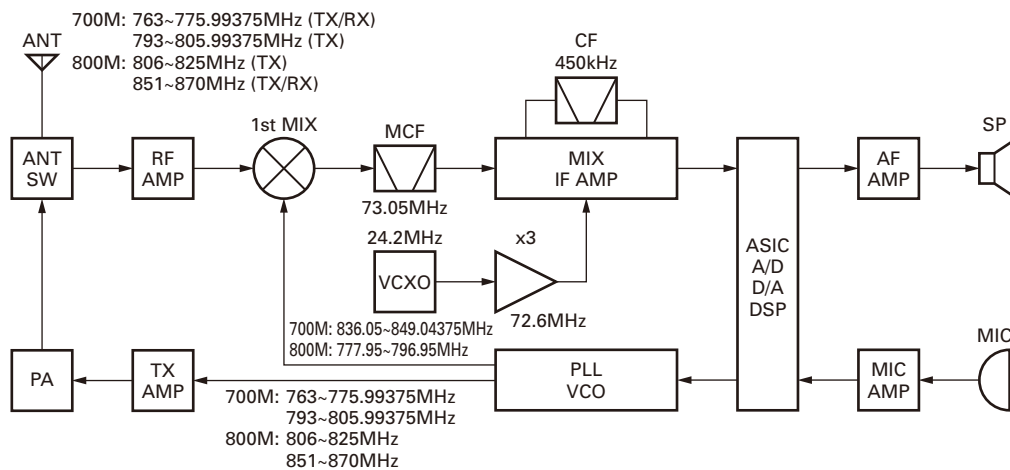


Fig. 1 Frequency configuration

### 3. Receiver System

#### 3-1. Front-end RF Amplifier

The receive signal from antenna SW (D212, D213) is amplified by a RF amplifier (700MHz band: Q213, 800MHz band: Q214) and passes through the band-pass filter (700MHz band: L200, L201, 800MHz band: L202, L203) to remove unwanted signal, and these are controlled with the RF filter switch (D214, D215). Then the signal is fed to the 1st mixer.

#### 3-2. 1st Mixer

The 1st mixer uses a silicon monolithic mixer (IC212). The 1st mixer mixes the signal with the 1st local oscillator frequency from the VCO, and converts it to the 1st IF (73.05MHz) (700M/Upper heterodyne, 800M/Lower heterodyne).

The signal then passes through monolithic crystal filter to remove unnecessary nearby frequency components. The signal from the MCF is used as the 1st IF signal.

The 1st IF section has two paths MCFs. Wide band is XF204 and Narrow band is XF202, and each band switched by D204, D205, D206, D207, D208, D209, D210 and D211.

#### 3-3. IF Amplifier

The 1st IF signal is amplified by the IF amplifier (Q205) and fed into the FM IC (IC209). The IF signal is then mixed with the 2nd local oscillator frequency of 72.6MHz to generate the 2nd IF of 450kHz. The 450kHz signal is then passed through a ceramic filter (CF202, CF204) and fed back into IC209 for additional amplification.

## CIRCUIT DESCRIPTION

### 3-4. Wide/Narrow/P25 Switching Circuit

Wide, Narrow, NPSPAC and P25 settings can be made for each channel by switching the ceramic filters CF201 and CF202 (Wide, NPSPAC), CF200 and CF204 (Narrow, P25), and there are controlled with the multiplexers (IC201, IC203, IC205, IC207).

When a  $\overline{WN2}$  Signal line is H, the 450kHz signal is passed through a ceramic filter (Wide: CF201 and CF202).

When a  $\overline{WN2}$  signal line is L, the 450kHz signal is passed through a ceramic filter (Narrow: CF200 and CF204).

After that, the signal is fed into ASIC (IC708) through ceramic filter (CF100). And then, the signal is demodulated in ASIC and the AF signal is dealing with DSP (IC701).

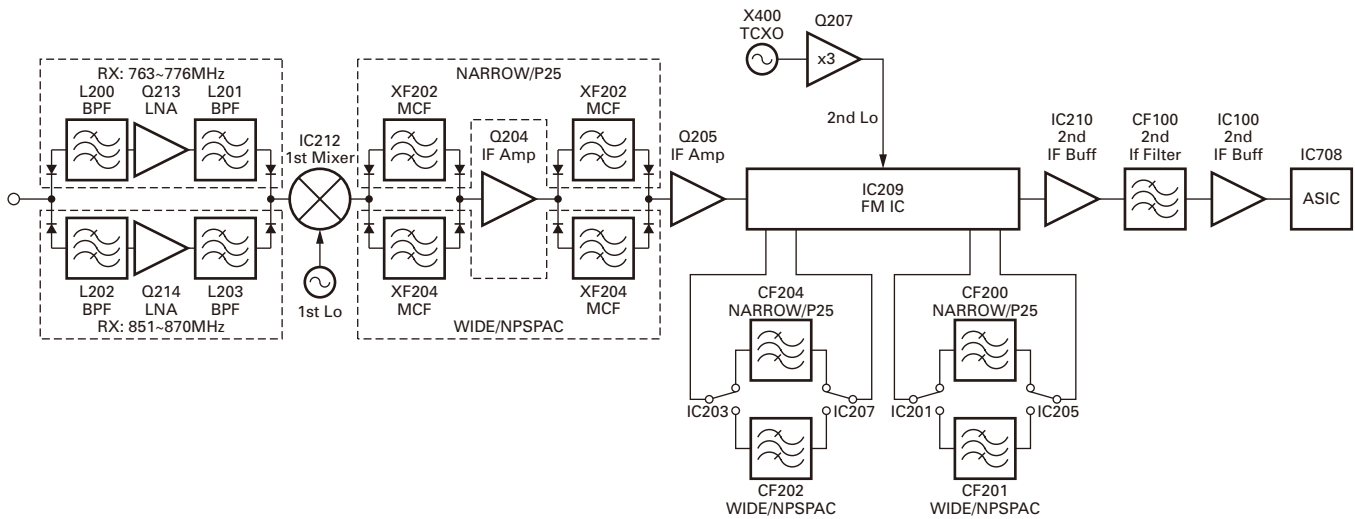


Fig. 2 RF and IF circuit

### 3-5. Audio Amplifier Circuit

Audio processing (high-pass filter, low-pass filter, deemphasized and so on) at FM mode and decoding at P25 mode are processed by DSP. Audio signal from IC708, IC701 goes through Low-pass filter (IC503). The signal then goes through mute switch (IC506), amplifier (IC510), and switch (IC515), and electronic volume control (IC517), and pre-amp (IC516), and audio mute switch (Q506), and audio route switch (IC518), and audio power amp (IC522).

(IC516), and audio mute switch (Q506), and audio route switch (IC518), and audio power amp (IC522).

While busy, /SPK\_MUTE becomes High, turn Mute switch (Q506) off, and signal is fed to AF Power Amp (IC522). While Non-busy, /SPK\_MUTE is become Low, turn Mute switch (Q506) on, then there is not AF output.

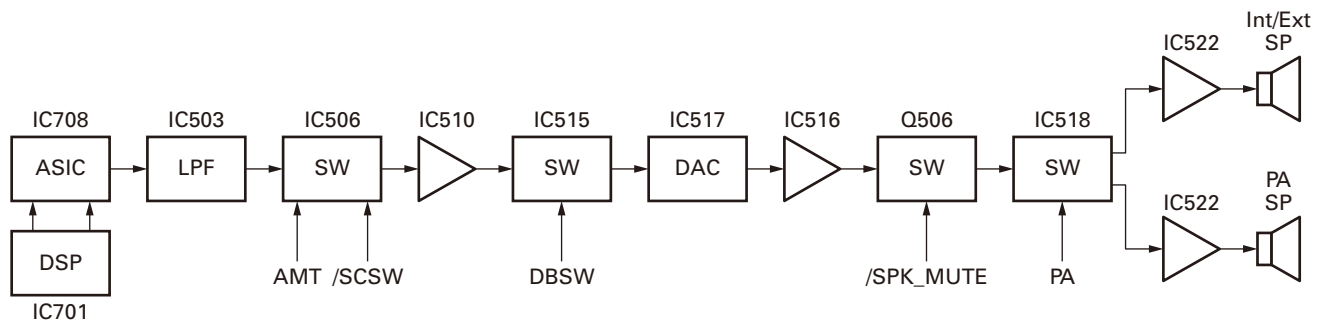


Fig. 3 Audio amplifier circuit

## CIRCUIT DESCRIPTION

### 3-6. Squelch Circuit

It amplifies the demodulated noise signal from FM IC (IC209) after filtering through BPF circuit. Then, the amplified signal is converted to DC signal by the detection circuit. The converted signal is fed to the ASIC (IC708).

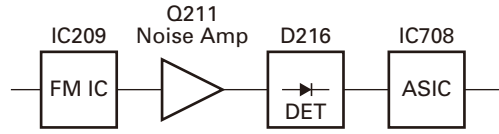


Fig. 4 Squelch circuit

## 4. Transmitter System

### 4-1. Audio Band Circuit

The signal from the microphone goes through the mute switch (Q503), the MIC-Mute signal (MM) becomes Low, and then mute switch (Q503) is turned off. The signal from microphone goes through summing-Amp (IC512) and MIC-AGC (IC512, Q501, Q502, D500, D501), and goes through audio route switch (IC509), and amplified by MIC-Amp IC505. LPF IC501 works as anti-aliasing filter.

### 4-2. Base Band Circuit

The audio signal output from the base band circuit is converted by ASIC (IC708) to digital data of a sampling

frequency of 48kHz. This digital data is sent to the DSP (IC701) and voice signals of 300Hz or lower and frequencies of 3kHz or higher are cut off and an audio range 300Hz to 3kHz is extracted. The audio signal is then pre-emphasized in FM mode and synthesized with the signals, such as QT and DQT, as required, and is then output from the ASIC (IC708). In P25 mode, the audio signal is converted to the C4FM base band signal and output from the ASIC (IC708). The DTMF base band signals are also generated by the DSP (IC701) and output by the ASIC (IC708).

LPF (IC514) works as smoothing filter. The DAC (IC517) assigns the base band signal to the VCO and VCXO (X400). At this time, the level output according to the transmit carrier is fine-adjusted according to each modulation method.

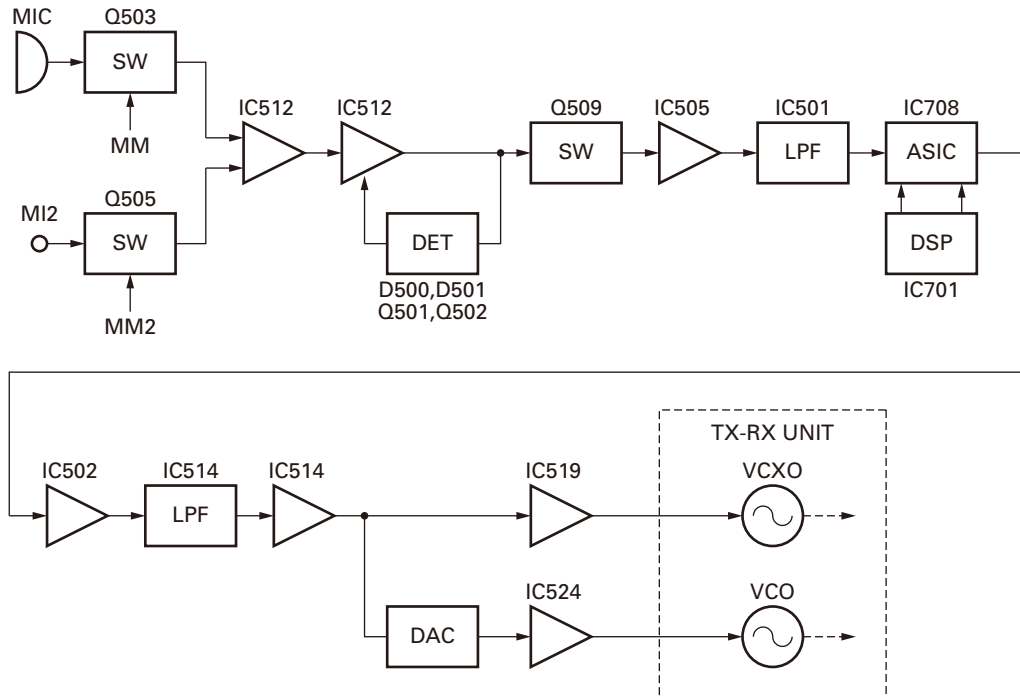


Fig. 5 Audio band and Base band circuit

## CIRCUIT DESCRIPTION

### 4-3. Drive Amplifier and Power module Circuits

The transmission signal is passed through the T/R switch (D420) and is amplified by the two drive amplifiers (Q150, Q151). This amplified signal is passed through the attenuator and is amplified by the power module (IC2).

The output of the power module (IC2) is passed through the CM coupler, ANT SW and LPF, and then it is fed to the antenna terminal (CN10).

### 4-4. Automatic Power Control Circuit

The automatic power control (APC) circuit stabilizes the transmission output power at a predetermined level, and consists of forward/reflected power detector circuits.

Forward RF power is detected by D5, and is converted into DC voltage. The converted DC voltage is fed to the APC comparator (IC1), and is compared with the PC voltage, then

is output from APC comparator (IC1) as an APC voltage. The APC voltage controls the gate voltage of the Pre Drive Amp (Q150), Drive Amp (Q151) and Power module (IC2), and keeps transmission output stable.

If an abnormal antenna load is connected, reflected RF power is detected by D6, and output voltage is fed to the APC comparator (IC1). The transmission output is reduced more as this DC voltage rises.

### 4-5. Temperature Protection Circuit

The temperature protection circuit reduces the APC voltage when the temperature of IC2 rises, to prevent thermal destruction of the final amplifier (IC2). The ASIC (IC708) detects the temperature with a thermistor (TH4, TH5) to control the reference voltage to the APC circuit.

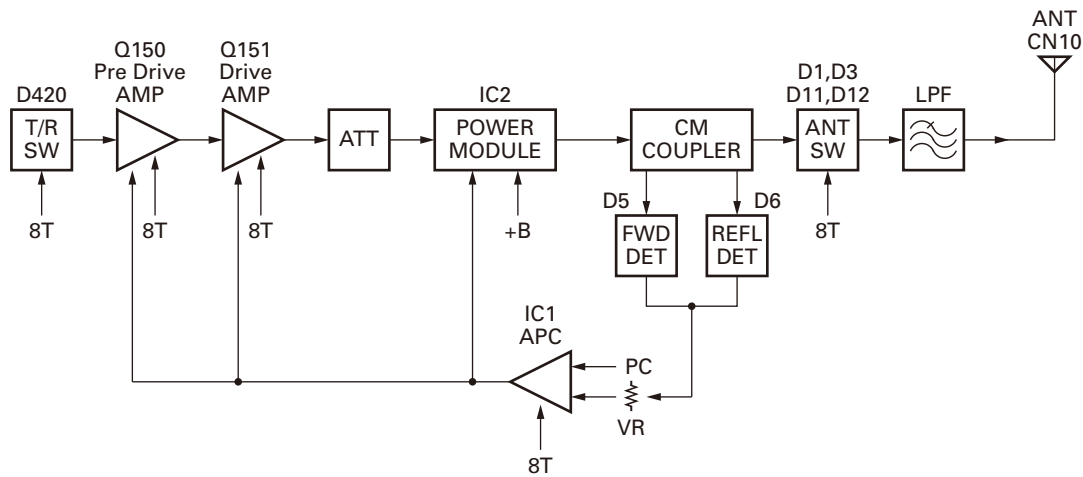


Fig. 6 Automatic power control circuit

## 5. PLL Frequency Synthesizer

The PLL Frequency Synthesizer consists of the following components:

- VCXO (X400)
- VCO (Q413, Q414, Q415)
- Potentiometer IC (IC401)
- PLL IC (IC400)
- Local Switch (D419, D420)

This PLL system is composed of a PLL-IC (IC400), a crystal oscillator (X400), VCO and a potentiometer (IC401).

VCO (Voltage Controlled Oscillator) is provided with 2 input terminals which are controlled by the potentiometer and by PLL.

The potentiometer brings the oscillation frequency of VCO close to the target frequency roughly, after that PLL locks it up.

The operation frequency of PLL is from 763 to 775.99375MHz, 793 to 805.99375MHz, 806 to 825MHz, 851 to 870MHz in TX mode and, from 777.95 to 796.95MHz, 836.05 to 849.04375MHz in RX mode.

The frequency step of PLL is 6.25kHz. The comparative frequency of PLL which is 100kHz is made by programmable reference divider in PLL-IC (IC400) from 24.2MHz reference signal of crystal oscillator (X400).

The VCO output signal is divided into comparative frequency by programmable N divider in PLL-IC (IC400) similarly, and is compared with the divided reference signal in a phase detector in it.

The output signal of the phase detector is put into one of the input terminals of VCO.

## CIRCUIT DESCRIPTION

### 5-1. VCXO (X400)

VCXO (X400) generates a reference frequency of 24.2MHz for the PLL frequency synthesizer.

This reference frequency is applied to pin 10 of the PLL IC (IC400).

The VCXO oscillation frequency is fine-adjusted by controlling the voltage applied to pin 1 of the VCCO with ASIC (IC708). It is also controlled with pin of 1 of the VCXO if the output from VCXO is modulated.

### 5-2. Voltage Controlled Oscillator (VCO)

There are three VCOs (VCO1, VCO2, VCO3).

The VCO1 (Q415) and VCO3 (Q413) generate 1st local receive signal or transmit carrier.

The VCO1 oscillation frequency is 381 to 399MHz and the VCO3 oscillation frequency is 418 to 435MHz.

The VCO2 (Q414) generate transmit carrier. The VCO2 oscillation frequency is 396 to 418MHz.

The VCO oscillation frequency is determined by two systems of operation switching terminals "STR" and "VCO1/2" and two systems of voltage control terminals "C/V" and "ASSIST".

The operation switching terminals, "STR" and "VCO1/2", are controlled by the control lines (STR, VCO1/2) output from the ASIC (IC708). When the STR logic is high and the VCO1/2 logic is high, the VCO 1 output a 1st local receive signal or transmit carrier. When the STR logic is high and the VCO1/2 logic is low, the VCO 2 output a transmit carrier. When the STR logic is low, the VCO3 output a 1st local receive signal or a transmit carrier.

The voltage control terminals, "CV" and "ASSIST", are controlled by the PLL IC (IC400) and potentiometer IC (IC401) and the output frequency changes continuously according to the applied voltage.

For the modulation input terminal, "MOD", the output frequency changes according to the applied voltage. The oscillation frequency is controlled by the voltage of the input terminals of the VCO, obtained from the potentiometer IC applying to varactor diodes (D416, D417, D421, D411, D412, D422, D405, D406, and D407), and from the phase detector applying to varactor diodes (D413, D414, D408, D409, D402, and D403).

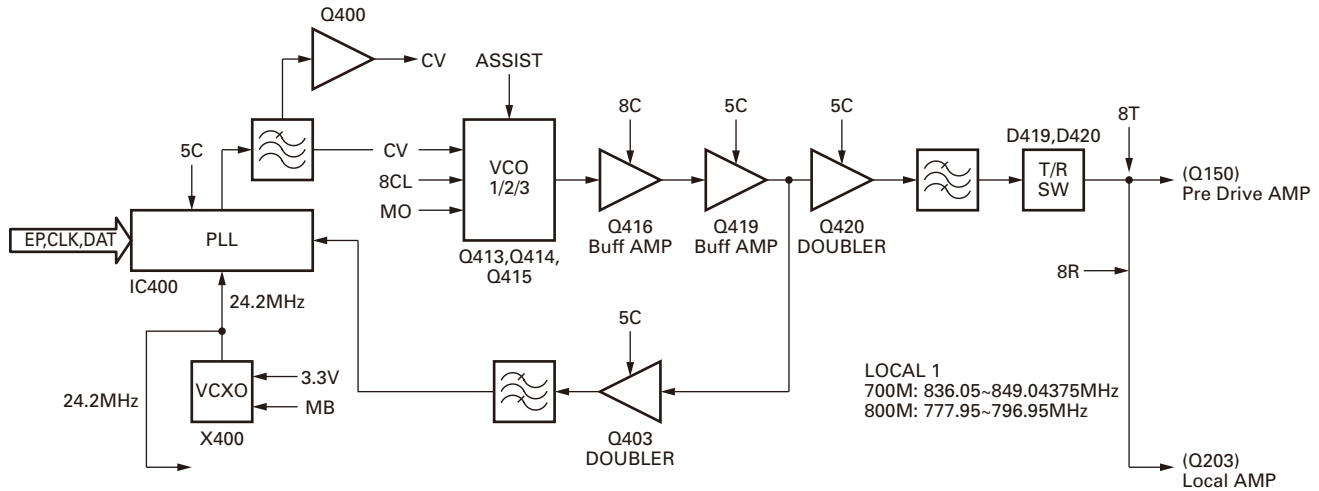
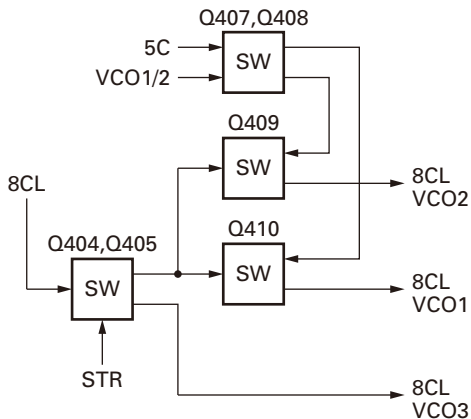


Fig. 7 System of PLL and VCO



## CIRCUIT DESCRIPTION



**Fig. 8 Operation of voltage control circuit for VCO**

### 5-3. Potentiometer IC (IC401)

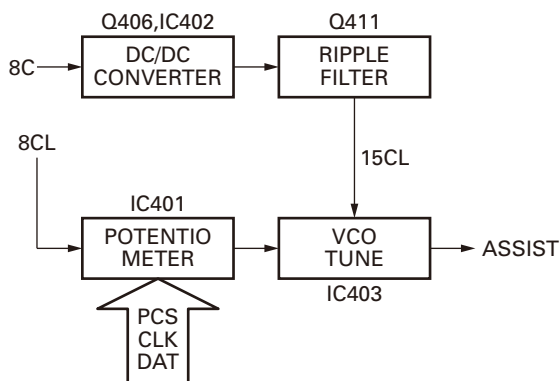
The potentiometer IC (IC401) is connected to the VCO voltage control terminal, "ASSIST", and quickly controls the VCO oscillation frequency. However, its accuracy is low and the VCO frequency cannot be matched accurately with the desired transmit carrier or the 1st local receive signal.

The potentiometer IC is controlled by the ASIC (IC708) through the 3-line "PCS", "DAT", "CLK" serial bus.

### 5-4. Lockup Accelerator

The lockup accelerator is a circuit composed of a potentiometer IC (IC401) and a DC amplifier (IC403) to compel the oscillation frequency of the VCO to be close to the target.

The potentiometer IC outputs the voltage which meets the target frequency, and the signal is connected to one of two input terminals of the VCO through the DC amplifier.



**Fig.9 Lockup accelerator**

### 5-5. PLL IC (IC400)

PLL IC compares the differences in phases of the VCO oscillation frequency and the VCXO 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 potentiometer IC is used before control by the PLL IC to bring the VCO oscillation frequency close to the desired frequency. As a result, the VCO CV voltage does not change and is always stable at approximately 2V.

The desired frequency is set for the PLL IC by the ASIC (IC708) through the 3-line "EP", "DAT", "CLK" serial bus.

Whether the PLL IC is locked or not is monitored by the ASIC through the "UL" signal line.

When the "UL" logic is low, the VCO is not the desired frequency (unlock),

### 5-6. Local Switch (D419, D420)

The connection destination of the signal output from the amplifier (Q420) is changed with the diode switch (D420) that is controlled by the transmission power supply, 8T, and the diode switch (D419) that is controlled by the receive power supply, 8R.

When the 8T logic is high, it is connected to a transmit-area pre-drive amplifier (Q150).

When the 8R logic is high, it passes through the local amplifier (Q203) and connected to a receive-area mixer (IC212).

## CIRCUIT DESCRIPTION

### 6. Control Circuit

The control circuit consists of the ASIC (IC708) and its peripheral circuits. IC708 performs the following;

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

#### 6-1. ASIC

The ASIC (IC708) is 32bit RISC processor, equipped with peripheral function and ADC/DAC.

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

#### 6-2. Memory Circuit

Memory circuit consists of the ASIC (IC708) and the SRAM (IC703), the flash memory (IC700). The flash memory has capacity of 64M-bit that contains the transceiver control program for the ASIC and stores the data. It also stores the data for transceiver channels and operating parameter that are written by the FPU. This program can be easily written from external devices. The SRAM has capacity of 2M-bit that contains work area and data area.

#### ■ Flash memory

The flash memory stores the data that is written by the FPU (KPG-95D), tuning data (Deviation, Squelch, etc.), and firmware program (User mode, Test mode, Tuning mode, etc.).

#### ■ SRAM (static memory)

The SRAM has temporary data area and work area.

When the power supply is off, it is backed up by an internal secondary lithium battery. Therefore, the save data does not break.

#### ■ Real-time clock

The clock function is based on real-time clock IC (IC704). When the power supply is off, it is backed up by an internal secondary lithium battery.

#### 6-3. Display Unit (KCH-14/15/16)

The display unit is composed of the CPU and the LCD & Key backlight etc.

#### 6-4. Temperature Detection Circuit

The temperature detection circuit detects the temperature using a temperature IC (IC702) and corrects the thermal characteristic change of the receiver and transmitter adjustments.

#### 6-5. DSP

The DSP circuit consists of a DSP (IC701) and processes the base band signal. The DSP operates on an external clock of 18.432MHz (the same as the IC708), the I/O section operates at 3.3V and the core section operates at 1.5V. The DSP carries out the following processes:

- C4FM processing
- Analog FM pre-emphasis/de-emphasis
- Vocoder processing between audio codec and modulation/demodulation
- CAI processing, such as error correction encoding
- QT/DQT encoding/decoding
- DTMF encoding
- Compressor/expander processing
- Transmit/receive audio filtering processing
- Microphone amplifier AGC processing
- Audio mute processing
- Modulation level processing

### 7. Power Supply Circuit

+B is connected to Final amplifier and DC/DC converter IC (IC4). IC4 regulates +B voltage to 5.0V (5M). 5M operates whenever +B is supplied. IC2 (33M), IC7 (33A) and IC8 (15M) are enabled while the 5M are operating. 33M, 33A and 15M provide the power to ASIC, DSP, and Flash memory. At this time ASIC starts working. Voltage detector IC (IC1) watches +B voltage. If +B voltage is higher than 8.6V, IC1 (/BINT) outputs High. If the /BINT signal is high, Q3 (SB SW) is turned on by SBC signal from ASIC. (High: SB=ON, Low: SB=OFF). When the SB is turned on, IC5 (8C), IC3 (5C), IC9 (33GPS) start working. Q5 and Q10 and Q11 are controlled by SBC signal. If the SBC signal becomes High, Q5 (33M2) operates and Q10 (33AC) operates and Q11 (5MC SW) are turned on. The ASIC controls 8TC to High during transmission to supply power (8T) for transmission circuit. The ASIC controls 8RC to High during reception to supply power (8R) for reception circuit. When the ASIC detects the PSW (Power switch) signal, IGN (Ignition sense) signal or /BINT signal, it controls the SBC signal to Low, and turns the transceiver power (SB) off. When D1 and Q1 detect over-voltage condition, they turns Q3 (SB SW) off. But the ASIC still works.

If +B is not provided to the transceiver, the power is provided to SRAM and RTC through the secondary battery connected with CN4.

## CIRCUIT DESCRIPTION

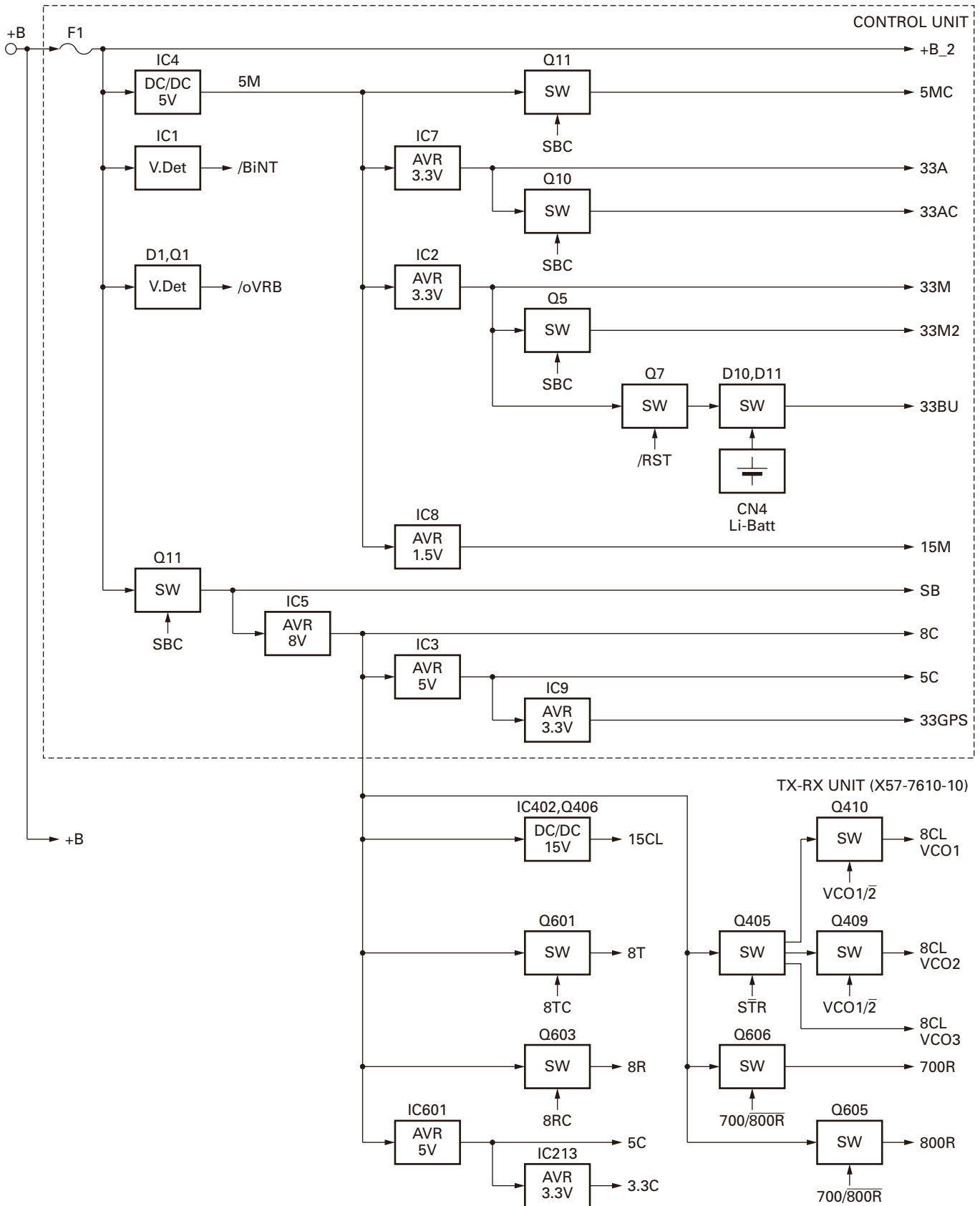


Fig. 10 Power supply circuit

## COMPONENTS DESCRIPTION

## Control unit (X53-4400-10)

Ref. No.	Part Name	Description
IC1	IC	Voltage detector (/BINT)
IC2	IC	Voltage regulator (33M)
IC3	IC	Voltage regulator (5C)
IC4	IC	DC/DC converter (5M)
IC5	IC	Voltage regulator (8C)
IC7	IC	Voltage regulator (33A)
IC8	IC	Voltage regulator (15M)
IC9	IC	Voltage regulator (33GPS)
IC100	IC	IF AMP (2nd IF)
IC101	IC	Buffer AMP (RSSI/ASQ)
IC102	IC	Buffer AMP (CV)
IC103	IC	Buffer AMP (FTEMP1/FTEMP2)
IC200	IC	Data multiplexer
IC201	IC	Data multiplexer
IC202~206	IC	3.3V to 5V level converter
IC207	IC	5V to 3.3V level converter
IC208	IC	3.3V-5V level shifter
IC400	IC	I/O expander
IC401	IC	RS-232C driver
IC501	IC	DC AMP (Reference voltage)/Audio AMP (MIC)
IC502	IC	Buffer AMP (Data input)/DC AMP (Modulation line)
IC503	IC	Low-pass filter (RX audio)/Buffer AMP (Scrambler RX audio)
IC505	IC	Audio AMP (Scrambler TX audio)/Summing AMP (TX audio)
IC506	IC	Audio switch (Scrambler RX audio)
IC507	IC	Audio AMP (Scrambler TX audio)/DC AMP (Reference voltage)
IC508	IC	Audio switch (Side tone/VGS audio)
IC509	IC	Audio switch (Scrambler TX audio)
IC510	IC	Summing AMP (RX audio)/Audio AMP (VGS recording audio)
IC511	IC	Audio switch (VGS recoding audio)
IC512	IC	Audio AMP (MIC AGC)/Summing AMP (MIC)
IC513	IC	Audio switch (TX audio monitor)
IC514	IC	Low-pass filter (Modulation signal)/Summing AMP (Data input)
IC515	IC	Audio switch (Optional audio line)
IC516	IC	Audio AMP (RX audio)
IC517	IC	8ch D/A converter
IC518	IC	Audio switch (Audio AMP output)
IC519	IC	DC AMP (Power control voltage)
IC520	IC	Audio AMP (Data output)/Audio AMP (AF output)
IC521	IC	DC AMP (RX front-end tuning voltage)

Ref. No.	Part Name	Description
IC522	IC	Audio power AMP
IC523	IC	DC AMP (2nd Lo TCXO tuning voltage)
IC524	IC	Audio AMP (Modulation for VCO)
IC525	IC	DC AMP (Reference voltage)
IC700	IC	Flash memory
IC701	IC	Digital signal processor
IC702	IC	Temperature sensor
IC703	IC	Static memory
IC704	IC	Real-time clock
IC705	IC	Voltage detector (System reset)
IC706	IC	Buffer AMP (Logic)
IC707	IC	Clock buffer AMP
IC708	IC	ASIC
Q1	Transistor	Over voltage control switch
Q2	Transistor	DC switch (SB)
Q3	FET	DC switch (SB)
Q4	FET	DC switch (33M2)
Q5	Transistor	DC switch (33M2)
Q6	FET	DC switch (33BU)
Q7	Transistor	DC switch (33BU)
Q8	FET	DC switch (33AC)
Q9	FET	DC switch (5MC)
Q10	Transistor	DC switch (33AC)
Q11	Transistor	DC switch (5MC)
Q12,13	Transistor	DC switch (PSC)
Q200,201	FET	DC switch (Power switch)
Q203,205	FET	DC switch (Panel reset)
Q204,206	Transistor	Data transmit (TRD)
Q400,401	Transistor	Data receive (GPS)
Q402,403	Transistor	DC switch (Aux output)
Q501	Transistor	AGC attenuator
Q502	Transistor	MIC AGC attenuator
Q503,505	FET	DC switch (MIC mute)
Q504	Transistor	DC switch (RX audio mute)
Q506	Transistor	Audio mute switch (RX audio)
Q507	Transistor	Mute switch (Audio power amp)
Q508	FET	DC switch (Audio power AMP mute)
Q509	Transistor	DC switch (Relay)
Q510	Transistor	DC switch (Ignition)
D1	Zener diode	Over voltage detection (+B)
D2	Diode	Capacitor discharge switch
D3	Diode	Over voltage protection switch
D4	Diode	Voltage protection (BLVL)
D5	Diode	Reverse current prevention (TAM1)
D6	Diode	DC/DC converter catch diode
D7	Diode	Logic control switch (SBC)

## COMPONENTS DESCRIPTION

Ref. No.	Part Name	Description
D8	Diode	DC/DC converter boost diode
D10,11	Diode	Reverse current prevention (33BU)
D400~405	Diode	Surge absorption (D-sub connector)
D406~409	Diode	Logic level converter (GPS data)
D410,429,430	Zener diode	Surge absorption (D-sub connector)
D411,412	Varistor	Surge absorption (D-sub connector)
D413~421	Diode	Surge absorption (D-sub connector)
D422,423	Varistor	Surge absorption (D-sub connector)
D424,425	Diode	Surge absorption (D-sub connector)
D426~428	Zener diode	Surge absorption (D-sub connector)
D500,501	Diode	AGC detection
D502	Zener diode	Surge absorption (D-sub connector)
D503	Diode	Surge absorption (D-sub connector)
D504,505	Varistor	Surge absorption (Display unit)
D506	Varistor	Over current protection (Display unit)
D507,508	Varistor	Surge absorption (Display unit)
D509	Diode	Discharge switch (ASQ)
D510	Varistor	Surge absorption (Display unit)
D512	Diode	Voltage protection (MB)

### TX-RX unit (X57-7610-10)

Ref. No.	Part Name	Description
IC1	IC	DC AMP and APC comparator
IC2	IC	Power module
IC201,203	IC	IF Filter switch
IC205,207	IC	IF Filter switch
IC209	IC	FM IC
IC210	IC	Buffer
IC211	IC	Multiplexer
IC212	IC	Mixer
IC213	IC	Voltage regulator (3.3V)
IC400	IC	PLL IC
IC401	IC	Potentiometer
IC402	IC	DC/DC
IC403	IC	VCO tune
IC404	IC	UL detection
IC600	IC	Shift register
IC601	IC	Voltage regulator (5V)
IC602,603	IC	Audio switch
Q150	FET	TX pre-drive AMP
Q151	FET	TX drive AMP
Q201,202	Transistor	DC switch
Q203	Transistor	RF AMP
Q204,205	Transistor	IF AMP
Q207	Transistor	Tripler AMP

Ref. No.	Part Name	Description
Q208	Transistor	DC switch
Q209	Transistor	DC switch
Q210	FET	DC switch
Q211	Transistor	Noise AMP
Q213,214	FET	RF AMP
Q400	FET	CV detection
Q403	Transistor	Doubler AMP
Q404	Transistor	DC switch
Q405	FET	DC switch
Q406	FET	DC/DC
Q407	Transistor	DC switch
Q408	FET	DC switch
Q409,410	Transistor	DC switch
Q411,412	Transistor	Ripple filter
Q413~415	FET	VCO oscillator
Q416,419	Transistor	Buffer AMP
Q420	Transistor	Doubler AMP
Q600~603	Transistor	DC switch
Q605~607	FET	DC switch
D1	Diode	ANT switch
D2	Zener diode	Protect of voltage
D3	Diode	ANT switch
D5	Diode	Forward wave rectification
D6	Diode	Reflected wave rectification
D10	Diode	Combiner
D11,12	Diode	ANT switch
D13	Surge absorber	Surge absorption
D14	Diode	Protect of reverse connection
D15,16	Diode	ANT switch
D17	Surge absorber	Surge absorption
D204~211	Diode	IF switch
D212~215	Diode	700/800M switch
D216,217	Diode	Noise detector
D400	Diode	Ripple filter
D401	Diode	Assist DC
D402,403	Variable capacitance diode	VCO control
D405~409	Variable capacitance diode	VCO control
D411~414	Variable capacitance diode	VCO control
D416~418	Variable capacitance diode	VCO control
D419,420	Diode	TX/RX switch
D421~424	Variable capacitance diode	VCO control

# TK-5910(B)

## PARTS LIST

\* New Parts. Δ indicates safety critical components.

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

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

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

L : Scandinavia

Y : PX (Far East, Hawaii)

C : China

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

### TK-5910(B)

#### CONTROL UNIT (X53-4400-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
<b>TK-5910(B)</b>					
1	3A	*	A01-2161-32	METALLIC CABINET (TOP)	
2	1B		A01-2162-32	METALLIC CABINET (BOTTOM)	
3	2B	*	A10-4126-01	CHASSIS	
5	1D	*	B62-1938-10	INSTRUCTION MANUAL	
7	2B		E04-0170-15	RF COAXIAL RECEPTACLE (N)	
8	1C		E37-0733-05	SHORT PLUG (SP) ACCESSORY	
9	2B	*	E37-0772-35	LEAD WIRE WITH CONNECTOR (D-SUB)	
10	2A,3A		E37-1147-15	FLAT CABLE (X53 CN501-X57 CN600)	
11	1B		E37-1149-25	LEAD WIRE WITH CONNECTOR (DC2P/ACC9P)	
13	1A	*	E37-1325-15	LEAD WIRE WITH CONNECTOR (FINAL-CONT)	
W700	3A	*	E37-1326-15	LEAD WIRE WITH CONNECTOR (CONT-PANEL)	
15	2B		F10-1479-03	SHIELDING PLATE (FINAL)	
16	1A		F10-2265-13	SHIELDING COVER (VCO,TX-RX)	
17	3B		F10-3012-04	SHIELDING PLATE (X53-440)	
18	1B	*	F10-3113-04	SHIELDING PLATE (LPF)	
19	1A	*	F10-3126-03	SHIELDING CASE (PM)	
21	3A		G02-0709-04	FLAT SPRING (AUDIO AMP)	
22	3A	*	G02-1844-04	FLAT SPRING (AVR)	
23	1B		G10-1327-04	FIBROUS SHEET	
24	2A,2B,1C		G11-4379-04	SHEET ACCESSORY	
25	1A		G13-2182-04	CUSHION (X57 SHIELDING PLATE)	
27	1B		G13-2195-14	CUSHION (CABINET)	
28	2B		G13-2196-04	CUSHION (FINAL SHIELDING PLATE)	
29	2B		G53-1626-03	PACKING (D-SUB CAP)	
30	2B		G53-1658-04	PACKING (DC/ACC)	
31	3A		G53-1665-12	PACKING (TOP)	
33	1B		G53-1666-12	PACKING (BOTTOM)	
34	2B		G53-1687-04	PACKING (D-SUB)	
35	2B		G53-1789-04	PACKING (ANT)	
37	1C		H02-0626-04	INNER CARTON CASE	
38	2C		H12-3176-02	PACKING FIXTURE (HEAD-SPACE)	
39	2C,3C	*	H12-4270-02	PACKING FIXTURE (TOP,BOTTOM)	
40	3D	*	H12-4288-03	PACKING FIXTURE (BACK-SPACE)	
41	2D	*	H21-0781-04	PROTECTION SHEET (RADIO)	
45	3C	*	H52-2274-02	ITEM CARTON CASE	
48	1B,3A,3B		J39-0651-15	SPACER (TOP,BOTTOM CABINET)	
A	2B		N09-2292-05	HEXAGON HEAD SCREW (D-SUB)	
B	1B,3A,3B		N32-3008-43	FLAT HEAD MACHINE SCREW (CABINET)	
C	1A		N35-3006-48	BINDING HEAD MACHINE SCREW (DC TERMINAL)	
D	1A		N67-3008-48	PAN HEAD SEMS SCREW (POWER MODULE)	
E	1A		N68-4006-48	PAN HEAD SEMS SCREW (DC TERMINAL)	
F	1A,2A 2B,3B		N87-2606-48	BRAZIER HEAD TAPTITE SCREW (PCB)	
G	1A		N87-2612-48	BRAZIER HEAD TAPTITE SCREW (SHIELD)	
H	1B,2B		N87-3008-48	BRAZIER HEAD TAPTITE SCREW (DC/ACC,ANT)	
50	1C		N99-2051-05	SCREW SET ACCESSORY	
52	3B		W09-0971-05	LITHIUM CELL (X53)	
-		*	X53-4400-11	SERVICE CONTROL UNIT	

Ref. No.	Address	New parts	Parts No.	Description	Destination
<b>CONTROL UNIT (X53-4400-10)</b>					
C1			CK73GB1H473K	CHIP C 0.047UF	K
C2			CK73HB1H102K	CHIP C 1000PF	K
C3			CK73HB1H471K	CHIP C 470PF	K
C4			CC73HCH1H101J	CHIP C 100PF	J
C5			CC73HCH1H470J	CHIP C 47PF	J
C6			C92-0891-05	ELECTRO 330U 25WV	
C7			CK73HB1H471K	CHIP C 470PF	K
C8			CK73HB1E103K	CHIP C 0.010UF	K
C9			CK73GB1E105K	CHIP C 1.0UF	K
C10			CK73HB1E103K	CHIP C 0.010UF	K
C11			CK73HB1A104K	CHIP C 0.10UF	K
C12			CK73HB1H471K	CHIP C 470PF	K
C13			CK73GB1H104K	CHIP C 0.10UF	K
C14			CK73HB1E103K	CHIP C 0.010UF	K
C16			CK73HB1H471K	CHIP C 470PF	K
C17			CK73FB1E475K	CHIP C 4.7UF	K
C19			CK73FB1E475K	CHIP C 4.7UF	K
C20			CK73HB1A104K	CHIP C 0.10UF	K
C21			CK73HB1E103K	CHIP C 0.010UF	K
C22			CK73GB1E105K	CHIP C 1.0UF	K
C25			CK73GB1H104K	CHIP C 0.10UF	K
C26			CK73HB1E103K	CHIP C 0.010UF	K
C27			CS77BA1A100M	CHIP TNTL 10UF 10WV	
C29			CK73GB1E105K	CHIP C 1.0UF	K
C32			CK73FB1A106K	CHIP C 10UF	K
C33,34			CK73HB1E103K	CHIP C 0.010UF	K
C35			CK73GB1E105K	CHIP C 1.0UF	K
C37			CK73FB1A106K	CHIP C 10UF	K
C38			CK73HB1E103K	CHIP C 0.010UF	K
C39			CK73FB1A106K	CHIP C 10UF	K
C40			CK73GB1E105K	CHIP C 1.0UF	K
C41		*	CS77BC1C330M	CHIP TNTL 33UF 16WV	
C42			CK73FB1A106K	CHIP C 10UF	K
C43			C92-0765-05	CHIP TNTL 4.7UF 16WV	
C45			CK73GB1E105K	CHIP C 1.0UF	K
C47			CK73HB1E103K	CHIP C 0.010UF	K
C48			CK73GB1C225K	CHIP C 2.2UF	K
C50			CK73HB1H471K	CHIP C 470PF	K
C51			CK73HB1E103K	CHIP C 0.010UF	K
C53			CK73HB1E103K	CHIP C 0.010UF	K
C55			CK73GB1C225K	CHIP C 2.2UF	K
C59,60			CK73FB1E475K	CHIP C 4.7UF	K
C100,101			CK73HB1A104K	CHIP C 0.10UF	K
C103,106			CK73HB1E103K	CHIP C 0.010UF	K
C108,109			CK73HB1E103K	CHIP C 0.010UF	K
C110-113			CK73HB1A104K	CHIP C 0.10UF	K
C122,123			CK73HB1A104K	CHIP C 0.10UF	K
C124,125			CK73HB1H102K	CHIP C 1000PF	K
C126			CK73HB1A104K	CHIP C 0.10UF	K
C200			CK73HB1A104K	CHIP C 0.10UF	K
C201			CK73HB1H102K	CHIP C 1000PF	K
C202-209			CK73HB1A104K	CHIP C 0.10UF	K
C210-216			CK73HB1H102K	CHIP C 1000PF	K
C400,401			CK73HB1A104K	CHIP C 0.10UF	K

## PARTS LIST

## CONTROL UNIT (X53-4400-10)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C402			CC73HCH1H101J	CHIP C 100PF J		C566			CC73HCH1H220J	CHIP C 22PF J	
C403			CK73GB1A104K	CHIP C 0.10UF K		C567,568			CK73HB1A104K	CHIP C 0.10UF K	
C404			CC73HCH1H101J	CHIP C 100PF J		C570			CC73HCH1H220J	CHIP C 22PF J	
C405			CK73HB1A104K	CHIP C 0.10UF K		C571,572			CK73HB1A104K	CHIP C 0.10UF K	
C406			CC73HCH1H101J	CHIP C 100PF J		C574			CC73HCH1H470J	CHIP C 47PF J	
C407			CK73GB1H104K	CHIP C 0.10UF K		C575-577			CK73FB1A106K	CHIP C 10UF K	
C408			CC73HCH1H101J	CHIP C 100PF J		C578-580			CK73HB1A104K	CHIP C 0.10UF K	
C409			CK73FB1A225K	CHIP C 2.2UF K		C581,582			CK73HB1H102K	CHIP C 1000PF K	
C410			CK73HB1E103K	CHIP C 0.010UF K		C583			CK73FB1A106K	CHIP C 10UF K	
C411			CK73HB1H102K	CHIP C 1000PF K		C585			CK73HB1A104K	CHIP C 0.10UF K	
C412,413			CK73GB1E105K	CHIP C 1.0UF K		C586			CK73FB1A106K	CHIP C 10UF K	
C414			CK73HB1A104K	CHIP C 0.10UF K		C587			CK73HB1A104K	CHIP C 0.10UF K	
C415			CK73GB1E105K	CHIP C 1.0UF K		C589			CK73HB1A104K	CHIP C 0.10UF K	
C416			CC73HCH1H101J	CHIP C 100PF J		C590			CK73HB0J105K	CHIP C 1.0UF K	
C417			CK73GB1E105K	CHIP C 1.0UF K		C591			CC73HCH1H101J	CHIP C 100PF J	
C418			CK73GB1H104K	CHIP C 0.10UF K		C593			CC73HCH1H390J	CHIP C 39PF J	
C419			CC73HCH1H101J	CHIP C 100PF J		C594			CK73HB1A104K	CHIP C 0.10UF K	
C422			CK73FB1A106K	CHIP C 10UF K		C596			CK73HB1H102K	CHIP C 1000PF K	
C423			CK73HB1A104K	CHIP C 0.10UF K		C597			CK73HB1H471K	CHIP C 470PF K	
C424			CC73HCH1H101J	CHIP C 100PF J		C598			CC73HCH1H101J	CHIP C 100PF J	
C425			CK73HB1H102K	CHIP C 1000PF K		C599			CK73HB1A104K	CHIP C 0.10UF K	
C427,428			CK73FB1A106K	CHIP C 10UF K		C600			CE32BD1E470M	ELECTRO 47UF 25WV	
C451-472			CC73HCH1H101J	CHIP C 100PF J		C601			CC73HCH1H470J	CHIP C 47PF J	
C500			CK73HB0J105K	CHIP C 1.0UF K		C602	*		CE32BD1E101M	ELECTRO 100UF 25WV	
C503-505			CK73HB1A104K	CHIP C 0.10UF K		C603			CK73HB1A104K	CHIP C 0.10UF K	
C506			CK73HB1H122K	CHIP C 1200PF K		C605			CK73HB1A104K	CHIP C 0.10UF K	
C507-510			CK73HB1E103K	CHIP C 0.010UF K		C608			CK73GB1H103K	CHIP C 0.010UF K	
C512			CC73HCH1H151J	CHIP C 150PF J		C609-616			CC73HCH1H470J	CHIP C 47PF J	
C513			CC73HCH1H221J	CHIP C 220PF J		C617			CK73HB1E103K	CHIP C 0.010UF K	
C516			CC73HCH1H220J	CHIP C 22PF J		C618-625			CK73HB1H471K	CHIP C 470PF K	
C517,518			CK73HB1A104K	CHIP C 0.10UF K		C626-628			CC73HCH1H470J	CHIP C 47PF J	
C520			CS77BA1A100M	CHIP TNL 10UF 10WV		C629			CK73GB1H103K	CHIP C 0.010UF K	
C521			CK73HB1H122K	CHIP C 1200PF K		C630-637			CK73HB1H102K	CHIP C 1000PF K	
C522			CK73HB1A104K	CHIP C 0.10UF K		C638-640			CK73HB1H471K	CHIP C 470PF K	
C524-527			CK73HB1A104K	CHIP C 0.10UF K		C641-644			CK73HB1H102K	CHIP C 1000PF K	
C528			CC73HCH1H101J	CHIP C 100PF J		C645			CK73HB1A104K	CHIP C 0.10UF K	
C529-531			CK73HB1A104K	CHIP C 0.10UF K		C647,648			CK73HB1A104K	CHIP C 0.10UF K	
C533,534			CK73HB1A104K	CHIP C 0.10UF K		C650			CK73HB1A104K	CHIP C 0.10UF K	
C535			CC73HCH1H220J	CHIP C 22PF J		C653			CK73HB1H681K	CHIP C 680PF K	
C536			CK73HB1A104K	CHIP C 0.10UF K		C700,701			CK73HB0J105K	CHIP C 1.0UF K	
C537			CC73HCH1H220J	CHIP C 22PF J		C702-704			CK73HB1H102K	CHIP C 1000PF K	
C539			CC73HCH1H220J	CHIP C 22PF J		C705-708			CK73HB1A104K	CHIP C 0.10UF K	
C540,541			CK73HB1A104K	CHIP C 0.10UF K		C709,710			CS77CP0J100M	CHIP TNL 10UF 6.3WV	
C542			CC73HCH1H220J	CHIP C 22PF J		C711			CK73HB1A104K	CHIP C 0.10UF K	
C543-545			CK73HB1A104K	CHIP C 0.10UF K		C712,713			CK73HB1H102K	CHIP C 1000PF K	
C546			CC73HCH1H220J	CHIP C 22PF J		C714			CK73HB1A104K	CHIP C 0.10UF K	
C548			CC73HCH1H220J	CHIP C 22PF J		C716			CK73HB1A104K	CHIP C 0.10UF K	
C549-551			CK73HB1A104K	CHIP C 0.10UF K		C717			CK73HB1H102K	CHIP C 1000PF K	
C552			CK73HB1H681K	CHIP C 680PF K		C718			CK73HB1A104K	CHIP C 0.10UF K	
C553			CK73FB1A106K	CHIP C 10UF K		C719			CK73HB1E103K	CHIP C 0.010UF K	
C554			CC73HCH1H390J	CHIP C 39PF J		C720			CK73HB1H102K	CHIP C 1000PF K	
C555,556			CK73GB1C225K	CHIP C 2.2UF K		C722,723			CK73HB1A104K	CHIP C 0.10UF K	
C557			CK73HB1A104K	CHIP C 0.10UF K		C724			CK73HB0J105K	CHIP C 1.0UF K	
C558,559			CK73HB1H102K	CHIP C 1000PF K		C725-727			CK73HB1H102K	CHIP C 1000PF K	
C560			CC73HCH1H220J	CHIP C 22PF J		C728,729			CK73HB1A104K	CHIP C 0.10UF K	
C561			CK73FB1A106K	CHIP C 10UF K		C731			CK73GB1E105K	CHIP C 1.0UF K	
C562			CK73HB1A104K	CHIP C 0.10UF K		C732			CK73HB1E103K	CHIP C 0.010UF K	
C563			CK73FB1A106K	CHIP C 10UF K		C733			CK73HB1H102K	CHIP C 1000PF K	
C564			CK73HB1H102K	CHIP C 1000PF K		C734			CK73HB1E103K	CHIP C 0.010UF K	
C565			CK73HB1A104K	CHIP C 0.10UF K		C736,737			CK73HB1H102K	CHIP C 1000PF K	

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## PARTS LIST

### CONTROL UNIT (X53-4400-10)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C738,739			CK73HB1E103K	CHIP C 0.010UF K		R11			RK73HH1J104D	CHIP R 100K D 1/16W	
C743			CK73HB1A104K	CHIP C 0.10UF K		R13			RK73HB1J103J	CHIP R 10K J 1/16W	
C744			CK73HB1H102K	CHIP C 1000PF K		R14			RK73HB1J392J	CHIP R 3.9K J 1/16W	
C745			CK73HB1E103K	CHIP C 0.010UF K		R15			RK73HB1J103J	CHIP R 10K J 1/16W	
C746			CK73HB1H102K	CHIP C 1000PF K		R17			RK73GB2A220J	CHIP R 22 J 1/10W	
C747,748			CK73HB1A104K	CHIP C 0.10UF K		R20			RK73HB1J103J	CHIP R 10K J 1/16W	
C749			CS77CP0J100M	CHIP TNTL 10UF 6.3VWV		R23			RK73HB1J332J	CHIP R 3.3K J 1/16W	
C750			CK73HB1E103K	CHIP C 0.010UF K		R27			RK73HB1J474J	CHIP R 470K J 1/16W	
C753,754			CK73HB1A104K	CHIP C 0.10UF K		R28			RK73HB1J103J	CHIP R 10K J 1/16W	
C756			CK73HB1E103K	CHIP C 0.010UF K		R29			RK73HH1J124D	CHIP R 120K D 1/16W	
C757			CK73HB0J105K	CHIP C 1.0UF K		R30			RK73HH1J183D	CHIP R 18K D 1/16W	
C758			CK73HB1H102K	CHIP C 1000PF K		R31			RK73HH1J223D	CHIP R 22K D 1/16W	
C759			CK73HB1A104K	CHIP C 0.10UF K		R32			RK73HB1J103J	CHIP R 10K J 1/16W	
C760			CS77CP0J100M	CHIP TNTL 10UF 6.3VWV		R33			RK73HB1J272J	CHIP R 2.7K J 1/16W	
C762			CC73HCH1H101J	CHIP C 100PF J		R34			RK73HB1J473J	CHIP R 47K J 1/16W	
C763			CK73HB1H102K	CHIP C 1000PF K		R37,38			RK73HB1J103J	CHIP R 10K J 1/16W	
C764-767			CK73HB1A104K	CHIP C 0.10UF K		R40			RK73HB1J103J	CHIP R 10K J 1/16W	
C768			CK73HB1E103K	CHIP C 0.010UF K		R41			RK73HB1J102J	CHIP R 1.0K J 1/16W	
C769			CK73HB0J105K	CHIP C 1.0UF K		R46			RK73HB1J101J	CHIP R 100 J 1/16W	
C770			CK73HB1H102K	CHIP C 1000PF K		R49			RK73FB2B000J	CHIP R 0.0 J 1/8W	
C771-775			CK73HB1A104K	CHIP C 0.10UF K		R50			RK73HB1J103J	CHIP R 10K J 1/16W	
C776			CK73HB1E103K	CHIP C 0.010UF K		R51			RK73HB1J473J	CHIP R 47K J 1/16W	
C777			CK73HB0J105K	CHIP C 1.0UF K		R103			RK73HB1J102J	CHIP R 1.0K J 1/16W	
C779			CK73HB1E103K	CHIP C 0.010UF K		R104			RK73HB1J100J	CHIP R 10 J 1/16W	
C780,781			CK73FB1A106K	CHIP C 10UF K		R105			RK73HH1J274D	CHIP R 270K D 1/16W	
CN1			E41-2672-05	PIN ASSY		R106			RK73HH1J473D	CHIP R 47K D 1/16W	
CN411			E40-6357-05	PIN ASSY		R107			RK73HH1J274D	CHIP R 270K D 1/16W	
CN424			E40-6357-05	PIN ASSY		R108			RK73HH1J473D	CHIP R 47K D 1/16W	
CN444			E40-6357-05	PIN ASSY		R109			RK73HH1J274D	CHIP R 270K D 1/16W	
CN457			E40-6720-05	SOCKET FOR PIN ASSY		R110			RK73HH1J473D	CHIP R 47K D 1/16W	
CN459			E40-5960-05	PIN ASSY		R111			RK73HH1J274D	CHIP R 270K D 1/16W	
CN501			E40-6438-05	FLAT CABLE CONNECTOR		R112			RK73HH1J473D	CHIP R 47K D 1/16W	
<b>CN502</b>	2A		E40-6532-05	PIN ASSY		R114			RK73HB1J103J	CHIP R 10K J 1/16W	
CN503			E40-6472-05	PIN ASSY		R115			RK73HH1J274D	CHIP R 270K D 1/16W	
CN504			E41-2730-05	PIN ASSY		R116			RK73HH1J473D	CHIP R 47K D 1/16W	
F1			F53-0328-15	FUSE (5.0A)		R117			RK73HB1J103J	CHIP R 10K J 1/16W	
F400			F53-0371-05	FUSE (2.5A)		R118-122			RK73HH1J333D	CHIP R 33K D 1/16W	
CN4			J19-5386-05	HOLDER		R124,125			RK73HB1J333J	CHIP R 33K J 1/16W	
CF100			L72-1040-05	CERAMIC FILTER		R127			RK73HB1J470J	CHIP R 47 J 1/16W	
L2			L92-0639-05	CHIP FERRITE		R129,130			RK73HB1J470J	CHIP R 47 J 1/16W	
L4			L33-1496-05	SMALL FIXED INDUCTOR (22UH)		R131			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L500-502			L92-0140-05	CHIP FERRITE		R136			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L503-511			L92-0179-05	CHIP FERRITE		R138,139			RN73HH1J102D	CHIP R 1.0K D 1/16W	
L700-702			L92-0138-05	CHIP FERRITE		R140			RK73HB1J103J	CHIP R 10K J 1/16W	
L703-707			L92-0162-05	BEADS CORE		R200			RK73HB1J101J	CHIP R 100 J 1/16W	
L708,709			L92-0138-05	CHIP FERRITE		R201			RK73HB1J103J	CHIP R 10K J 1/16W	
X700			L77-1802-05	CRYSTAL RESONATOR (32.768KHZ)		R202			RK73HB1J470J	CHIP R 47 J 1/16W	
X701			L77-3015-05	TCXO (18.432MZ)		R203-207			RK73HB1J101J	CHIP R 100 J 1/16W	
R1			RK73HB1J471J	CHIP R 470 J 1/16W		R208			RK73HB1J104J	CHIP R 100K J 1/16W	
R2			RK73HB1J473J	CHIP R 47K J 1/16W		R209			RK73HB1J101J	CHIP R 100 J 1/16W	
R3			RK73HH1J274D	CHIP R 270K D 1/16W		R210			RK73HB1J103J	CHIP R 10K J 1/16W	
R4			RK73HH1J104D	CHIP R 100K D 1/16W		R211-225			RK73HB1J101J	CHIP R 100 J 1/16W	
R5			RK73HB1J103J	CHIP R 10K J 1/16W		R226			RK73HB1J104J	CHIP R 100K J 1/16W	
R6			RK73GB2A100J	CHIP R 10 J 1/10W		R227			RK73HB1J101J	CHIP R 100 J 1/16W	
R7			RK73HB1J103J	CHIP R 10K J 1/16W		R230			RK73HB1J103J	CHIP R 10K J 1/16W	
R8			RK73HB1J473J	CHIP R 47K J 1/16W		R231			RK73HB1J104J	CHIP R 100K J 1/16W	
R9			RK73HB1J683J	CHIP R 68K J 1/16W		R233-238			RK73HB1J104J	CHIP R 100K J 1/16W	
R10			RK73HH1J684D	CHIP R 680K D 1/16W		R239			RK73HB1J103J	CHIP R 10K J 1/16W	
						R240-266			RK73HB1J104J	CHIP R 100K J 1/16W	
						R268-271			RK73HB1J104J	CHIP R 100K J 1/16W	



## PARTS LIST

CONTROL UNIT (X53-4400-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R274			RK73HB1J103J	CHIP R 10K J 1/16W		R525			RK73HB1J683J	CHIP R 68K J 1/16W	
R275			RK73HB1J472J	CHIP R 4.7K J 1/16W		R527			RK73HB1J470J	CHIP R 47 J 1/16W	
R276-280			RK73HB1J104J	CHIP R 100K J 1/16W		R528			RK73HB1J683J	CHIP R 68K J 1/16W	
R281			RK73HB1J470J	CHIP R 47 J 1/16W		R531			RK73HB1J103J	CHIP R 10K J 1/16W	
R282			RK73HB1J472J	CHIP R 4.7K J 1/16W		R532			RK73HB1J473J	CHIP R 47K J 1/16W	
R283			RK73HB1J103J	CHIP R 10K J 1/16W		R535			RK73HB1J104J	CHIP R 100K J 1/16W	
R285-288			RK73HB1J104J	CHIP R 100K J 1/16W		R536			RK73HB1J470J	CHIP R 47 J 1/16W	
R289,290			RK73HB1J103J	CHIP R 10K J 1/16W		R537			RK73HB1J473J	CHIP R 47K J 1/16W	
R291			RK73HB1J104J	CHIP R 100K J 1/16W		R538			RK73HB1J393J	CHIP R 39K J 1/16W	
R292-296			RK73HB1J103J	CHIP R 10K J 1/16W		R540			RK73HB1J823J	CHIP R 82K J 1/16W	
R301			RK73HB1J104J	CHIP R 100K J 1/16W		R541,542			RK73HB1J470J	CHIP R 47 J 1/16W	
R303			RK73HB1J104J	CHIP R 100K J 1/16W		R543			RK73HB1J334J	CHIP R 330K J 1/16W	
R305-310			RK73HB1J470J	CHIP R 47 J 1/16W		R545			RK73HB1J124J	CHIP R 120K J 1/16W	
R311			RK73HB1J104J	CHIP R 100K J 1/16W		R546			RK73HB1J563J	CHIP R 56K J 1/16W	
R312-325			RK73HB1J101J	CHIP R 100 J 1/16W		R547			RK73HB1J184J	CHIP R 180K J 1/16W	
R328,329			RK73HB1J101J	CHIP R 100 J 1/16W		R548			RN73HH1J103D	CHIP R 10K D 1/16W	
R331-343			RK73HB1J101J	CHIP R 100 J 1/16W		R549			RK73HB1J470J	CHIP R 47 J 1/16W	
R344,345			RK73HB1J103J	CHIP R 10K J 1/16W		R550			RN73HH1J473D	CHIP R 47K D 1/16W	
R346			RK73GB2A332J	CHIP R 3.3K J 1/10W		R551			RK73HB1J470J	CHIP R 47 J 1/16W	
R347			RK73HB1J101J	CHIP R 100 J 1/16W		R552			RK73HB1J103J	CHIP R 10K J 1/16W	
R348			RK73HB1J000J	CHIP R 0.0 J 1/16W		R553			RK73HB1J563J	CHIP R 56K J 1/16W	
R349			RK73HB1J474J	CHIP R 470K J 1/16W		R554			RK73HB1J683J	CHIP R 68K J 1/16W	
R403			RK73FB2B000J	CHIP R 0.0 J 1/8W		R555			RK73HB1J470J	CHIP R 47 J 1/16W	
R405,406			RK73HB1J104J	CHIP R 100K J 1/16W		R556			RK73HB1J473J	CHIP R 47K J 1/16W	
R409,410			RK73HB1J104J	CHIP R 100K J 1/16W		R557			RK73HB1J394J	CHIP R 390K J 1/16W	
R412-418			RK73HB1J104J	CHIP R 100K J 1/16W		R558			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R420-423			RK73HB1J104J	CHIP R 100K J 1/16W		R559			RK73HB1J563J	CHIP R 56K J 1/16W	
R424,425			RK73HB1J473J	CHIP R 47K J 1/16W		R561			RK73HB1J123J	CHIP R 12K J 1/16W	
R427			RK73GB2A100J	CHIP R 10 J 1/10W		R562			RK73HB1J154J	CHIP R 150K J 1/16W	
R429			RK73FB2B000J	CHIP R 0.0 J 1/8W		R563			RK73HB1J470J	CHIP R 47 J 1/16W	
R431,432			RK73FB2B000J	CHIP R 0.0 J 1/8W		R564			RK73HB1J333J	CHIP R 33K J 1/16W	
R434			RK73FB2B000J	CHIP R 0.0 J 1/8W		R565			RK73HB1J104J	CHIP R 100K J 1/16W	
R437			RK73HB1J471J	CHIP R 470 J 1/16W		R566			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R438-440			RK73FB2B000J	CHIP R 0.0 J 1/8W		R567			RK73HB1J563J	CHIP R 56K J 1/16W	
R441			RK73HB1J471J	CHIP R 470 J 1/16W		R568			RK73HB1J224J	CHIP R 220K J 1/16W	
R444,445			RK73HB1J102J	CHIP R 1.0K J 1/16W		R569,570			RK73HB1J103J	CHIP R 10K J 1/16W	
R461-469			RK73HB1J102J	CHIP R 1.0K J 1/16W		R571			RK73HB1J392J	CHIP R 3.9K J 1/16W	
R471,472			RK73HB1J471J	CHIP R 470 J 1/16W		R572			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R473			RK73FB2B000J	CHIP R 0.0 J 1/8W		R573			RK73HB1J470J	CHIP R 47 J 1/16W	
R474			RK73HB1J471J	CHIP R 470 J 1/16W		R574			RK73HB1J103J	CHIP R 10K J 1/16W	
R475			RK73FB2B000J	CHIP R 0.0 J 1/8W		R576			RK73HB1J223J	CHIP R 22K J 1/16W	
R476			RK73HB1J471J	CHIP R 470 J 1/16W		R577,578			RK73HB1J470J	CHIP R 47 J 1/16W	
R477,478			RK73FB2B000J	CHIP R 0.0 J 1/8W		R579			RK73HB1J123J	CHIP R 12K J 1/16W	
R486,487			RK73HB1J101J	CHIP R 100 J 1/16W		R580			RK73HB1J470J	CHIP R 47 J 1/16W	
R500			RK73HB1J393J	CHIP R 39K J 1/16W		R581			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R501			RK73HB1J153J	CHIP R 15K J 1/16W		R583			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R502,503			RK73HB1J103J	CHIP R 10K J 1/16W		R585			RK73HB1J563J	CHIP R 56K J 1/16W	
R504			RK73HB1J683J	CHIP R 68K J 1/16W		R586			RK73HB1J223J	CHIP R 22K J 1/16W	
R505			RK73HB1J103J	CHIP R 10K J 1/16W		R587			RK73HB1J334J	CHIP R 330K J 1/16W	
R507			RK73HB1J103J	CHIP R 10K J 1/16W		R589			RK73HB1J470J	CHIP R 47 J 1/16W	
R508			RK73HB1J563J	CHIP R 56K J 1/16W		R590			RK73HB1J104J	CHIP R 100K J 1/16W	
R509,510			RK73HB1J104J	CHIP R 100K J 1/16W		R591,592			RK73HB1J331J	CHIP R 330 J 1/16W	
R511			RK73HB1J470J	CHIP R 47 J 1/16W		R593			RK73HB1J334J	CHIP R 330K J 1/16W	
R512			RN73HH1J473D	CHIP R 47K D 1/16W		R594			RK73HB1J331J	CHIP R 330 J 1/16W	
R514			RK73HB1J104J	CHIP R 100K J 1/16W		R595			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R515			RK73HB1J223J	CHIP R 22K J 1/16W		R596			RK73HB1J331J	CHIP R 330 J 1/16W	
R517			RK73HB1J563J	CHIP R 56K J 1/16W		R597			RK73HB1J470J	CHIP R 47 J 1/16W	
R518			RK73HB1J103J	CHIP R 10K J 1/16W		R598,599			RK73HB1J104J	CHIP R 100K J 1/16W	
R519			RN73HH1J103D	CHIP R 10K D 1/16W		R600			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R523			RK73HB1J103J	CHIP R 10K J 1/16W		R601			RK73HB1J103J	CHIP R 10K J 1/16W	

## PARTS LIST

## CONTROL UNIT (X53-4400-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R602			RK73HB1J472J	CHIP R 4.7K J 1/16W		R758			RK73HB1J151J	CHIP R 150 J 1/16W	
R603			RK73HB1J104J	CHIP R 100K J 1/16W		R761			RK73HB1J220J	CHIP R 22 J 1/16W	
R604			RK73HB1J472J	CHIP R 4.7K J 1/16W		R762			RK73HB1J101J	CHIP R 100 J 1/16W	
R605			RK73HB1J102J	CHIP R 1.0K J 1/16W		R763			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R606			RK73HB1J104J	CHIP R 100K J 1/16W		R764			RK73HB1J220J	CHIP R 22 J 1/16W	
R608			RK73HB1J104J	CHIP R 100K J 1/16W		R765			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R611			RK73HB1J471J	CHIP R 470 J 1/16W		R766			RK73HB1J101J	CHIP R 100 J 1/16W	
R613			RK73HB1J104J	CHIP R 100K J 1/16W		R767,768			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R614			RK73HB1J563J	CHIP R 56K J 1/16W		R770			RK73HB1J474J	CHIP R 470K J 1/16W	
R615-618			RK73HB1J104J	CHIP R 100K J 1/16W		R771-778			RK73HB1J101J	CHIP R 100 J 1/16W	
R619			RK73HB1J274J	CHIP R 270K J 1/16W		R779			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R620			RK73HB1J470J	CHIP R 47 J 1/16W		R780			RK73HB1J104J	CHIP R 100K J 1/16W	
R621			RK73HB1J104J	CHIP R 100K J 1/16W		R781			RK73HB1J101J	CHIP R 100 J 1/16W	
R622			RK73HB1J470J	CHIP R 47 J 1/16W		R785			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R623			RK73HB1J104J	CHIP R 100K J 1/16W		R786			RK73HB1J101J	CHIP R 100 J 1/16W	
R624,625			RK73HB1J470J	CHIP R 47 J 1/16W		R787,788			RK73HB1J104J	CHIP R 100K J 1/16W	
R626			RK73HB1J474J	CHIP R 470K J 1/16W		R790			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R627			RK73HB1J104J	CHIP R 100K J 1/16W		R792			RK73HB1J101J	CHIP R 100 J 1/16W	
R628			RK73HB1J274J	CHIP R 270K J 1/16W		R794-796			RK73HB1J101J	CHIP R 100 J 1/16W	
R629			RK73HB1J470J	CHIP R 47 J 1/16W		R797			RK73HB1J104J	CHIP R 100K J 1/16W	
R630			RK73HB1J103J	CHIP R 10K J 1/16W		R799			RK73HB1J224J	CHIP R 220K J 1/16W	
R631			RK73HB1J474J	CHIP R 470K J 1/16W		R802			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R632			RK73HB1J103J	CHIP R 10K J 1/16W		R804			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R634			RK73FB2B000J	CHIP R 0.0 J 1/8W		R805			RK73HB1J474J	CHIP R 470K J 1/16W	
R635			RK73HB1J274J	CHIP R 270K J 1/16W		R806,807			RK73HB1J104J	CHIP R 100K J 1/16W	
R636			RK73HB1J104J	CHIP R 100K J 1/16W		R809-820			RK73HB1J104J	CHIP R 100K J 1/16W	
R637			RK73HB1J103J	CHIP R 10K J 1/16W		R822-826			RK73HB1J101J	CHIP R 100 J 1/16W	
R642			RK73HB1J102J	CHIP R 1.0K J 1/16W		R827			RK73HB1J104J	CHIP R 100K J 1/16W	
R658			RK73HB1J102J	CHIP R 1.0K J 1/16W		R828			RK73HB1J101J	CHIP R 100 J 1/16W	
R664			RK73HB1J104J	CHIP R 100K J 1/16W		R829			RK73HB1J104J	CHIP R 100K J 1/16W	
R665			RK73GB2A105J	CHIP R 1.0M J 1/10W		R831			RK73HB1J103J	CHIP R 10K J 1/16W	
R668			RK73HB1J223J	CHIP R 22K J 1/16W		R832,833			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R669			RK73HB1J823J	CHIP R 82K J 1/16W		R835			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R670			RK73HB1J104J	CHIP R 100K J 1/16W							
R671			RK73HB1J473J	CHIP R 47K J 1/16W		<b>K500</b>	2B		S76-0434-05	RELAY	
R675			RN73HH1J103D	CHIP R 10K D 1/16W		D1			02DZ18F-X	ZENER DIODE	
R676			RN73HH1J473D	CHIP R 47K D 1/16W		D2			1SS388F	DIODE	
R700			RK73FB2B000J	CHIP R 0.0 J 1/8W		D3			1SS416	DIODE	
R703			RK73HB1J104J	CHIP R 100K J 1/16W		D4			HSC119	DIODE	
R706			RK73FB2B000J	CHIP R 0.0 J 1/8W		D5			MA2S111-F	DIODE	
R707			RK73HB1J104J	CHIP R 100K J 1/16W		D6			CRS02-0	DIODE	
R711			RK73HB1J474J	CHIP R 470K J 1/16W		D7			1SS301F	DIODE	
R713			RK73HB1J220J	CHIP R 22 J 1/16W		D8			1SS388F	DIODE	
R714,715			RK73HB1J104J	CHIP R 100K J 1/16W		D10,11			1SS388F	DIODE	
R716,717			RK73HB1J473J	CHIP R 47K J 1/16W		D400-405			DA204U	DIODE	
R718			RK73HB1J474J	CHIP R 470K J 1/16W		D406-409			1SS388F	DIODE	
R719			RK73HB1J104J	CHIP R 100K J 1/16W		D410			02DZ5.1F-Y	ZENER DIODE	
R721			RK73HB1J104J	CHIP R 100K J 1/16W		D411,412			AVRM16270K2AB	VARISTOR	
R725			RK73HB1J104J	CHIP R 100K J 1/16W		D413-421			DA204U	DIODE	
R727			RK73HB1J101J	CHIP R 100 J 1/16W		D422,423			AVRM16270K2AB	VARISTOR	
R734			RK73HB1J101J	CHIP R 100 J 1/16W		D424,425			1SS355	DIODE	
R736,737			RK73HB1J101J	CHIP R 100 J 1/16W		D426-428			02DZ18F-X	ZENER DIODE	
R738			RK73HB1J104J	CHIP R 100K J 1/16W		D429,430			02DZ5.1F-Y	ZENER DIODE	
R740,741			RK73HB1J104J	CHIP R 100K J 1/16W		D500,501			RB706F-40	DIODE	
R742			RK73HB1J101J	CHIP R 100 J 1/16W		D502			02DZ18F-X	ZENER DIODE	
R743-747			RK73HB1J104J	CHIP R 100K J 1/16W		D503			1SS355	DIODE	
R749			RK73HB1J104J	CHIP R 100K J 1/16W		D504,505			AVRM16270K2AB	VARISTOR	
R750			RK73HB1J473J	CHIP R 47K J 1/16W		D506			MINISMDC075F24	VARISTOR	
R751-754			RK73HB1J104J	CHIP R 100K J 1/16W		D507,508			AVRM16270K2AB	VARISTOR	
R757			RK73HB1J104J	CHIP R 100K J 1/16W		D509			MA2S111-F	DIODE	

## PARTS LIST

CONTROL UNIT (X53-4400-10)

TX-RX UNIT (X57-7610-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination	
D510			AVRM16270K2AB	VARIATOR		Q205			SSM3K15TE(F)	FET		
D512			1SS388F	DIODE		Q206			RT1N140U-T111	TRANSISTOR		
IC1			XC6108C23CMN	MOS-IC		Q400,401			RT1N144U-T111	TRANSISTOR		
IC2			XC6204B332P1	ANALOGUE IC		Q402,403			2SD2114K(W)	TRANSISTOR		
IC3			TA7805FQ	MOS-IC		Q501			2SC4738(GR)F	TRANSISTOR		
IC4			LT1616ES6-PBF	ANALOGUE IC		Q502			2SA1832(GR)F	TRANSISTOR		
IC5	2A		LM2940T-8.0	MOS-IC		Q503			2SJ243-A	FET		
IC7			XC6204B332M	MOS-IC		Q504			RT1N141U-T111	TRANSISTOR		
IC8			XC6205B152PRN	ANALOGUE IC		Q505			2SJ243-A	FET		
IC9			XC6204B332M	MOS-IC		Q506			2SD1757K	TRANSISTOR		
IC100			MCP6021-E/OT	MOS-IC		Q507			RT1N441U-T111	TRANSISTOR		
IC101-103			TC75W51FUF	MOS-IC		Q508			2SJ243-A	FET		
IC200			TC7S08FU-F	MOS-IC		Q509			RT1N141U-T111	TRANSISTOR		
IC201			TC7SET08FU-F	MOS-IC		Q510			RT1N140U-T111	TRANSISTOR		
IC202-206		*	TC74VHCT244AFK	MOS-IC		<b>TX-RX UNIT (X57-7610-10)</b>						
IC207			TC74LCX245FK	MOS-IC		C3			CC73GCH1H470J	CHIP C	47PF	J
IC208			TC7MBD3245AFK	MOS-IC		C5,6			CC73GCH1H470J	CHIP C	47PF	J
IC400			PCA9535BS	MOS-IC		C8			C92-0891-05	ELECTRO	330U	25WV
IC401			ADM202EARNZ	MOS-IC		C11,12			CC73GCH1H470J	CHIP C	47PF	J
IC501-503			TC75W51FUF	MOS-IC		C14	*		C93-1759-05	CERAMIC	2.2P	500WV
IC505			TC75W51FUF	MOS-IC		C15,16			CC73GCH1H470J	CHIP C	47PF	J
IC506			TC7W53FK(F)	MOS-IC		C17			CC73FCH1H040B	CHIP C	4.0PF	B
IC507			TC75W51FUF	MOS-IC		C18			CK73GB1C104K	CHIP C	0.10UF	K
IC508,509			TC7W53FK(F)	MOS-IC		C19			CK73GB1C683K	CHIP C	0.068UF	K
IC510			TC75W51FUF	MOS-IC		C20	*		C93-1794-05	CERAMIC	47P	500WV
IC511			TC7W53FK(F)	MOS-IC		C21			CC73GCH1H470J	CHIP C	47PF	J
IC512			TC75W51FUF	MOS-IC		C22 -24	*		C93-1761-05	CERAMIC	3P	500WV
IC513			TC7S66FUF	MOS-IC		C25			CC73FCH1H470J	CHIP C	47PF	J
IC514			TC75W51FUF	MOS-IC		C34			CC73FCH1H470J	CHIP C	47PF	J
IC515			TC7S66FUF	MOS-IC		C40,41			CK73GB1H471K	CHIP C	470PF	K
IC516			TA75S01F-F	MOS-IC		C42	*		C93-1761-05	CERAMIC	3P	500WV
IC517			M62364FP-F	MOS-IC		C46	*		C93-1759-05	CERAMIC	2.2P	500WV
IC518			TC7W53FK(F)	MOS-IC		C47,48			CK73GB1H471K	CHIP C	470PF	K
IC519			TA75W01FUF	MOS-IC		C49,50			C92-0891-05	ELECTRO	330U	25WV
IC520			TC75W51FUF	MOS-IC		C54			CC73GCH1H470J	CHIP C	47PF	J
IC521			LMC7101BIM5	MOS-IC		C55	*		C93-1761-05	CERAMIC	3P	500WV
IC522	2A		TDA8561Q	BI-POLAR IC		C58,59			CC73GCH1H470J	CHIP C	47PF	J
IC523			LMC7101BIM5	MOS-IC		C61	*		C93-1780-05	CERAMIC	12P	500WV
IC524,525			TC75S51FE(F)	MOS-IC		C62,63			CC73GCH1H470J	CHIP C	47PF	J
IC700		*	<b>Note 1</b> (BGA)	ROM IC		C64			CC73FCH1H470J	CHIP C	47PF	J
IC701			<b>Note 1</b> (BGA)	MICRO CNTRL UNIT		C66	*		C93-1778-05	CERAMIC	10P	500WV
IC702			LM73CIMXK-0	MOS-IC		C67	*		C93-1755-05	CERAMIC	1.2P	500WV
IC703		*	<b>Note 1</b> (BGA)	SRAM IC		C68			CC73FCH1H020B	CHIP C	2.0PF	B
IC704			RV5C386A	MOS-IC		C69			CC73GCH1H470J	CHIP C	47PF	J
IC705			XC6109C29ANN	ANALOGUE IC		C70			CC73GCH1H180J	CHIP C	18PF	J
IC706			TC7SH08FU-F	MOS-IC		C71,72			CC73GCH1H050B	CHIP C	5.0PF	B
IC707			SM5023CNDH-G	MOS-IC		C73			CC73GCH1H180J	CHIP C	18PF	J
IC708			<b>Note 1</b> (BGA)	MOS-IC		C74,75			CC73GCH1H050B	CHIP C	5.0PF	B
Q1,2			RT1N141U-T111	TRANSISTOR		C76 -79			CC73GCH1H180J	CHIP C	18PF	J
Q3			2SJ645	FET		C80	*		C92-0949-05	CHIP TNL	4.7UF	16WV
Q4			SSM3K15TE(F)	FET		C85,86			CC73GCH1H050B	CHIP C	5.0PF	B
Q5			2SA1955A-F	TRANSISTOR		C150			CC73GCH1H060B	CHIP C	6.0PF	B
Q6			SSM3K15TE(F)	FET		C151,152			CC73GCH1H470J	CHIP C	47PF	J
Q7			2SA1955A-F	TRANSISTOR		C153			CC73GCH1H060B	CHIP C	6.0PF	B
Q8,9			SSM3K15TE(F)	FET		C154			CC73GCH1H470J	CHIP C	47PF	J
Q10,11			2SA1955A-F	TRANSISTOR		C155			CC73GCH1H040B	CHIP C	4.0PF	B
Q12,13			RN47A4-F	TRANSISTOR								
Q200,201			SSM3K15TE(F)	FET								
Q203			SSM3K15TE(F)	FET								
Q204			RT1N140U-T111	TRANSISTOR								

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

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

## PARTS LIST

## TX-RX UNIT (X57-7610-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C156			CC73GCH1H101J	CHIP C 100PF J		C265,266			CC73GCH1H470J	CHIP C 47PF J	
C157			CC73GCH1H100C	CHIP C 10PF C		C267			CK73GB1H103K	CHIP C 0.010UF K	
C158			CC73GCH1H040B	CHIP C 4.0PF B		C268			CC73GCH1H101J	CHIP C 100PF J	
C159			CC73GCH1H470J	CHIP C 47PF J		C269			CC73GCH1H150J	CHIP C 15PF J	
C160			CC73GCH1H070B	CHIP C 7.0PF B		C270			CK73GB1H103K	CHIP C 0.010UF K	
C161			CC73GCH1H101J	CHIP C 100PF J		C271			CK73GB1H102K	CHIP C 1000PF K	
C162			CE32BC1D470M	ELECTRO 47UF 20WV		C272,273			CK73GB1H103K	CHIP C 0.010UF K	
C163			CC73GCH1H010B	CHIP C 1.0PF B		C274			CC73GCH1H470J	CHIP C 47PF J	
C164			CC73GCH1H470J	CHIP C 47PF J		C275			CK73GB1H103K	CHIP C 0.010UF K	
C165			CC73GCH1H100C	CHIP C 10PF C		C276			CC73GCH1H470J	CHIP C 47PF J	
C166			CC73GCH1H470J	CHIP C 47PF J		C277			CK73GB1H103K	CHIP C 0.010UF K	
C167			CC73FCH1H470J	CHIP C 47PF J		C279			CC73GCH1H220G	CHIP C 22PF G	
C168			CK73GB1C104K	CHIP C 0.10UF K		C280,281			CK73GB1H103K	CHIP C 0.010UF K	
C169			CC73GCH1H470J	CHIP C 47PF J		C282			CC73GCH1H180J	CHIP C 18PF J	
C170			CC73GCH1H020B	CHIP C 2.0PF B		C283			CC73GCH1H150J	CHIP C 15PF J	
C171			CC73GCH1H060B	CHIP C 6.0PF B		C284			CC73GCH1H070B	CHIP C 7.0PF B	
C172			CC73GCH1H040B	CHIP C 4.0PF B		C285,286			CK73GB1H102K	CHIP C 1000PF K	
C173			CC73GCH1H100C	CHIP C 10PF C		C288,289			CK73GB1C104K	CHIP C 0.10UF K	
C174			CK73GB1C104K	CHIP C 0.10UF K		C291			CC73GCH1H470J	CHIP C 47PF J	
C176,177			CK73GB1C104K	CHIP C 0.10UF K		C292			CC73GCH1H010B	CHIP C 1.0PF B	
C202			CK73GB1H103K	CHIP C 0.010UF K		C293,294			CK73GB1H103K	CHIP C 0.010UF K	
C204			CK73GB1H103K	CHIP C 0.010UF K		C297			CC73GCH1H220G	CHIP C 22PF G	
C205			CC73GCH1H470J	CHIP C 47PF J		C298,299			CK73GB1C104K	CHIP C 0.10UF K	
C207,208			CC73GCH1H470J	CHIP C 47PF J		C301			CC73GCH1H150J	CHIP C 15PF J	
C209			CC73GCH1H151J	CHIP C 150PF J		C303			CC73GCH1H150J	CHIP C 15PF J	
C210,211			CC73GCH1H470J	CHIP C 47PF J		C304			CC73GCH1H470J	CHIP C 47PF J	
C212			CC73GCH1H680J	CHIP C 68PF J		C305			CK73GB1H103K	CHIP C 0.010UF K	
C213			CC73GCH1H470J	CHIP C 47PF J		C306			CC73GCH1H101J	CHIP C 100PF J	
C215,216			CK73GB1H103K	CHIP C 0.010UF K		C307			CC73GCH1H070B	CHIP C 7.0PF B	
C217,218			CC73GCH1H470J	CHIP C 47PF J		C309-315			CK73GB1C104K	CHIP C 0.10UF K	
C219			CC73GCH1H020B	CHIP C 2.0PF B		C316			CK73FB0J106K	CHIP C 10UF K	
C220			CC73GCH1H151J	CHIP C 150PF J		C318			CC73GCH1H110G	CHIP C 11PF G	
C224			CC73GCH1H020B	CHIP C 2.0PF B		C319			CC73GCH1H150J	CHIP C 15PF J	
C226			CC73GCH1H020B	CHIP C 2.0PF B		C320			CK73GB1C104K	CHIP C 0.10UF K	
C233			CC73GCH1H470J	CHIP C 47PF J		C321,322			CK73GB1H103K	CHIP C 0.010UF K	
C234			CC73GCH1H090B	CHIP C 9.0PF B		C323			CC73GCH1H030B	CHIP C 3.0PF B	
C235			CC73GCH1H150J	CHIP C 15PF J		C324			CK73GB1C104K	CHIP C 0.10UF K	
C236			CK73GB1H471K	CHIP C 470PF K		C325			CK73GB1H103K	CHIP C 0.010UF K	
C238,239			CC73GCH1H470J	CHIP C 47PF J		C326			CS77BA0J100M	CHIP TNL 10UF 6.3WV	
C240			CK73GB1H104K	CHIP C 0.10UF K		C327			CC73GCH1H181J	CHIP C 180PF J	
C241			CC73GCH1H470J	CHIP C 47PF J		C328			CC73GCH1H270G	CHIP C 27PF G	
C242			CK73GB1H102K	CHIP C 1000PF K		C329			CK73GB1C104K	CHIP C 0.10UF K	
C243,244			CK73GB1H103K	CHIP C 0.010UF K		C330			CC73GCH1H181J	CHIP C 180PF J	
C245			CC73GCH1H040B	CHIP C 4.0PF B		C331			CK73GB1H152J	CHIP C 1500PF J	
C246			CC73GCH1H100C	CHIP C 10PF C		C332			CK73GB1H102K	CHIP C 1000PF K	
C247			CC73GCH1H270G	CHIP C 27PF G		C333			CK73GB1C333K	CHIP C 0.033UF K	
C249			CC73GCH1H470J	CHIP C 47PF J		C334			CK73GB1C104K	CHIP C 0.10UF K	
C250			CK73GB1H103K	CHIP C 0.010UF K		C335	*		CS77BA0J220M	CHIP TNL 22UF 6.3WV	
C251			CC73GCH1H030B	CHIP C 3.0PF B		C336			CK73GB1H102K	CHIP C 1000PF K	
C252			CC73GCH1H050B	CHIP C 5.0PF B		C337,338			CK73GB1C104K	CHIP C 0.10UF K	
C253			CC73GCH1H030B	CHIP C 3.0PF B		C339			CC73GCH1H180J	CHIP C 18PF J	
C254			CC73GCH1H060B	CHIP C 6.0PF B		C340			CK73GB1H102K	CHIP C 1000PF K	
C255			CC73GCH1H330G	CHIP C 33PF G		C341			CK73GB1C104K	CHIP C 0.10UF K	
C257,258			CK73GB1H103K	CHIP C 0.010UF K		C342			CK73GB1C224K	CHIP C 0.22UF K	
C259			CC73GCH1H150J	CHIP C 15PF J		C349			CC73GCH1H150J	CHIP C 15PF J	
C260			CC73GCH1H040B	CHIP C 4.0PF B		C350			CC73GCH1H101J	CHIP C 100PF J	
C261			CC73GCH1H470J	CHIP C 47PF J		C351			CC73GCH1H470J	CHIP C 47PF J	
C262			CC73GCH1H220G	CHIP C 22PF G		C352			CC73GCH1H020B	CHIP C 2.0PF B	
C263			CC73GCH1H060B	CHIP C 6.0PF B		C353			CC73GCH1H271J	CHIP C 270PF J	
C264			CK73GB1H103K	CHIP C 0.010UF K		C354,355			CC73GCH1H470J	CHIP C 47PF J	

## PARTS LIST

TX-RX UNIT (X57-7610-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C356			CC73GCH1H2R5B	CHIP C 2.5PF B		C484			CK73GB1H471K	CHIP C 470PF K	
C357			CC73GCH1H271J	CHIP C 270PF J		C485			CC73GCH1H330G	CHIP C 33PF G	
C358			CC73GCH1H470J	CHIP C 47PF J		C486			CC73GCH1H0R5B	CHIP C 0.5PF B	
C359,360			CK73GB1C104K	CHIP C 0.10UF K		C487			CK73GB1H471K	CHIP C 470PF K	
C400			CK73GB1H471K	CHIP C 470PF K		C488			CC73GCH1H050B	CHIP C 5.0PF B	
C401			CK73GB1H103K	CHIP C 0.010UF K		C489			CC73GCH1H330G	CHIP C 33PF G	
C402,403			CC73GCH1H101J	CHIP C 100PF J		C490			CS77BA1A100M	CHIP TNTL 10UF 10WV	
C404			CK73GB1C104K	CHIP C 0.10UF K		C491			CC73GCH1H0R5B	CHIP C 0.5PF B	
C406			CK73GB1H103K	CHIP C 0.010UF K		C492			CK73GB1H471K	CHIP C 470PF K	
C407			CC73GCH1H101J	CHIP C 100PF J		C493			CC73GCH1H020B	CHIP C 2.0PF B	
C408			CK73GB1H471K	CHIP C 470PF K		C494			CC73GCH1H060B	CHIP C 6.0PF B	
C409			CC73GCH1H101J	CHIP C 100PF J		C495			CC73GCH1H020B	CHIP C 2.0PF B	
C410			CK73GB1H471K	CHIP C 470PF K		C496			CC73GCH1H330G	CHIP C 33PF G	
C412,413			CC73GCH1H101J	CHIP C 100PF J		C497			CC73GCH1H0R5B	CHIP C 0.5PF B	
C414			CC73GCH1H470J	CHIP C 47PF J		C498			CC73GCH1H1R5B	CHIP C 1.5PF B	
C415			C92-0863-05	CHIP TNTL 0.047UF 35WV		C499			CC73GCH1H060B	CHIP C 6.0PF B	
C416			CS77CA1ER47M	CHIP TNTL 0.47UF 25WV		C500			CK73GB1H471K	CHIP C 470PF K	
C417			C92-0863-05	CHIP TNTL 0.047UF 35WV		C502			CC73GCH1H2R5B	CHIP C 2.5PF B	
C418			CK73GB1C104K	CHIP C 0.10UF K		C503		*	CS77B21A220M	CHIP TNTL 22UF 10WV	
C419,420			CC73GCH1H470J	CHIP C 47PF J		C504		*	CS77BC1A470M	CHIP TNTL 47UF 10WV	
C423			CK73GB1H103K	CHIP C 0.010UF K		C505			CK73GB1H103K	CHIP C 0.010UF K	
C424			CK73GB1C104K	CHIP C 0.10UF K		C506			CK73GB1H471K	CHIP C 470PF K	
C425			CC73GCH1H101J	CHIP C 100PF J		C507			CC73GCH1H020B	CHIP C 2.0PF B	
C427			CK73GB1H102K	CHIP C 1000PF K		C508			CK73GB1H471K	CHIP C 470PF K	
C429			CK73GB1C104K	CHIP C 0.10UF K		C509			CC73GCH1H050B	CHIP C 5.0PF B	
C430			CK73GB1H471K	CHIP C 470PF K		C510			CC73GCH1H070B	CHIP C 7.0PF B	
C431			CK73GB1H103K	CHIP C 0.010UF K		C511			CC73GCH1H060B	CHIP C 6.0PF B	
C432,433			CK73GB1C104K	CHIP C 0.10UF K		C512			CC73GCH1H0R5B	CHIP C 0.5PF B	
C434			CK73GB1H471K	CHIP C 470PF K		C513			CK73GB1H471K	CHIP C 470PF K	
C435			CC73GCH1H080B	CHIP C 8.0PF B		C514			CC73GCH1H070B	CHIP C 7.0PF B	
C436			CC73GCH1H060B	CHIP C 6.0PF B		C515			CC73GCH1H0R5B	CHIP C 0.5PF B	
C437			CC73GCH1H470J	CHIP C 47PF J		C516,517			CC73GCH1H070B	CHIP C 7.0PF B	
C438			CC73GCH1H050B	CHIP C 5.0PF B		C518			CC73GCH1H0R5B	CHIP C 0.5PF B	
C439			CC73GCH1H470J	CHIP C 47PF J		C519,520			CK73GB1H471K	CHIP C 470PF K	
C441			CC73GCH1H2R5B	CHIP C 2.5PF B		C521			CC73GCH1H080B	CHIP C 8.0PF B	
C442			CC73GCH1H020B	CHIP C 2.0PF B		C522,523			CC73GCH1H090B	CHIP C 9.0PF B	
C443			CC73GCH1H050B	CHIP C 5.0PF B		C524			CC73GCH1H0R5B	CHIP C 0.5PF B	
C444,445			CK73GB1E105K	CHIP C 1.0UF K		C527			CC73GCH1H060B	CHIP C 6.0PF B	
C446		*	CS77BB21D4R7M	CHIP TNTL 4.7UF 20WV		C528			CS77BA1A100M	CHIP TNTL 10UF 10WV	
C447			CC73GCH1H101J	CHIP C 100PF J		C529			CK73GB1H471K	CHIP C 470PF K	
C448,449			CK73GB1C104K	CHIP C 0.10UF K		C530			CC73GCH1H470J	CHIP C 47PF J	
C450			CK73GB1E105K	CHIP C 1.0UF K		C531,532			CK73GB1H471K	CHIP C 470PF K	
C451-456			CK73GB1H471K	CHIP C 470PF K		C537			CC73GCH1H080B	CHIP C 8.0PF B	
C457			CC73GCH1H020B	CHIP C 2.0PF B		C540			CC73GCH1H101J	CHIP C 100PF J	
C458			CC73GCH1H2R5B	CHIP C 2.5PF B		C541,542			CC73GCH1H470J	CHIP C 47PF J	
C459			CC73GCH1H470J	CHIP C 47PF J		C544			CK73GB1H471K	CHIP C 470PF K	
C460			CK73GB1E105K	CHIP C 1.0UF K		C545			CK73GB1C104K	CHIP C 0.10UF K	
C461			CC73GCH1H181J	CHIP C 180PF J		C546,547			CK73GB1H471K	CHIP C 470PF K	
C463			CK73GB1H471K	CHIP C 470PF K		C548			CC73GCH1H100C	CHIP C 10PF C	
C464			CC73GCH1H101J	CHIP C 100PF J		C549			CC73GCH1H101J	CHIP C 100PF J	
C465			CC73GCH1H220G	CHIP C 22PF G		C550			CK73GB1H472K	CHIP C 4700PF K	
C466-468			CK73GB1E105K	CHIP C 1.0UF K		C551			CC73GCH1H470J	CHIP C 47PF J	
C470-472			CK73GB1H471K	CHIP C 470PF K		C552			CK73GB1C104K	CHIP C 0.10UF K	
C474			CK73GB1H103K	CHIP C 0.010UF K		C553			CK73GB1H472K	CHIP C 4700PF K	
C475			C93-0787-05	CERAMIC 0.1UF 50WV		C554			CC73GCH1H470J	CHIP C 47PF J	
C477			CK73GB1H103K	CHIP C 0.010UF K		C555			CC73GCH1H020B	CHIP C 2.0PF B	
C478		*	CS77BC1D220M	CHIP TNTL 22UF 20WV		C556			CC73GCH1H100C	CHIP C 10PF C	
C479			CK73GB1H471K	CHIP C 470PF K		C557			CC73GCH1H070B	CHIP C 7.0PF B	
C480		*	CS77BC1D220M	CHIP TNTL 22UF 20WV		C558			CC73GCH1H1R5B	CHIP C 1.5PF B	
C482,483			CK73GB1H103K	CHIP C 0.010UF K		C559			CC73GCH1H050B	CHIP C 5.0PF B	

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### TX-RX UNIT (X57-7610-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C560			CC73GCH1H470J	CHIP C 47PF J		L200,201		*	L79-1932-05	DIELECTRIC FILTER (770MHZ)	
C562			CC73GCH1H020B	CHIP C 2.0PF B		L202,203		*	L79-1931-05	DIELECTRIC FILTER (860MHZ)	
C563			CC73GCH1H050B	CHIP C 5.0PF B		L204			L41-1075-08	SMALL FIXED INDUCTOR (10NH)	
C564			CC73GCH1H030B	CHIP C 3.0PF B		L205		*	L41-8268-08	SMALL FIXED INDUCTOR (8.2NH)	
C566			CC73GCH1H010B	CHIP C 1.0PF B		L206,207			L92-0140-05	CHIP FERRITE	
C567			CC73GCH1H470J	CHIP C 47PF J		L208			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)	
C568			CK73GB1H471K	CHIP C 470PF K		L211,212			L41-1085-08	SMALL FIXED INDUCTOR (100NH)	
C569			CC73GCH1H0R5B	CHIP C 0.5PF B		L215			L41-1878-14	SMALL FIXED INDUCTOR (18NH)	
C570			CK73GB1H471K	CHIP C 470PF K		L216			L92-0140-05	CHIP FERRITE	
C571			CC73GCH1H0R5B	CHIP C 0.5PF B		L217			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)	
C572,573			CK73GB1H471K	CHIP C 470PF K		L218			L41-1878-14	SMALL FIXED INDUCTOR (18NH)	
C574			CS77BA1A100M	CHIP TNTL 10UF 10WV		L220,221			L41-1075-08	SMALL FIXED INDUCTOR (10NH)	
C575			CK73GB1H471K	CHIP C 470PF K		L225			L40-5681-37	SMALL FIXED INDUCTOR (0.560UH)	
C600			CC73GCH1H470J	CHIP C 47PF J		L226			L41-1008-08	SMALL FIXED INDUCTOR (10UH)	
C601			C92-0881-05	ELECTRO 47UF 10WV		L227			L41-1075-08	SMALL FIXED INDUCTOR (10NH)	
C602			CC73GCH1H470J	CHIP C 47PF J		L231			L41-1008-08	SMALL FIXED INDUCTOR (10UH)	
C603			CK73GB1H471K	CHIP C 470PF K		L232			L40-1881-37	SMALL FIXED INDUCTOR (0.180UH)	
C604			CS77CA1C010M	CHIP TNTL 1.0UF 16WV		L234			L34-4725-05	COIL	
C605			CK73GB1H103K	CHIP C 0.010UF K		L235,236		*	L34-4897-05	COIL	
C606			C92-0887-05	ELECTRO 1.0UF 50WV		L237		*	L34-4898-05	COIL	
C607,608			CK73GB1C104K	CHIP C 0.10UF K		L238-240		*	L34-4897-05	COIL	
C609		*	C92-0949-05	CHIP TNTL 4.7UF 16WV		L241		*	L34-4898-05	COIL	
C610-620			CC73GCH1H470J	CHIP C 47PF J		L242		*	L34-4897-05	COIL	
C621			CK73GB1H102K	CHIP C 1000PF K		L243			L41-3363-14	SMALL FIXED INDUCTOR (3.3NH)	
C622-630			CC73GCH1H470J	CHIP C 47PF J		L244			L41-6868-14	SMALL FIXED INDUCTOR (6.8NH)	
C631,632			CK73GB1H102K	CHIP C 1000PF K		L245			L41-5668-14	SMALL FIXED INDUCTOR (5.6NH)	
C634			CC73GCH1H470J	CHIP C 47PF J		L246			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)	
C636,637			CK73GB1H104K	CHIP C 0.10UF K		L401			L40-8265-92	SMALL FIXED INDUCTOR (8.2NH)	
C638			CC73GCH1H470J	CHIP C 47PF J		L402,403			L41-1578-14	SMALL FIXED INDUCTOR (15NH)	
C644-647			CC73GCH1H470J	CHIP C 47PF J		L405			L41-6868-14	SMALL FIXED INDUCTOR (6.8NH)	
C648			CC73GCH1H040B	CHIP C 4.0PF B		L406			L33-1462-05	SMALL FIXED INDUCTOR (68UH)	
C649,650			CC73GCH1H470J	CHIP C 47PF J		L407			L41-6868-14	SMALL FIXED INDUCTOR (6.8NH)	
C651			CK73GB1E105K	CHIP C 1.0UF K		L408-417			L92-0140-05	CHIP FERRITE	
C653,654			CC73GCH1H470J	CHIP C 47PF J		L418-423			L41-1098-08	SMALL FIXED INDUCTOR (1.0UH)	
						L424			L92-0140-05	CHIP FERRITE	
CN10	1A	*	E23-1338-05	TERMINAL							
CN13			E41-2672-05	PIN ASSY		L425-430			L41-1098-08	SMALL FIXED INDUCTOR (1.0UH)	
CN14			E23-1290-05	RELAY TERMINAL		L431			L34-4609-15	AIR-CORE COIL	
CN202			E41-2735-05	PIN ASSY		L432,433			L41-1098-08	SMALL FIXED INDUCTOR (1.0UH)	
CN207			E41-2735-05	PIN ASSY		L434			L34-4609-15	AIR-CORE COIL	
						L435,436			L41-1098-08	SMALL FIXED INDUCTOR (1.0UH)	
CN600			E40-6438-05	FLAT CABLE CONNECTOR							
W400			E37-1235-05	JUMPER WIRE		L437			L34-4609-15	AIR-CORE COIL	
CF200			L72-1018-05	CERAMIC FILTER		L438,439			L41-1098-08	SMALL FIXED INDUCTOR (1.0UH)	
CF201,202			L72-1016-05	CERAMIC FILTER		L440			L40-2275-92	SMALL FIXED INDUCTOR (22NH)	
CF204			L72-1018-05	CERAMIC FILTER		L441			L40-1875-92	SMALL FIXED INDUCTOR (18NH)	
L2			L34-4613-05	AIR-CORE COIL		L444			L40-1275-92	SMALL FIXED INDUCTOR (12NH)	
L3			L34-4603-15	AIR-CORE COIL		L445,446			L92-0140-05	CHIP FERRITE	
						L447,448			L41-1578-14	SMALL FIXED INDUCTOR (15NH)	
L4,5			L34-4604-15	AIR-CORE COIL		L450,451			L41-5668-14	SMALL FIXED INDUCTOR (5.6NH)	
L8			L34-4604-15	AIR-CORE COIL		L452,453			L40-1875-92	SMALL FIXED INDUCTOR (18NH)	
L9			L41-2775-33	SMALL FIXED INDUCTOR (0.027UH)		L454			L40-1275-92	SMALL FIXED INDUCTOR (12NH)	
L10			L41-3375-33	SMALL FIXED INDUCTOR (0.033UH)							
L150			L40-6865-92	SMALL FIXED INDUCTOR (6.8NH)		L455			L40-1575-92	SMALL FIXED INDUCTOR (15NH)	
						L456			L40-2263-92	SMALL FIXED INDUCTOR (2.2NH)	
L151			L40-1563-92	SMALL FIXED INDUCTOR (1.5NH)		L457			L40-1863-92	SMALL FIXED INDUCTOR (1.8NH)	
L152			L40-6865-92	SMALL FIXED INDUCTOR (6.8NH)		X400		*	L77-3048-05	VCXO (24.2MZ)	
L153			L40-2263-92	SMALL FIXED INDUCTOR (2.2NH)		XF202	2A	*	L71-0652-05	CRYSTAL FILTER (73.05MHZ NARROW)	
L156			L40-8265-92	SMALL FIXED INDUCTOR (8.2NH)							
L157			L40-5663-92	SMALL FIXED INDUCTOR (5.6NH)		XF204	2A	*	L71-0653-05	CRYSTAL FILTER (73.05MHZ WIDE)	
L158			L40-2763-92	SMALL FIXED INDUCTOR (2.7NH)		R1			RK73FB2B821J	CHIP R 820 J 1/8W	
L159			L40-1563-92	SMALL FIXED INDUCTOR (1.5NH)		R2,3			RK73FB2B100J	CHIP R 10 J 1/8W	
L160,161			L40-8265-92	SMALL FIXED INDUCTOR (8.2NH)		R4			RK73FB2B821J	CHIP R 820 J 1/8W	

## PARTS LIST

TX-RX UNIT (X57-7610-10)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
R5			RK73GB2A103J	CHIP R 10K J 1/10W		R233			RK73FB2B331J	CHIP R 330 J 1/8W	
R6			RK73GB2A102J	CHIP R 1.0K J 1/10W		R236			RK73GB2A390J	CHIP R 39 J 1/10W	
R7			RK73GB2A000J	CHIP R 0.0 J 1/10W		R237			RK73GB2A153J	CHIP R 15K J 1/10W	
R9			RK73PB2H101J	CHIP R 100 J 1/2W		R239			RK73GB2A331J	CHIP R 330 J 1/10W	
R11			RK73GB2A473J	CHIP R 47K J 1/10W		R240			RK73GB2A180J	CHIP R 18 J 1/10W	
R12			RK73GB2A101J	CHIP R 100 J 1/10W		R241			RK73GB2A331J	CHIP R 330 J 1/10W	
R13			RK73GB2A153J	CHIP R 15K J 1/10W		R242			RK73GB2A680J	CHIP R 68 J 1/10W	
R14			RK73GB2A394J	CHIP R 390K J 1/10W		R243			RK73GB2A183J	CHIP R 18K J 1/10W	
R15			RK73GB2A392J	CHIP R 3.9K J 1/10W		R244			RK73GB2A151J	CHIP R 150 J 1/10W	
R16			RK73GB2A000J	CHIP R 0.0 J 1/10W		R245			RK73GB2A100J	CHIP R 10 J 1/10W	
R17			RK73GB2A104J	CHIP R 100K J 1/10W		R249			RK73GB2A182J	CHIP R 1.8K J 1/10W	
R19			RK73FB2B101J	CHIP R 100 J 1/8W		R250			RK73GB2A153J	CHIP R 15K J 1/10W	
R22			RK73GB2A103J	CHIP R 10K J 1/10W		R251			RK73GB2A682J	CHIP R 6.8K J 1/10W	
R23			RK73FB2B101J	CHIP R 100 J 1/8W		R252			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R25			RK73GB2A223J	CHIP R 22K J 1/10W		R253,254			RK73GB2A472J	CHIP R 4.7K J 1/10W	
R27			RK73GB2A221J	CHIP R 220 J 1/10W		R255			RK73GB2A473J	CHIP R 47K J 1/10W	
R29			RK73GB2A103J	CHIP R 10K J 1/10W		R256			RK73GB2A222J	CHIP R 2.2K J 1/10W	
R30			RK73GB2A224J	CHIP R 220K J 1/10W		R258			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R32			RK73GB2A000J	CHIP R 0.0 J 1/10W		R264			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R41			RK73PB2H101J	CHIP R 100 J 1/2W		R266			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R44			RK73GB2A000J	CHIP R 0.0 J 1/10W		R268			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R47			RK73GB2A000J	CHIP R 0.0 J 1/10W		R274			RK73GB2A182J	CHIP R 1.8K J 1/10W	
R48			RK73GB2A103J	CHIP R 10K J 1/10W		R275			RK73GB2A122J	CHIP R 1.2K J 1/10W	
R65			RK73FB2B183J	CHIP R 18K J 1/8W		R276			RK73GB2A182J	CHIP R 1.8K J 1/10W	
R67			RK73FB2B152J	CHIP R 1.5K J 1/8W		R277			RK73GB2A122J	CHIP R 1.2K J 1/10W	
R152			RK73GB2A5R6J	CHIP R 5.6 J 1/10W		R286			RK73GB2A222J	CHIP R 2.2K J 1/10W	
R153			RK73GB2A122J	CHIP R 1.2K J 1/10W		R288			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R154			RK73GB2A331J	CHIP R 330 J 1/10W		R289-292			RK73GB2A472J	CHIP R 4.7K J 1/10W	
R156			RK73GB2A391J	CHIP R 390 J 1/10W		R294			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R157			RK73GB2A331J	CHIP R 330 J 1/10W		R295			RK73GB2A222J	CHIP R 2.2K J 1/10W	
R158			RK73FB2B331J	CHIP R 330 J 1/8W		R299			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R159			RK73GB2A120J	CHIP R 12 J 1/10W		R300			RK73GB2A470J	CHIP R 47 J 1/10W	
R160			RK73GB2A332J	CHIP R 3.3K J 1/10W		R301			RK73GB2A684J	CHIP R 680K J 1/10W	
R161			RK73GB2A331J	CHIP R 330 J 1/10W		R304-308			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R163			RK73GB2A391J	CHIP R 390 J 1/10W		R310			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R164			RK73GB2A331J	CHIP R 330 J 1/10W		R312			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R165			RK73FB2B8R2J	CHIP R 8.2 J 1/8W		R313,314			RK73GB2A220J	CHIP R 22 J 1/10W	
R166,167			RK73FB2B391J	CHIP R 390 J 1/8W		R315			RK73GB2A104J	CHIP R 100K J 1/10W	
R168			RK73FB2B120J	CHIP R 12 J 1/8W		R316			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R170			RK73FB2B331J	CHIP R 330 J 1/8W		R317			RK73GB2A273J	CHIP R 27K J 1/10W	
R171,172			RK73GB2A103J	CHIP R 10K J 1/10W		R318			RK73GB2A470J	CHIP R 47 J 1/10W	
R173			RK73GB2A153J	CHIP R 15K J 1/10W		R319			RK73GB2A681J	CHIP R 680 J 1/10W	
R174			RK73GB2A103J	CHIP R 10K J 1/10W		R320			RK73GB2A331J	CHIP R 330 J 1/10W	
R202			RK73GB2A472J	CHIP R 4.7K J 1/10W		R321			RK73GB2A274J	CHIP R 270K J 1/10W	
R203,204			RK73GB2A000J	CHIP R 0.0 J 1/10W		R323			RK73GB2A333J	CHIP R 33K J 1/10W	
R205,206			RK73GB2A472J	CHIP R 4.7K J 1/10W		R324,325			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R207			RK73GB2A000J	CHIP R 0.0 J 1/10W		R326			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R208			RK73GB2A104J	CHIP R 100K J 1/10W		R327,328			RK73GB2A332J	CHIP R 3.3K J 1/10W	
R211			RK73GB2A000J	CHIP R 0.0 J 1/10W		R329			RK73GB2A273J	CHIP R 27K J 1/10W	
R212			RK73GB2A104J	CHIP R 100K J 1/10W		R330			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R214			RK73GB2A472J	CHIP R 4.7K J 1/10W		R333			RK73GB2A224J	CHIP R 220K J 1/10W	
R216			RK73GB2A000J	CHIP R 0.0 J 1/10W		R334			RK73GB2A471J	CHIP R 470 J 1/10W	
R220			RK73GB2A000J	CHIP R 0.0 J 1/10W		R335			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R222			RK73GB2A470J	CHIP R 47 J 1/10W		R336			RK73GB2A224J	CHIP R 220K J 1/10W	
R223			RK73GB2A102J	CHIP R 1.0K J 1/10W		R337			RK73GB2A683J	CHIP R 68K J 1/10W	
R227			RK73GB2A470J	CHIP R 47 J 1/10W		R338			RK73GB2A332J	CHIP R 3.3K J 1/10W	
R228			RK73GB2A222J	CHIP R 2.2K J 1/10W		R339			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R229,230			RK73GB2A472J	CHIP R 4.7K J 1/10W		R340			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R231			RK73FB2B331J	CHIP R 330 J 1/8W		R341			RK73GB2A332J	CHIP R 3.3K J 1/10W	
R232			RK73FB2B180J	CHIP R 18 J 1/8W		R342			RK73GB2A104J	CHIP R 100K J 1/10W	

## PARTS LIST

## TX-RX UNIT (X57-7610-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R344			RK73GB2A000J	CHIP R 0.0 J 1/10W		R459			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R345			RK73GB2A473J	CHIP R 47K J 1/10W		R460			RK73GB2A123J	CHIP R 12K J 1/10W	
R347			RK73GB2A333J	CHIP R 33K J 1/10W		R461			RN73GH1J222D	CHIP R 2.2K D 1/16W	
R348			RK73GB2A270J	CHIP R 27 J 1/10W		R462			RK73GB2A224J	CHIP R 220K J 1/10W	
R349			RK73GB2A104J	CHIP R 100K J 1/10W		R463			RK73GB2A124J	CHIP R 120K J 1/10W	
R350			RK73GB2A270J	CHIP R 27 J 1/10W		R464			RN73GH1J334D	CHIP R 330K D 1/16W	
R352			RK73GB2A104J	CHIP R 100K J 1/10W		R465			RK73GB2A100J	CHIP R 10 J 1/10W	
R353,354			RK73GB2A470J	CHIP R 47 J 1/10W		R466,467			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R356			RK73GB2A104J	CHIP R 100K J 1/10W		R468,469			RK73GB2A104J	CHIP R 100K J 1/10W	
R357			RK73GB2A333J	CHIP R 33K J 1/10W		R470			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R358			RK73GB2A474J	CHIP R 470K J 1/10W		R471			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R363			RK73FB2B000J	CHIP R 0.0 J 1/8W		R472			RK73GB2A106J	CHIP R 10M J 1/10W	
R364,365			RK73GB2A472J	CHIP R 4.7K J 1/10W		R473			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R374			RK73GB2A154J	CHIP R 150K J 1/10W		R474			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R375			RK73GB2A122J	CHIP R 1.2K J 1/10W		R475			RK73GB2A473J	CHIP R 47K J 1/10W	
R376			RK73GB2A154J	CHIP R 150K J 1/10W		R476,477			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R400			RK73GB2A000J	CHIP R 0.0 J 1/10W		R478			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R401			RK73GB2A104J	CHIP R 100K J 1/10W		R479			RN73GH1J391D	CHIP R 390 D 1/16W	
R402			RK73GB2A102J	CHIP R 1.0K J 1/10W		R480			RK73GB2A274J	CHIP R 270K J 1/10W	
R403			RK73GB2A563J	CHIP R 56K J 1/10W		R481,482			RN73GH1J391D	CHIP R 390 D 1/16W	
R404			RK73GB2A101J	CHIP R 100 J 1/10W		R483			RK73GB2A152J	CHIP R 1.5K J 1/10W	
R405			RK73GB2A103J	CHIP R 10K J 1/10W		R484			RK73GB2A100J	CHIP R 10 J 1/10W	
R406			RK73GB2A104J	CHIP R 100K J 1/10W		R485			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R407-410			RK73GB2A101J	CHIP R 100 J 1/10W		R486			RN73GH1J271D	CHIP R 270 D 1/16W	
R411			RK73GB2A000J	CHIP R 0.0 J 1/10W		R487			RN73GH1J101D	CHIP R 100 D 1/16W	
R412-414			RK73GB2A101J	CHIP R 100 J 1/10W		R488			RK73GB2A104J	CHIP R 100K J 1/10W	
R415,416			RK73GB2A000J	CHIP R 0.0 J 1/10W		R489			RN73GH1J221D	CHIP R 220 D 1/16W	
R417			RK73GB2A103J	CHIP R 10K J 1/10W		R490			RN73GH1J101D	CHIP R 100 D 1/16W	
R418			RK73GB2A223J	CHIP R 22K J 1/10W		R491			RK73GB2A224J	CHIP R 220K J 1/10W	
R419			RK73GB2A183J	CHIP R 18K J 1/10W		R493			RN73GH1J221D	CHIP R 220 D 1/16W	
R420			RK73GB2A271J	CHIP R 270 J 1/10W		R494			RN73GH1J101D	CHIP R 100 D 1/16W	
R422			RK73GB2A392J	CHIP R 3.9K J 1/10W		R496			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R423			RK73GB2A183J	CHIP R 18K J 1/10W		R498			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R424			RK73GB2A330J	CHIP R 33 J 1/10W		R499			RK73GB2A273J	CHIP R 27K J 1/10W	
R426			RK73FB2B000J	CHIP R 0.0 J 1/8W		R502			RK73GB2A330J	CHIP R 33 J 1/10W	
R427			RK73GB2A470J	CHIP R 47 J 1/10W		R510			RK73GB2A472J	CHIP R 4.7K J 1/10W	
R428			RK73GB2A102J	CHIP R 1.0K J 1/10W		R513,514			RK73GB2A472J	CHIP R 4.7K J 1/10W	
R429			RN73GH1J470D	CHIP R 47 D 1/16W		R518,519			RK73GB2A472J	CHIP R 4.7K J 1/10W	
R430			RN73GH1J681D	CHIP R 680 D 1/16W		R520			RK73GB2A330J	CHIP R 33 J 1/10W	
R431			RK73GB2A102J	CHIP R 1.0K J 1/10W		R521,522			RK73GB2A101J	CHIP R 100 J 1/10W	
R432			RK73GB2A561J	CHIP R 560 J 1/10W		R523,524			RK73GB2A103J	CHIP R 10K J 1/10W	
R433			RK73GB2A222J	CHIP R 2.2K J 1/10W		R525			RK73GB2A330J	CHIP R 33 J 1/10W	
R434			RN73GH1J331D	CHIP R 330 D 1/16W		R527			RK73GB2A101J	CHIP R 100 J 1/10W	
R436-438			RK73GB2A000J	CHIP R 0.0 J 1/10W		R528			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R439			RK73GB2A103J	CHIP R 10K J 1/10W		R529,530			RK73GB2A104J	CHIP R 100K J 1/10W	
R440			RK73GB2A151J	CHIP R 150 J 1/10W		R531,532			RK73GB2A273J	CHIP R 27K J 1/10W	
R441			RK73GB2A561J	CHIP R 560 J 1/10W		R533,534			RK73GB2A274J	CHIP R 270K J 1/10W	
R442			RK73GB2A000J	CHIP R 0.0 J 1/10W		R535			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R444			RK73GB2A822J	CHIP R 8.2K J 1/10W		R600			RK73GB2A473J	CHIP R 47K J 1/10W	
R445-447			RK73GB2A101J	CHIP R 100 J 1/10W		R601			RK73GB2A222J	CHIP R 2.2K J 1/10W	
R448			RK73GB2A154J	CHIP R 150K J 1/10W		R602			RK73GB2A473J	CHIP R 47K J 1/10W	
R450			RK73GB2A330J	CHIP R 33 J 1/10W		R603			RK73GB2A472J	CHIP R 4.7K J 1/10W	
R451			RK73GB2A473J	CHIP R 47K J 1/10W		R604,605			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R452			RK73GB2A102J	CHIP R 1.0K J 1/10W		R606			RK73GB2A273J	CHIP R 27K J 1/10W	
R453			RK73GB2A100J	CHIP R 10 J 1/10W		R607			RK73GB2A683J	CHIP R 68K J 1/10W	
R454			RK73GB2A000J	CHIP R 0.0 J 1/10W		R608			RK73GB2A224J	CHIP R 220K J 1/10W	
R455			RK73GB2A104J	CHIP R 100K J 1/10W		R609			RK73GB2A104J	CHIP R 100K J 1/10W	
R456			RK73GB2A102J	CHIP R 1.0K J 1/10W		R610			RN73GH1J183D	CHIP R 18K D 1/16W	
R457			RK73GB2A104J	CHIP R 100K J 1/10W		R611			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R458			RN73GH1J104D	CHIP R 100K D 1/16W		R612			RK73GB2A474J	CHIP R 470K J 1/10W	



## PARTS LIST

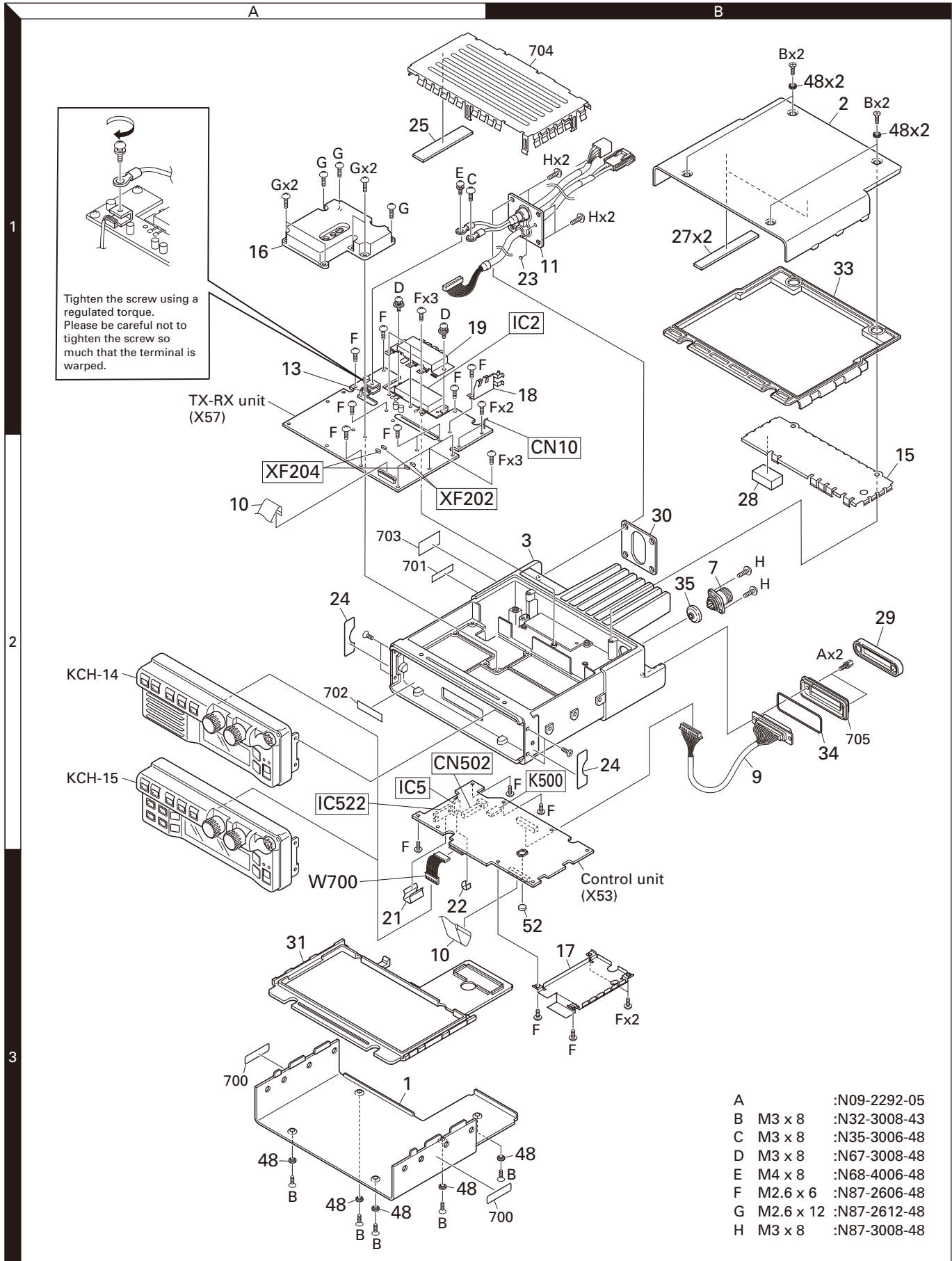
TX-RX UNIT (X57-7610-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R613,614			RK73GB2A821J	CHIP R 820 J 1/10W		Q207			2SC5108(Y)F	TRANSISTOR	
R619			RK73FB2B331J	CHIP R 330 J 1/8W		Q208			RT1N141U-T111	TRANSISTOR	
R620			RK73GB2A474J	CHIP R 470K J 1/10W		Q209			RT1P441U-T111	TRANSISTOR	
R622			RK73GB2A000J	CHIP R 0.0 J 1/10W		Q210			SSM3K15TE(F)	FET	
VR1			R12-6431-05	TRIMMING POT (220K)		Q211			2SC4617(S)	TRANSISTOR	
D1			MA4PH633	DIODE		Q213,214			3SK293-F	FET	
D2			UDZW5.6(B)	ZENER DIODE		Q400			2SK879-F(Y)	FET	
D3			L7091CER	DIODE		Q403			2SC5108(Y)F	TRANSISTOR	
D5,6			HSM88AS-E	DIODE		Q404			RN47A4-F	TRANSISTOR	
D10			MA2S111-F	DIODE		Q405			2SJ347F	FET	
D11			L7091CER	DIODE		Q406			SSM5H01TU-F	FET	
D12			MA4PH633	DIODE		Q407			RN47A4-F	TRANSISTOR	
D13			ZSH5MA27	SURGE ABSORBER		Q408			2SJ347F	FET	
D14			DF25V60	DIODE		Q409,410			RN47A4-F	TRANSISTOR	
D15,16			RN142S	DIODE		Q411,412			2SC4116(GR)F	TRANSISTOR	
D17			CSA70-401L	SURGE ABSORBER		Q413-415			2SK508NV(52K)	FET	
D204-215			RN142S	DIODE		Q416			2SC5108(Y)F	TRANSISTOR	
D216			RB706F-40	DIODE		Q419,420			2SC5108(Y)F	TRANSISTOR	
D217			1SS388F	DIODE		Q600			RT1N141U-T111	TRANSISTOR	
D400			MA2S111-F	DIODE		Q601			2SB1132(Q,R)	TRANSISTOR	
D401			DA221	DIODE		Q602			RT1N141U-T111	TRANSISTOR	
D402			1SV305F	VARIABLE CAPACITANCE DIODE		Q603			2SB1132(Q,R)	TRANSISTOR	
D403			HVC376B	VARIABLE CAPACITANCE DIODE		Q605,606			2SJ347F	FET	
D405-407			1SV282-F	VARIABLE CAPACITANCE DIODE		Q607			2SK1830F	FET	
D408			1SV305F	VARIABLE CAPACITANCE DIODE		TH4,5			S1R103J440H	THERMISTOR	
D409			HVC376B	VARIABLE CAPACITANCE DIODE							
D411,412			1SV282-F	VARIABLE CAPACITANCE DIODE							
D413			1SV305F	VARIABLE CAPACITANCE DIODE							
D414			HVC376B	VARIABLE CAPACITANCE DIODE							
D416,417			1SV282-F	VARIABLE CAPACITANCE DIODE							
D418			1SV278F	VARIABLE CAPACITANCE DIODE							
D419,420			RN142S	DIODE							
D421,422			1SV282-F	VARIABLE CAPACITANCE DIODE							
D423,424			1SV278F	VARIABLE CAPACITANCE DIODE							
IC1			TA75W01FUF	MOS-IC							
<b>IC2</b>	1A	*	RA45H76871101	MOS-IC							
IC201			TC7W53FK(F)	MOS-IC							
IC203			TC7W53FK(F)	MOS-IC							
IC205			TC7W53FK(F)	MOS-IC							
IC207			TC7W53FK(F)	MOS-IC							
IC209			TA31137FNG	MOS-IC							
IC210			TC7WU04FK-F	MOS-IC							
IC211			TC7S66FUF	MOS-IC							
IC212		*	CMY210	MOS-IC							
IC213			XC6204B332M	MOS-IC							
IC400			LMX2352TMX/NP	ANALOGUE IC							
IC401			MCP41100T	ANALOGUE IC							
IC402			XC9101D09AKR	ANALOGUE IC							
IC403,404			LMC7101BIM5	MOS-IC							
IC600			BU4094BCFV	MOS-IC							
IC601			TA7805FQ	MOS-IC							
IC602			TC7W53FK(F)	MOS-IC							
IC603			TC7S51FE(F)	MOS-IC							
Q150			2SK3077F	FET							
Q151			RD01MUS1-T113	FET							
Q201			RT1N141U-T111	TRANSISTOR							
Q202			RT1P141U-T111	TRANSISTOR							
Q203,204			2SC3357-A(RF)	TRANSISTOR							
Q205			2SC4215-F(Y)	TRANSISTOR							

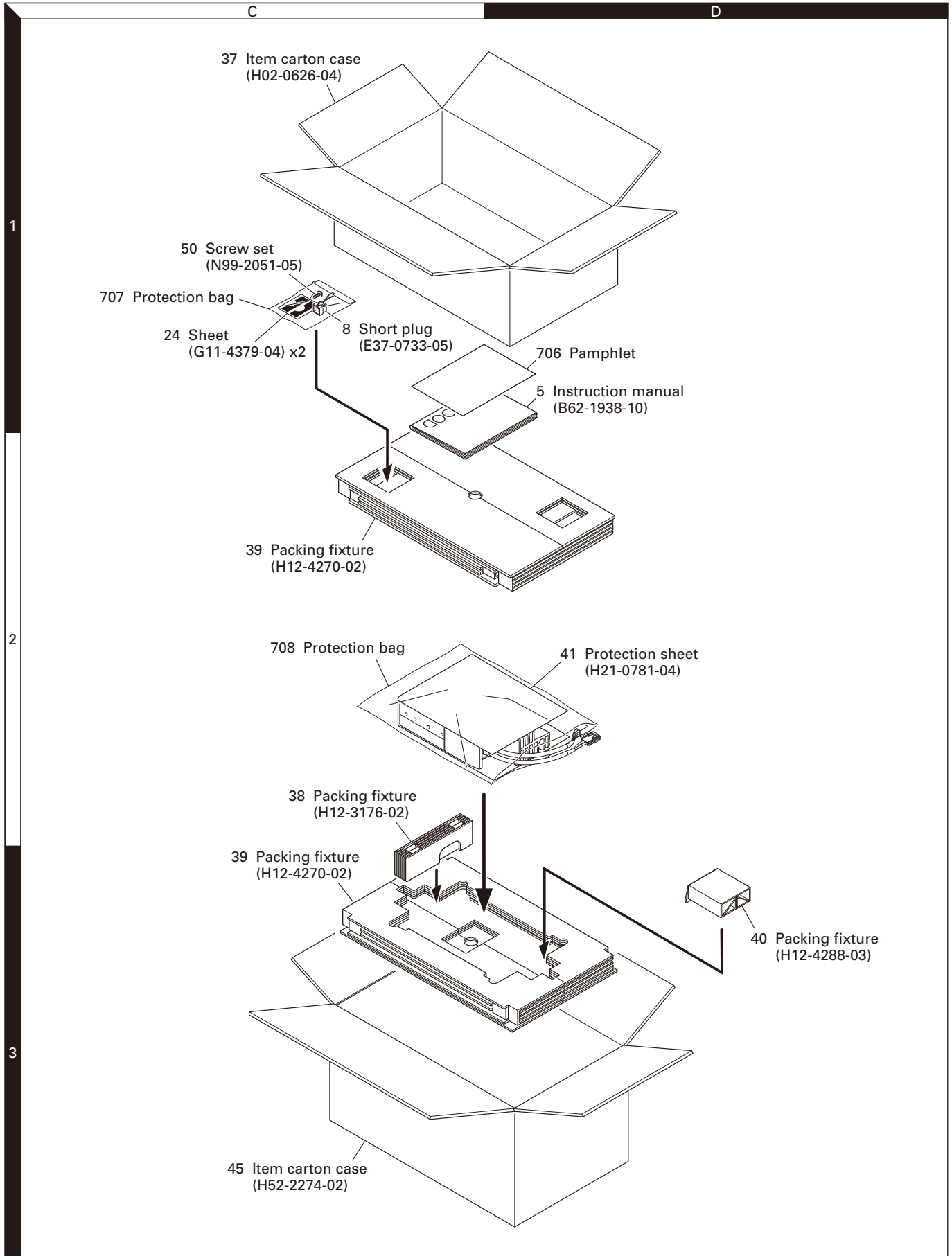
If a part reference number is listed in a shaded box, that part does not come with the PCB.

# TK-5910(B)

## EXPLODED VIEW



## PACKING



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

## TROUBLE SHOOTING

### Fault diagnosis of the BGA (Ball Grid Array) IC

#### ■ Overview

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

#### ■ BGA parts

ASIC (IC708), DSP (IC701), FLASH (IC700), SRAM (IC703)

#### ● Checking power supply voltage

Checking voltage	
Points to be checked	Normal voltage
33M IC2 (5 pin)	3.3V
15M IC8 (5 pin)	1.5V
33A IC7 (5 pin)	3.3V
33BU Q7 (Collector)	3.3V

Power supply of each device is connected through the ferrite bead.  
 [ASIC]  
 33M: L708, 15M: L709  
 [DSP]  
 33M: L702, 15M: L701  
 [FLASH]  
 33M: L700  
 [SRAM]  
 33BU: L703

When an abnormal value is confirmed.

Checking for an abnormal point

33M has an abnormal voltage.  
 [ASIC]  
 Remove L708 to check the voltage of the 33M. If the voltage becomes normal, the ASIC is broken.  
 [DSP]  
 Remove L702 to check the voltage of the 33M. If the voltage becomes normal, the DSP is broken.

[FLASH]  
 Remove L700 to check the voltage of the 33M. If the voltage becomes normal, the FLASH is broken.

15M has an abnormal voltage.  
 [ASIC]  
 Remove L709 to check the voltage of the 15M. If the voltage becomes normal, the ASIC is broken.  
 [DSP]  
 Remove L701 to check the voltage of the 15M. If the voltage becomes normal, the DSP is broken.

#### ● Checking the clock

Checking the clock	
Points to be checked	Normal voltage (3.3V)
18.432MHz ASIC side R764	18.432MHz
DSP side R713	18.432MHz
32.768kHz IC704 (1 pin)	32.768kHz

When a normal value is confirmed.

When an abnormal value is confirmed.

33A has an abnormal voltage.  
 [ASIC]  
 Exchange IC7 (33A Regulator) to check the voltage of the 33A. If the voltage becomes normal, the ASIC is broken.

#### ● Checking the Reset/Control signal

Checking the control signal input to the ASIC	
Points to be checked	Normal voltage
RESET IC705 (4 pin)	3.3V
/BINT IC1 (1 pin)	3.3V
/OVRB D3 (Cathode side)	3.3V

When a normal value is confirmed.

When an abnormal value is confirmed.

33BU has an abnormal voltage.  
 [SRAM]  
 Remove L703 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 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 Q201 (Drain) The ignition key is kept ON.	0V
/IGN (R825)	0V

When a normal value is confirmed.

When an abnormal value is confirmed.

Remove the R764 and R713. If it oscillates normally, the DSP and ASIC may be broken.  
 Exchange IC704 (RTC). If it oscillates normally, the ASIC may be broken.

The BGA parts are not broken.

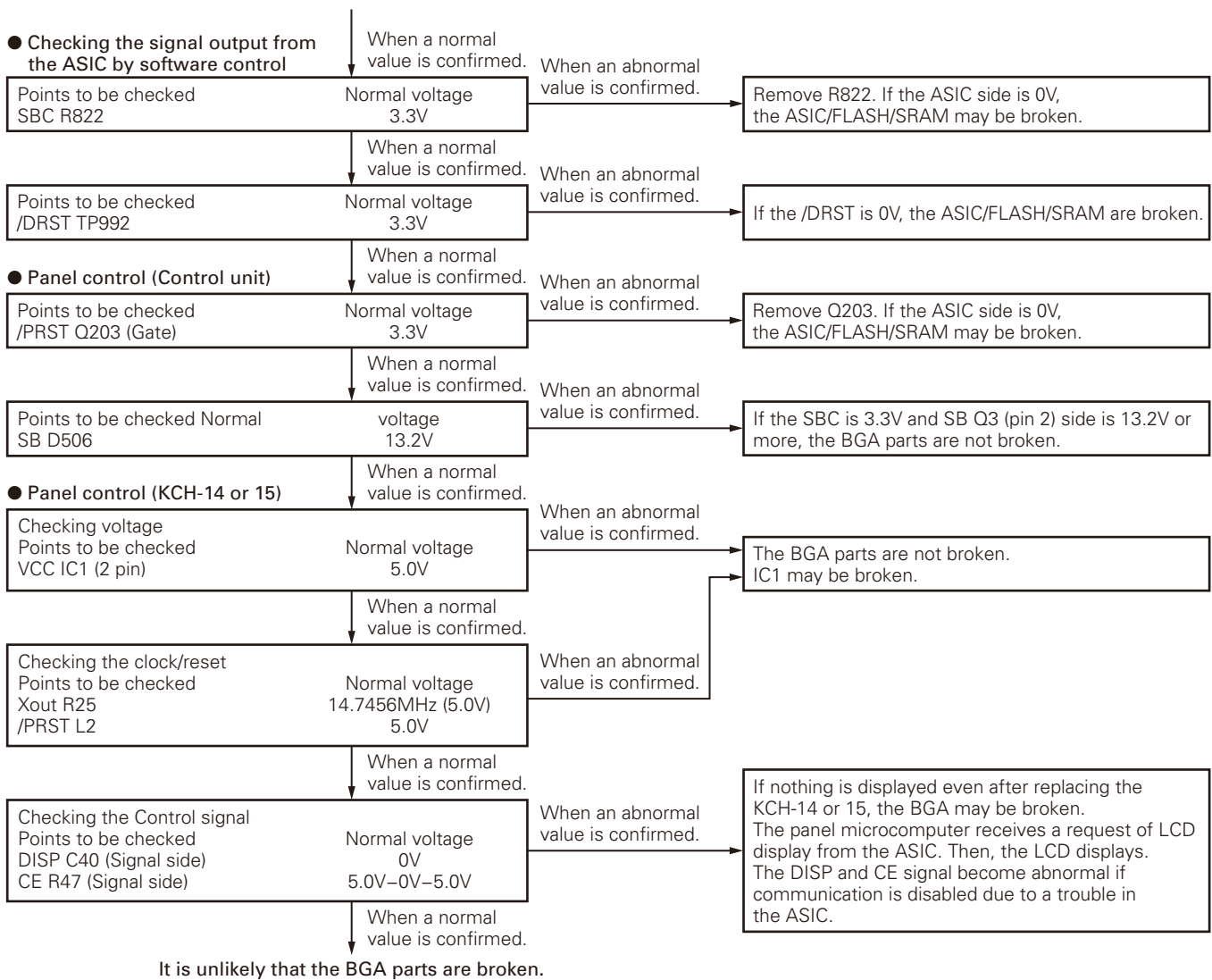
Points to be checked	Normal voltage
/FRST TP991	3.3V

When a normal value is confirmed.

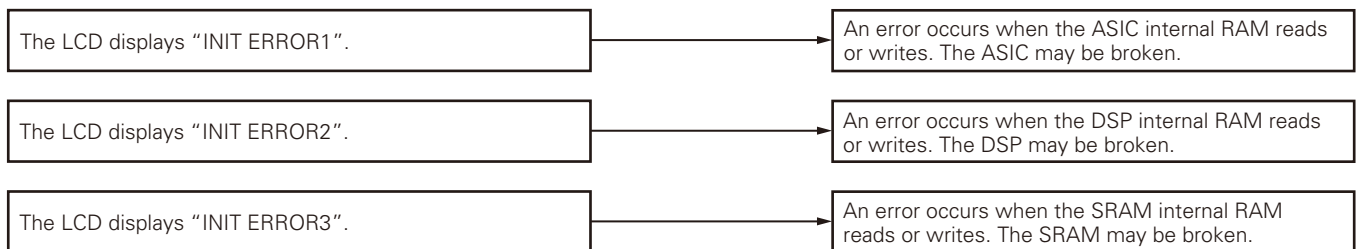
When an abnormal value is confirmed.

If the /FRST is always 0V, the ASIC is broken.  
 If the /FRST repeats 3.3V and 0V at intervals, the ASIC, FLASH and SRAM may be broken.

## TROUBLE SHOOTING



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



### Replacing Control Unit

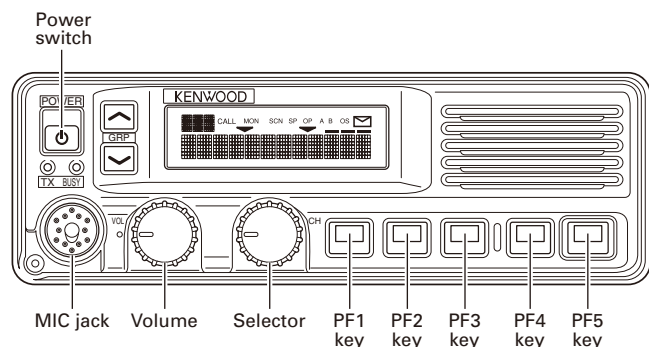
#### ■ Control unit Information

Model Name	Original Control unit Number	For Service Control unit Number
TK-5910(B) K	X53-4400-10	X53-4400-11

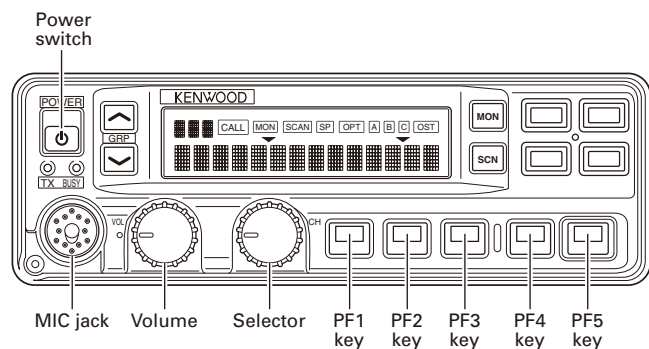
## ADJUSTMENT

### Controls

#### • KCH-14 (Basic control panel)



#### • KCH-15 (Full-featured control panel)



### Panel Test Mode

#### ■ Test mode operation features

This transceiver has a test mode. To enter test mode, press and hold the [PF1] key while turning the transceiver power ON. Test mode can be inhibited by programming. To exit test mode, turn the transceiver power OFF.

- When the panel test mode is activated, the last used channel and signaling numbers are displayed. When the panel test mode is activated for the first time, the channel and signaling numbers are 1.
- If test signaling 26 (Tone Pattern) is selected, the result of Bit Error Rate (BER) calculation is displayed on the LCD. The BER value is also output from the serial port.

### ■ Key operation

Key	"FNC" not appears	
	Function	Display
[Selector]	Wide/NPSPSC/Narrow/P25	Wide: "W" appears NPSPAC: "S" appears Narrow: "N" appears P25: "A" appears
[GRP ^]	Shifts to the Panel tuning mode	–
[GRP v]	High Power/Medium Power/Low Power	Medium: "SP" icon appears Low: "CALL" icon appears
[GRP v] Hold	Squelch off	"MON" icon appears
[PF1]	Test frequency channel down	Channel No.
[PF1] Hold	Test frequency channel continuation down	Channel No.
[PF2]	Test frequency channel up	Channel No.
[PF2] Hold	Test frequency channel continuation up	Channel No.
[PF3]	Test signaling down	Signaling No.
[PF3] Hold	Test signaling continuation down	Signaling No.
[PF4]	Test signaling up	Signaling No.
[PF4] Hold	Test signaling continuation up	Signaling No.
[PF5]	Function on	"FNC" appears
MIC PTT	Transmit	–
MIC keypad ([0] to [9] and [#], [*])	Use as the DTMF keypad. If a key is pressed during transmission, the DTMF corresponding to the key that was pressed is sent.	–

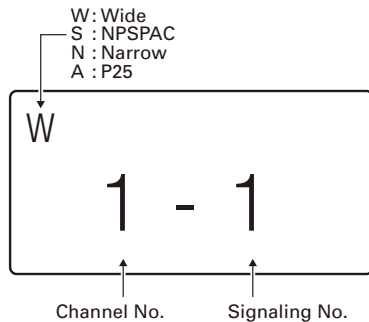
Key	"FNC" appears	
	Function	Display
[Selector]	Function off	–
[GRP ^]	Squelch level 0	On: "▼" icon appears
[GRP v]	AFC on/off	On: "OP" icon appears The "OP" icon is displayed only when Test Signaling has been set to 17~19 or 21~26
[PF1]	Companer on/off	On: "A" icon appears
[PF2]	LCD all lights	LCD all point appears
[PF3]	Tolk around on/off	On: "B" icon appears
[PF4]	Beat shift on/off	On: "OS" icon appears (KCH-14) On: "OST" icon appears (KCH-15)
[PF5]	Function off	–
MIC PTT	Transmit	–
MIC keypad ([0] to [9] and [#], [*])	Function off	–

## ADJUSTMENT

### • LED indicator

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

### • LCD display in the panel test mode



### • Filter Mode

Display	Condition
W	WIDE (25kHz) Filter
S	NPSPAC (25kHz) Filter
N	NARROW (12.5kHz) Filter
A	P25 (12.5kHz) Filter

### ■ Frequency and Signaling

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

### • Test Frequency

CH	RX	TX
1	763.05000	793.05000
2	769.05000	799.05000
3	775.95000	805.95000
4	763.55000	793.55000
5	769.55000	799.55000
6	775.45000	805.45000
7	851.05000	806.05000
8	860.05000	815.05000
9	869.95000	824.95000
10	851.55000	806.55000
11	860.55000	815.55000
12	869.45000	824.45000
13~16	-	-

### • Test Signaling

Signaling No.	RX	TX	P25/ Analog
1	None	None	Analog
2	None	100Hz Square Wave	Analog
3	QT 67.0Hz	QT 67.0Hz	Analog
4	QT 151.4Hz	QT 151.4Hz	Analog
5	QT 210.7Hz	QT 210.7Hz	Analog
6	QT 254.1Hz	QT 254.1Hz	Analog
7	DQT 023N	DQT 023N	Analog
8	DQT 754I	DQT 754I	Analog
9	None	DTMF Encode (CODE: 159D)	Analog
10	None	DTMF Encode (CODE: 9)	Analog
11	None	None	Analog
12	None	None	Analog
13	None	None	Analog
14	None	None	Analog
15	None	None	Analog
16	Codec Loop	None	Analog
17	NAC 293	NAC 293	P25
18	NAC 023	NAC 023	P25
19	NAC 5EA	NAC 5EA	P25
20	None	PN9	P25
21	NAC 293	Symbol Rate Pattern	P25
22	NAC 293	1/3 Deviation Pattern	P25
23	NAC 293	0 Continuous Pattern	P25
24	NAC 293	Fidelity Pattern	P25
25	None	FSW + PN9	P25
26	NAC293	NAC293 + 1011Hz Tone Pattern	P25
27	Tone Patern	NAC293 + 1011Hz Tone Pattern	P25
28	Silence Pattern (1011Hz Full Rate)	NAC293 + Silence Pattern	P25
29	Audio Test Patern (Full Rate)	NAC293 + Audio Test Patern (Full Rate)	P25
30	Vocoder Loop (Full Rate)	None	P25

### Panel Tuning Mode

The transceiver is adjusted in this mode.

### ■ Preparations for tuning the transceiver

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

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

## ADJUSTMENT

The speaker output connector must be terminated with a 4Ω dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during tuning.

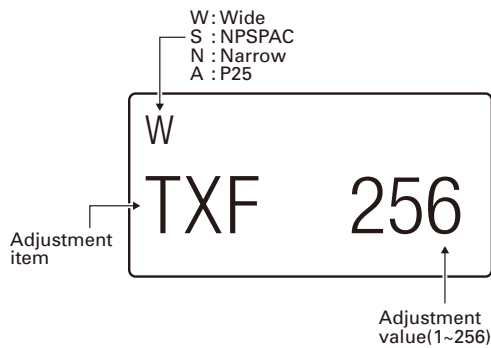
### ■ Transceiver tuning (To enter tuning mode)

To enter tuning mode, press the [GRP ^] key while the transceiver is in test mode.

Use the [PF5] key to write tuning data through tuning modes, and the [PF3] and [PF4] keys to adjust tuning requirements (1 to 256 appears on the LCD).

Use the [PF2] key to select the adjustment item through tuning modes. Use the [GRP v] key to exit 4, 6, 7, 8 or 12 reference level adjustments.

### • LCD display in the panel tuning mode



### ■ Key operation

Key	Function
[Selector]	Unused
[GRP ^]	Exit the panel tuning mode and shift to the panel test mode.
[GRP v]	Exit the 4, 6, 7, 8 or 12 reference level adjustments without backup.
[PF1]	Back to the last adjustment item (The current adjustment data is cleared.)
[PF2]	Go to the next adjustment item (The current adjustment data is cleared.)
[PF3]	Adjustment value down
[PF3] Hold	Adjustment value continuation down
[PF4]	Adjustment value up
[PF4] Hold	Adjustment value continuation up
[PF5]	Enter the 4, 6, 7, 8 or 12 reference level adjustments.
MIC PTT	Transmit

### ■ 4,6,7,8,11 or 12 reference level adjustments frequency

#### • 4,6,7,8 or 12 reference level adjustments frequency (Adjustment items other than assist voltage)

Tuning point	Display	RX (MHz)	TX (MHz)
700MHz RX/TA Low	7RL	763.10000	763.00000
700MHz RX/TA Center	7RC	769.10000	769.00000
700MHz RX/TA High	7RH	775.90000	776.00000
700MHz TX Low	7TL	763.10000	793.00000
700MHz TX Center	7TC	769.10000	799.00000
700MHz TX High	7TH	775.90000	805.99375
800MHz TX Low	8TL	851.10000	806.00000
800MHz TX Center	8TC	859.90000	815.00000
800MHz TX High	8TH	869.90000	825.00000
800MHz RX/TA Low	8RL	851.10000	851.00000
800MHz RX/TA Center	8RC	859.90000	860.00000
800MHz RX/TA High	8RH	869.90000	870.00000

#### • 6 or 11 reference level adjustments frequency (Assist voltage adjustments)

##### Transmit Assist Voltage

Tuning point	Display	RX (MHz)	TX (MHz)
700MHz RX/TA Low	7RL	763.10000	763.00000
700MHz RX/TA Center	7RC	769.10000	769.00000
700MHz RX/TA High	7RH	775.90000	776.00000
700MHz TX Low	7TL	763.10000	793.00000
700MHz TX Center	7TC	769.10000	799.00000
800MHz TX Low	8TL	851.10000	806.00000
800MHz TX Center	8TC	859.90000	815.00000
800MHz TX High	8TH	869.90000	825.00000
800MHz RX/TA Low	8RL	851.10000	851.00000
800MHz RX/TA Center	8RC	859.90000	860.00000
800MHz RX/TA High	8RH	869.90000	870.00000

##### Receive Assist Voltage

Tuning point	Display	RX (MHz)	TX (MHz)
700MHz RX/TA Low	7RL	763.10000	763.00000
700MHz RX/TA Center	7RC	769.10000	769.00000
700MHz RX/TA High	7RH	775.90000	776.00000
800MHz RX/TA Low	8RL	851.10000	851.00000
800MHz RX/TA Center	8RC	859.90000	860.00000
800MHz RX/TA High	8RH	869.90000	870.00000



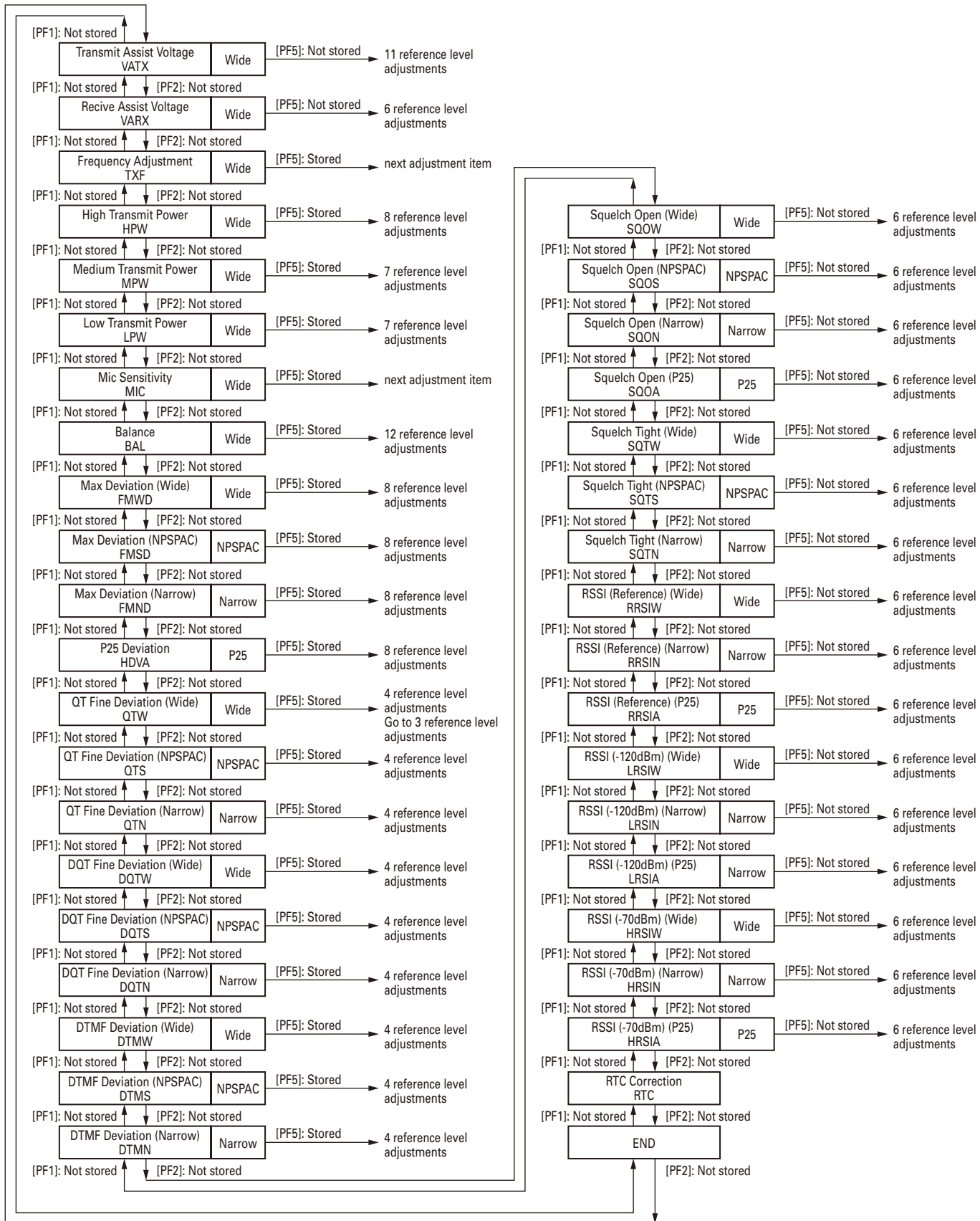
## ADJUSTMENT

## ■ Adjustment item and Display (\*\*\*: 1~256)

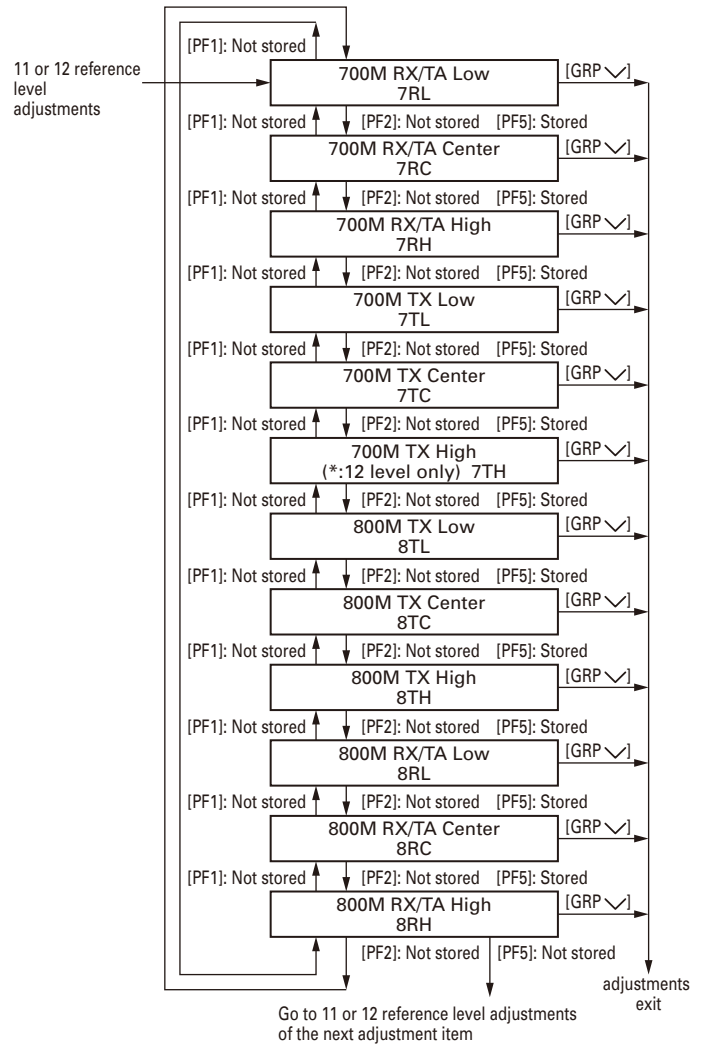
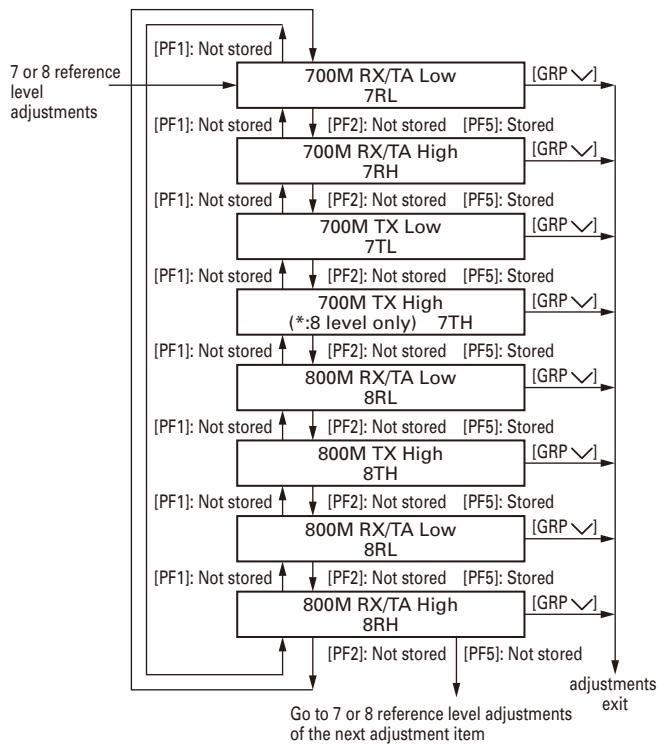
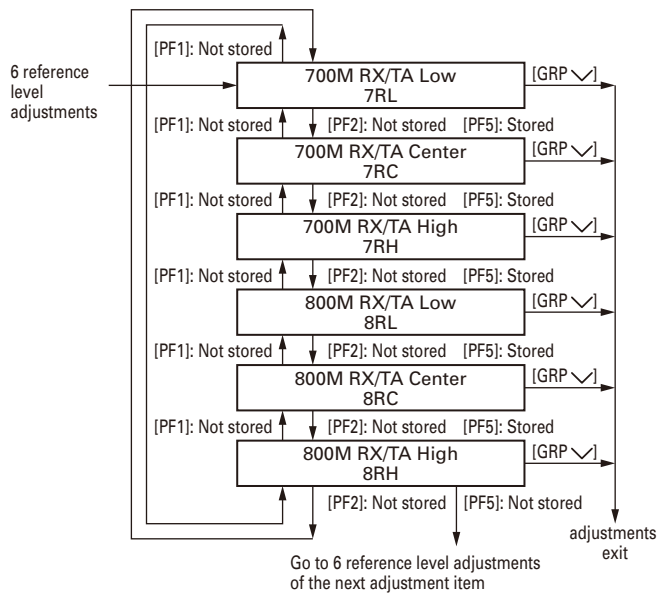
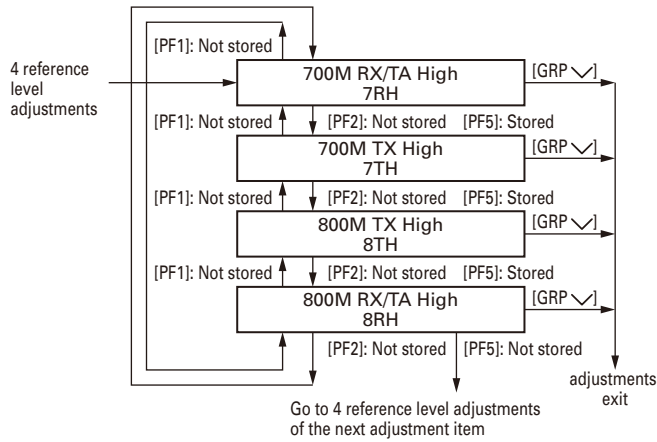
No.	Adjustment item	Display	Wide/NPSPAC/ Narrow/P25	Tuning Point	Note
1	Transmit Assist Voltage	VATX ***	Wide	11	
2	Recive Assist Voltage (Upper)	VARX ***	Wide	6	
3	Frequency Adjustment	TXF ***	Wide	1	
4	High Transmit Power	HPW ***	Wide	8	
5	Medium Transmit Power	MPW ***	Wide	7	
6	Low Transmit Power	LPW ***	Wide	7	
7	Mic Sensitivity	MIC ***	Wide	1	
8	Balance	BAL ***	Wide	12	100Hz Square Wave
9	Max Deviation (Wide)	FMWD ***	Wide	8	
10	Max Deviation (NPSPAC)	FMSD ***	NPSPAC	8	
11	Max Deviation (Narrow)	FMND ***	Narrow	8	
12	P25 High Deviation	HDVA ***	P25	8	Symbol Rate Pattern
13	QT Fine Deviation (Wide)	QTW ***	Wide	4	QT: 67Hz
14	QT Fine Deviation (NPSPAC)	QTS ***	NPSPAC	4	QT: 67Hz
15	QT Fine Deviation (Narrow)	QTN ***	Narrow	4	QT: 67Hz
16	DQT Fine Deviation (Wide)	DQTW ***	Wide	4	DQT: 023N
17	DQT Fine Deviation (NPSPAC)	DQTS ***	NPSPAC	4	DQT: 023N
18	DQT Fine Deviation (Narrow)	DQTN ***	Narrow	4	DQT: 023N
19	DTMF Deviation (Wide)	DTMW ***	Wide	4	DTMF Code: 9
20	DTMF Deviation (NPSPAC)	DTMS ***	NPSPAC	4	DTMF Code: 9
21	DTMF deviation (Narrow)	DTMN ***	Narrow	4	DTMF Code: 9
22	Squelch Open (Wide)	SQOW ***	Wide	6	AF unmute
23	Squelch Open (NPSPAC)	SQOS ***	NPSPAC	6	AF unmute
24	Squelch Open (Narrow)	SQON ***	Narrow	6	AF unmute
25	Squelch Open (P25)	SQOA ***	P25	6	
26	Squelch Tight (Wide)	SQTW ***	Wide	6	AF unmute
27	Squelch Tight (NPSPAC)	SQTS ***	NPSPAC	6	AF unmute
28	Squelch Tight (Narrow)	SQTN ***	Narrow	6	AF unmute
29	RSSI (Reference) (Wide)	RRSIW ***	Wide	6	
30	RSSI (Reference) (Narrow)	RRSIN ***	Narrow	6	
31	RSSI (Reference) (P25)	RRSIA ***	P25	6	
32	RSSI (-120dBm) (Wide)	LRSIW ***	Wide	6	
33	RSSI (-120dBm) (Narrow)	LRSIN ***	Narrow	6	
34	RSSI (-120dBm) (P25)	LRSIA ***	P25	6	
35	RSSI (-70dBm) (Wide)	HRSIW ***	Wide	6	
36	RSSI (-70dBm) (Narrow)	HRSIN ***	Narrow	6	
37	RSSI (-70dBm) (P25)	HRSIA ***	P25	6	
38	RTC Correction	RTC ***	-		-62~+62
39	END	-	-		

## ADJUSTMENT

### Flow Chart



## ADJUSTMENT



## ADJUSTMENT

### BER (Bit Error Rate) Measurement

1. The Panel Test Mode is used to measure the BER (Refer to "Test mode operation features" described on page 46.).
2. Select "26" for test signaling (Refer to "Test Signaling" described on page 47.).  
When "26" is selected for the test signaling, the filter is automatically selected to "P25".  
(If there is no RF input signal, the display shows "500000")
3. Select a filter (Refer to "Filter Mode" described on page 47.).
4. Select a test frequency (Refer to "Test Frequency" described on page 47.).



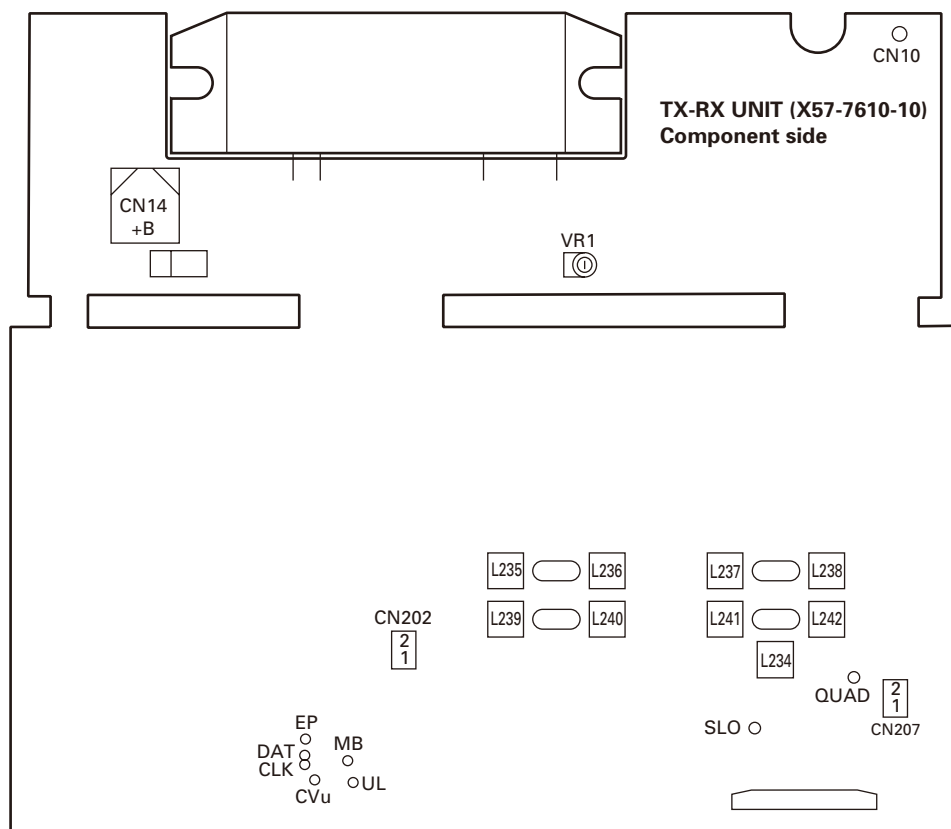
5. Measure the BER (Bit Error Rate) using the digital radio tester. Enter a standard input signal into the transceiver as a standard tone test pattern.
6. Adjust the input signal level to achieve the standard bit error rate (BER).  
(For example, if the BER is 5%, the display shows "050000".)



### C4FM (P25) Deviation Adjustment

1. The transceiver adjusts the deviation between High Deviation  $\pm 1800\text{Hz}$  for the C4FM (P25).
2. The Symbol Rate Pattern is used when adjusting the High Deviation for the C4FM (P25) (Refer to "Test Signaling" described on page 47.). This test signal has a peak deviation equal to  $\pi/2$   $1800\text{Hz} = 2827\text{Hz}$ .

### Adjustment Points



## ADJUSTMENT

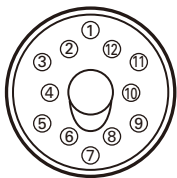
### Test Equipment Required for Alignment

Test Equipment		Major Specifications	
1.	Standard Signal Generator (SSG)	Frequency Range Modulation Output	700 to 950MHz Frequency modulation and external modulation -127dBm/0.1μV to greater than -47dBm/1mV
2.	Power Meter	Input Impedance Operation Frequency Measurement Range	50Ω 700 to 950MHz or more Vicinity of 200W
3.	Deviation Meter	Frequency Range	700 to 950MHz
4.	Digital Volt Meter (DVM)	Measuring Range Input Impedance	1 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 1000MHz 0.2ppm or less
7.	Ammeter		30A
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 or more 0 to 1V
10.	Distortion Meter	Capability Input Level	3% or less at 1kHz 50mV to 10Vrms
11.	Spectrum Analyzer	Measuring Range	DC to 1GHz or more
12.	Tracking Generator	Center frequency Output Voltage	50kHz to 600MHz 100mV or more
13.	4Ω Dummy Load		Approx. 4Ω, 30W
14.	Regulated Power Supply		13.6V, approx. 30A (adjusted from 9 to 20V) Useful if ammeter equipped

### Caution

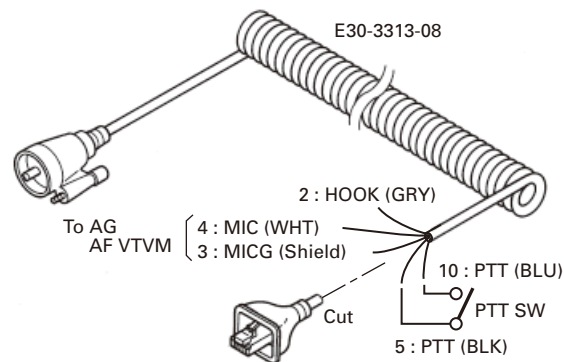
Since the RX AF output is a BTL output, there is a DC Component. Isolate this with a capacitor or transformer as shown in the figure.

### MIC connector (Front view)



- 1: SB
- 2: HK
- 3: ME
- 4: MIC
- 5: E
- 6: TRD
- 7: KVL
- 8: DM
- 9: BLC
- 10: PTT
- 11: NC
- 12: ES2

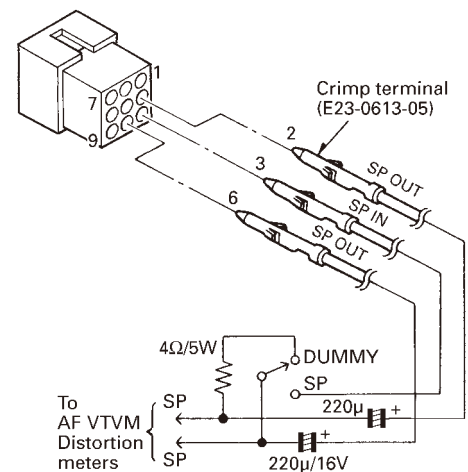
### Test cable for microphone input



### Cable for BPF or MCF adjustment

- E30-3418-05 (for BPF ADJ)
- W05-1000-00 (for MCF ADJ)

### Test cable for speaker output



## ADJUSTMENT

## Common Section

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) BATT terminal voltage: 13.6V 2) SSG standard modulation [Wide] MOD: 1kHz, DEV: 3kHz [NPSPEC] MOD: 1kHz, DEV: 2.4kHz [Narrow] MOD: 1kHz, DEV: 1.5kHz								
2. Transmit Assist voltage	1) Adj item: [VATX] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [7TL]→[7TC]→ [8TL]→[8TC]→ [8TH]→[8RL]→ [8RC]→[8RH] Adjust: [***] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [Transmit Assist Voltage] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High]→ [TX Low]→ [TX Center] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High]→ [TX Low]→ [TX Center]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.	Power meter  DVM	Rear Panel  TX-RX	ANT  Test point CVu		[Panel tuning mode] [PF3] [PF4]  [PC test mode] [◀ ▶]	[PC test mode] • Automatic Adjustment 1) Press [*Tune Assist Voltage (Auto)] button. 2) [Assist Voltage Result] window shows result of assist voltage after the automatic adjustment was finished. This mode adjust [TX], [RX] Assist voltage at once.  • Manual Adjustment 1) Press [Meter] button. 2) The display on the [VCO Lock Voltage] 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.	2.0V±0.1V
Receive Assist Voltage	1) Adj item: [VARX] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] Adjust: [***] Press [PF5] key to store the adjustment value.	1) Adj item: [Receive Assist Voltage] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] Press [OK] button to store the adjustment value.							

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. MCF [Wide]	[Panel test mode] 1) CH-Sig: 2-1 Filter: W	[PC test mode] 1) Test Channel Channel: 2 Signaling: 1 Bandwidth: 5.0kHz/25.0kHz	Spectrum analyzer  Tracking generator	TX-RX	CN202 CN207	TX-RX	L239 L240 L241 L242	Adjust the coils to obtain the waveform as shown to below.	
	Spectrum analyzer setting Center-f: 73.05MHz Ref: -30dBm Span: 40kHz RBW: 10kHz VBW: 10kHz Sweep: 100mSec TG Level: -20dBm X dB/div: 2dB								
[Narrow]	2) Filter: N	2) Test Channel Channel: 2 Signaling: 1 Bandwidth: 2.5kHz/12.5kHz					L235 L236 L237 L238	Adjust the coils to obtain the waveform as shown to below.	
Spectrum analyzer setting Center-f: 73.05MHz Ref: -30dBm Span: 30kHz RBW: 10kHz VBW: 10kHz Sweep: 100mSec TG Level: -20dBm X dB/div: 2dB									
4. Quadrature coil adjust	[Panel test mode] 1) CH-Sig: 2-1 Filter: N	[PC test mode] 1) Channel: 2 Signaling: 1 Bandwidth: 2.5kHz/12.5kHz	DVM	TX-RX	Test Point QUAD	TX-RX	L234	Adjust the coil within the limit of the specified voltage.	1.0V±0.05V
5. RTC Correction	1) Adj item: [RTC] Adjust: [***]	1) Adj item: [RTC Collection]					[Panel tuning mode] Press [V] key. [PC test mode] Press [PF5] key to store the adjustment value. [Auto Tuning]	[Panel tuning mode] Press [V] key. After automatic adjustment adjusted value is displayed on LCD. [PC test mode] Press [Start] button of "Auto Tuning". Press [Apply] button to store the adjustment value after the automatic adjustment was Finished.	Adjustment of the transceiver's internal clock.

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. Frequency Adjustment *1	1) CH-Sig: 9-1 Talk-around Adj item: [TXF] Adjust: [***] PTT: ON Press [PF5] key to store the adjustment value.	1) Channel: 9 Talk-around Signaling: 1 Bandwidth: 2.5kHz/12.5kHz PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.	f. counter	Rear panel	ANT		[Panel tuning mode] [PF3] [PF4]  [PC test mode] [◀ ▶]	Change the adjustment value within the limit of the specified frequency.	869.95MHz±50Hz Note: After replacing the VCXO (X400) align frequency.


\*1 The reference oscillator frequency may drift due to shock (jarring the radio) or operating conditions. We recommend that the Frequency adjustment be checked each time the radio is serviced, or at least once per year. Maintenance should only be performed under 25°C±2°C.

## Transmitter Section

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency check	[Panel test mode] 1) CH-Sig: 9-1 Talk-around PTT: ON	[PC test mode] 1) Channel: 9 Talk-around Signaling: 1 PTT: Press [Transmit] button.	f. counter	Rear panel	ANT			Check @+25°C	±0.75ppm -652Hz~+652Hz @869.95MHz
2. Max Transmit Power	[Panel test mode] 1) CH-Sig: 9-1 Talk-around PTT: ON	[PC test mode] 1) Channel: 9 Talk-around Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Rear panel	ANT	TX-RX	VR1	40W	±2.0W
3. High Transmit Power	1) Adj item: [HPW] Adjust: [***] 2) Adj item: [7RL]→ [7RH]→[7TL]→ [7TH]→[8TL]→ [8TH]→[8RL]→ [8RH] Adjust: [***] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [High Transmit Power] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.	Power meter Ammeter	Rear panel	ANT		[Panel tuning mode] [7RL]: 28.5W [7RH]: 28.5W [7TL]: 28.5W [7TH]: 28.5W  [8TL]: 35.0W [8TH]: 35.0W [8RL]: 35.0W [8RH]: 35.0W  [PC test mode] [◀ ▶]	±1.0W  13.0A or less	



## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Medium Transmit Power	1) Adj item: [MPW] Adjust: [***] 2) Adj item: [7RL]→ [7RH]→[7TL]→ [8TL]→[8TH]→ [8RL]→[8RH] Adjust: [***] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [Mid Transmit Power] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.	Power meter Ammeter	Rear panel	ANT		[Panel tuning mode] [PF3] [PF4]  [PC test mode] [◀ ▶]	10W	±1.0W
5. Low Transmit Power	1) Adj item: [LPW] Adjust: [***] 2) Adj item: [7RL]→ [7RH]→[7TL]→ [8TL]→[8TH]→ [8RL]→[8RH] Adjust: [***] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [Low Transmit Power] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.						1.75W	±0.2W
6. Balance *3	1) Adj item: [BAL] Adjust: [***] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [7RL]→ [7RC]→[7RH]→ [7TL]→[7TC]→ [7TH]→[8TL]→ [8TC]→[8TH]→ [8RL]→[8RC]→ [8RH] Adjust: [***] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [Blance] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High]→ [TX Low]→ [TX Center]→ [TX High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High]→ [TX Low]→ [TX Center]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.	Deviation meter Oscilloscope	Rear panel	ANT		[Panel tuning mode] [PF3] [PF4]  [PC test mode] [◀ ▶]	Make the demodulation waves into square waves.	

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. Max Deviation *3 [Wide]	1) Adj item: [FMWD] Adjust: [***] Deviation meter LPF: 15kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [7RL]→ [7RH]→[7TL]→ [7TH]→[8TL]→ [8TH]→[8RL]→ [8RH] Adjust: [***] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [Max Deviation (Wide)] Deviation meter LPF: 15kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.	Deviation meter Oscilloscope	Rear panel	ANT		[Panel tuning mode] [PF3] [PF4]  [PC test mode] [◀ ▶]	4000Hz	$\pm$ 50Hz
Max Deviation [NPSPAC]	1) Adj item: [FMSD] Adjust: [***] 2) Adj item: [7RL]→ [7RH]→[7TL]→ [7TH]→[8TL]→ [8TH]→[8RL]→ [8RH] Adjust: [***] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [Max Deviation (NPSPAC)] Deviation meter LPF: 15kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.						Set it the adjustment value obtained from the [Max Deviation Adjust [Wide] adjustment of step 8).  3200Hz	$\pm$ 50Hz

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
Max Deviation [Narrow]	1) Adj item: [FMND] Adjust: [***] 2) Adj item: [7RL]→ [7RH]→[7TL]→ [7TH]→[8TL]→ [8TH]→[8RL]→ [8RH] Adjust: [***] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [Max Deviation(Narrow)] Deviation meter LPF: 15kHz HPF: OFF Detector: ±PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.	Deviation meter Oscilloscope	Rear panel	ANT		[Panel tuning mode] [PF3] [PF4]  [PC test mode] [◀ ▶]	Set it the adjustment value obtained from the [Max Deviation Adjust [Wide] adjustment of step 8).  2000Hz	±50Hz
8. P25 High Deviation *3	1) Adj item: [HDVA] Adjust: [***] Deviation meter LPF: 3kHz HPF: OFF Detector: ±PEAK/2 2) Adj item: [7RL]→ [7RH]→[7TL]→ [7TH]→[8TL]→ [8TH]→[8RL]→ [8RH] Adjust: [***] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [P25 High Deviation] Deviation meter LPF: 3kHz HPF: OFF Detector: ±PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.						Set it the adjustment value obtained from the [Max Deviation Adjust [Narrow] adjustment of step 8).  2827Hz	2771~2883Hz
9. MIC sensitivity check *2	1) Adj item: [MIC] Adjust: [129] Deviation meter LPF: 15kHz HPF: OFF Detector: ±PEAK/2 AG: 1kHz PTT: ON	1) Adj item: [Mic sensitivity] Deviation meter LPF: 15kHz HPF: OFF Detector: ±PEAK/2 Adjust: [129] AG: 1kHz PTT: Press [Transmit] button.	Deviation meter Oscilloscope AG AF VTVM	Rear panel	ANT		[Panel tuning mode] [PF3] [PF4]  [PC test mode] [◀ ▶]	Adjust AG input to get a standard MOD	5.0mV±1.5mV

\*2: The MIC sensitivity is related to the Max DEV adjustment. If the Max DEV has been adjusted correctly, the MIC sensitivity must be within 5mV±1.5mV at adjustment digit "129".

## ADJUSTMENT

Item	Condition		Measurement			Adjustment		Specifications / Remarks	
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts		Method
10. QT Fine Deviation *3 [Wide]	1) Adj item: [QTW] Adjust: [***] Deviation meter LPF: 3kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [7RH]→ [7TH]→[8TH]→ [8RH] Adjust: [***] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [QT Deviation (Wide)] Deviation meter LPF: 3kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA High]→ [TX High] [Frequency: 800 MHz Band] [RX/TA High]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.	Deviation meter Oscilloscope	Rear panel	ANT		[Panel tuning mode] [PF3] [PF4]  [PC test mode] [◀ ▶]	Write the value as followings. 133 (Reference value)  0.75kHz	$\pm$ 50Hz
QT Fine Deviation [NPSPAC]	1) Adj item: [QTS] Adjust: [***] 2) Adj item: [7RH]→ [7TH]→[8TH]→ [8RH] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [QT Deviation (NPSPAC)] Deviation meter LPF: 3kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA High]→ [TX High] [Frequency: 800 MHz Band] [RX/TA High]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.						Write the value as followings. 132 (Reference value)  0.60kHz	$\pm$ 40Hz
QT Fine Deviation [Narrow]	1) Adj item: [QTN] Adjust: [***] 2) Adj item: [7RH]→ [7TH]→[8TH]→ [8RH] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [QT Deviation (Narrow)] Deviation meter LPF: 3kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA High]→ [TX High] [Frequency: 800 MHz Band] [RX/TA High]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.						Write the value as followings. 132 (Reference value)  0.35kHz	$\pm$ 25Hz

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
11. DQT Fine Deviation *3 [Wide]	1) Adj item: [DQTW] Adjust: [***] Deviation meter LPF: 3kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [7RH]→ [7TH]→[8TH]→ [8RH] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [DQT Deviation (Wide)] Deviation meter LPF: 3kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA High]→ [TX High] [Frequency: 800 MHz Band] [RX/TA High]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.	Deviation meter Oscilloscope	Rear panel	ANT		[Panel tuning mode] [PF3] [PF4] [PC test mode] [◀ ▶]	Write the value as followings. 101 (Reference value) 0.75kHz	$\pm$ 50Hz
DQT Fine Deviation [NPSPAC]	1) Adj item: [DQTS] Adjust: [***] 2) Adj item: [7RH]→ [7TH]→[8TH]→ [8RH] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [DQT Deviation (NPSPAC)] Deviation meter LPF: 3kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA High]→ [TX High] [Frequency: 800 MHz Band] [RX/TA High]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.					Write the value as followings. 99 (Reference value) 0.60kHz	$\pm$ 40Hz	
DQT Fine Deviation [Narrow]	1) Adj item: [DQTN] Adjust: [***] 2) Adj item: [7RH]→ [7TH]→[8TH]→ [8RH] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [DQT Deviation (Narrow)] Deviation meter LPF: 3kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA High]→ [TX High] [Frequency: 800 MHz Band] [RX/TA High]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.					Write the value as followings. 99 (Reference value) 0.35kHz	$\pm$ 25Hz	

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
12. DTMF Deviation *3 [Wide]	1) Adj item: [DTMW] Adjust: [***] Deviation meter LPF: 15kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [7RH]→ [7TH]→[8TH]→ [8RH] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [DTMF Deviation (Wide)] Deviation meter LPF: 3kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA High]→ [TX High] [Frequency: 800 MHz Band] [RX/TA High]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.	Deviation meter Oscilloscope	Rear panel	ANT		[Panel tuning mode] [PF3] [PF4]  [PC test mode] [◀ ▶]	Write the value as followings. 170 (Reference value)  3.00kHz	$\pm$ 100Hz
DTMF Deviation [NPSPAC]	1) Adj item: [DTMS] Adjust: [***] 2) Adj item: [7RH]→ [7TH]→[8TH]→ [8RH] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [DTMF Deviation (NPSPAC)] Deviation meter LPF: 3kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA High]→ [TX High] [Frequency: 800 MHz Band] [RX/TA High]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.						Write the value as followings. 169 (Reference value)  2.40kHz	$\pm$ 80Hz
DTMF Deviation [Narrow]	1) Adj item: [DTMN] Adjust: [***] 2) Adj item: [7RH]→ [7TH]→[8TH]→ [8RH] PTT: ON Press [PF5] key to store the adjustment value.	1) Adj item: [DTMF Deviation (Narrow)] Deviation meter LPF: 3kHz HPF: OFF Detector: $\pm$ PEAK/2 2) Adj item: [Frequency: 700 MHz Band] [RX/TA High]→ [TX High] [Frequency: 800 MHz Band] [RX/TA High]→ [TX High] PTT: Press [Transmit] button. Press [OK] button to store the adjustment value.						Write the value as followings. 171 (Reference value)  1.50kHz	$\pm$ 50Hz

\*3: Necessary adjustment and order for each signaling is shown as next page.

## ADJUSTMENT

Mode	Signaling	Necessary adjustment and order		
		Wide	NPSPAC	Narrow
Analog	Audio	1. Balance adjust 2. Max Deviation adjust [Wide]	1. Balance adjust 2. Max Deviation adjust [NPSPAC]	1. Balance adjust 2. Max Deviation adjust [Narrow]
	QT	1. Balance adjust 2. Max Deviation adjust [Wide] 3. QT Deviation adjust [Wide]	1. Balance adjust 2. Max Deviation adjust [NPSPAC] 3. QT Deviation adjust [NPSPAC]	1. Balance adjust 2. Max Deviation adjust [Narrow] 3. QT Deviation adjust [Narrow]
	DQT	1. Balance adjust 2. Max Deviation adjust [Wide] 3. DQT Deviation adjust [Wide]	1. Balance adjust 2. Max Deviation adjust [NPSPAC] 3. DQT Deviation adjust [NPSPAC]	1. Balance adjust 2. Max Deviation adjust [Narrow] 3. DQT Deviation adjust [Narrow]
	DTMF	1. Balance adjust 2. Max Deviation adjust [Wide] 3. DTMF Deviation adjust [Wide]	1. Balance adjust 2. Max Deviation adjust [NPSPAC] 3. DTMF Deviation adjust [NPSPAC]	1. Balance adjust 2. Max Deviation adjust [Narrow] 3. DTMF Deviation adjust [Narrow]
P25		–	–	1. Balance adjust 2. P25 High Deviation adjust

## Receiver Section

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. AF level setting	<b>[Panel test mode]</b> 1) CH-Sig: 1-1 Filter: W SSG output: –47dBm (1mV) (MOD: 1kHz/±3kHz)	<b>[PC test mode]</b> 1) Channel: 1 Signaling: 1 Bandwidth: 2.5kHz/12.5kHz SSG output: –47dBm (MOD: 1kHz/±3kHz)	SSG DVM AF VTVM Dummy load (4ohm)	Rear panel	ANT Ext.SP connector		Volume knob	Turn the Volume knob to obtain 2.0V AF output. (2W @4ohm load)	2.0V±0.3V
2. Sensitivity check [Wide]	<b>[Panel test mode]</b> 1) CH-Sig: 1-1 Filter: W SSG output: –114dBm (0.45μV) (MOD: 1kHz/±3kHz) 2) CH-Sig: 2-1 3) CH-Sig: 3-1 4) CH-Sig: 7-1 5) CH-Sig: 8-1 6) CH-Sig: 9-1	<b>[PC test mode]</b> 1) Channel: 1 Signaling: 1 Bandwidth: 5.0kHz/25.0kHz SSG output: –114dBm (MOD: 1kHz/±3kHz) 2) Channel: 2 3) Channel: 3 4) Channel: 7 5) Channel: 8 6) Channel: 9	SSG AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector			Check	12dB SINAD or more
Sensitivity check [NPSPAC]	1) CH-Sig: 1-1 Filter: S SSG output: –114dBm (0.45μV) (MOD: 1kHz/±2.4kHz) 2) CH-Sig: 2-1 3) CH-Sig: 3-1 4) CH-Sig: 7-1 5) CH-Sig: 8-1 6) CH-Sig: 9-1	1) Channel: 1 Signaling: 1 Bandwidth: 4.0kHz/20.0kHz SSG output: –114dBm (MOD: 1kHz/±2.4kHz) 2) Channel: 2 3) Channel: 3 4) Channel: 7 5) Channel: 8 6) Channel: 9							

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
Sensitivity check [Narrow]	1) CH-Sig: 1-1 Filter: N SSG output: -114dBm (0.45μV) (MOD: 1kHz/±1.5kHz) 2) CH-Sig: 2-1 3) CH-Sig: 3-1 4) CH-Sig: 7-1 5) CH-Sig: 8-1 6) CH-Sig: 9-1	1) Channel: 1 Signaling: 1 Bandwidth: 2.5kHz/12.5kHz SSG output: -114dBm (MOD: 1kHz/±1.5kHz) 2) Channel: 2 3) Channel: 3 4) Channel: 7 5) Channel: 8 6) Channel: 9	SSG AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector			Check	12dB SINAD or more
3. Squelch Open [Wide]	1) Adj item: [SQOW] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: 12dB SINAD level for analog Wide -2.5dB (MOD: 1kHz/±3kHz) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [Squelch Open (Wide)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level for analog Wide -2.5dB (MOD: 1kHz/±3kHz) After input signal from SSG, press [Apply] button to store the adjustment value.	SSG AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector		[Panel tuning mode] [PF5]  [PC test mode] [Apply]	After input signal from SSG, press [PF5] key to store the adjustment value.	
Squelch Open [NPSPEC]	1) Adj item: [SQOS] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: 12dB SINAD level for analog NPSPEC -2.5dB (MOD: 1kHz/±2.4kHz) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item:[Squelch Open (Wide)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level for analog NPSPEC -2.5dB (MOD: 1kHz/±2.4kHz) After input signal from SSG, press [Apply] button to store the adjustment value.							



## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
Squelch Open [Narrow]	1) Adj item: [SQON] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: 12dB SINAD level for analog Narrow -2.5dB (MOD: 1kHz/±1.5kHz) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [Squelch Open (Narrow)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level for analog Narrow -2.5dB (MOD: 1kHz/±1.5kHz) After input signal from SSG, press [Apply] button to store the adjustment value.	SSG  AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector		[Panel tuning mode] [PF5]  [PC test mode] [Apply]	After input signal from SSG, press [PF5] key to store the adjustment value.	
Squelch Open [P25]	1) Adj item: [SQOA] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: 12dB SINAD level for analog Wide (MOD: 1kHz/±3kHz) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [Squelch Open (P25)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level for analog Wide (MOD: 1kHz/±3kHz) After input signal from SSG, press [Apply] button to store the adjustment value.							

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Squelch Tight [Wide]	1) Adj item: [SQTW] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: 12dB SINAD level for analog Wide +5dB (MOD: 1kHz/±3kHz) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [Squelch Tight (Wide)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level for analog Wide +5dB (MOD: 1kHz/±3kHz) After input signal from SSG, press [Apply] button to store the adjustment value.	SSG  AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector		[Panel tuning mode] [PF5]  [PC test mode] [Apply]	After input signal from SSG, press [PF5] key to store the adjustment value.	
Squelch Tight [NPSPAC]	1) Adj item: [SQTS] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: 12dB SINAD level for Analog NPSPAC +5dB (MOD: 1kHz/±2.4kHz) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [Squelch Tight (NPSPAC)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level for Analog NPSPAC +5dB (MOD: 1kHz/±2.4kHz) After input signal from SSG, press [Apply] button to store the adjustment value.							

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
Squelch Tight [Narrow]	1) Adj item: [SQTN] Adjust: [***] 2) Adj item: [7RL]→[7RC]→[7RH]→[8RL]→[8RC]→[8RH] SSG output: 12dB SINAD level for analog Narrow +6.5dB (MOD: 1kHz±1.5kHz) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [Squelch Tight (Narrow)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→[RX/TA Center]→[RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→[RX/TA Center]→[RX/TA High] SSG output: 12dB SINAD level for analog Narrow +6.5dB (MOD: 1kHz±1.5kHz) After input signal from SSG, press [Apply] button to store the adjustment value.	SSG  AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector		[Panel tuning mode] [PF5]  [PC test mode] [Apply]	After input signal from SSG, press [PF5] key to store the adjustment value.	
5. RSSI (Reference) [Wide]	1) Adj item: [RRSIW] Adjust: [***] 2) Adj item: [7RL]→[7RC]→[7RH]→[8RL]→[8RC]→[8RH] SSG output: -125dBm (0.126μV) (MOD: OFF) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [RSSI (reference) (Wide)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→[RX/TA Center]→[RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→[RX/TA Center]→[RX/TA High] SSG output: -125dBm (MOD: OFF) After input signal from SSG, press [Apply] button to store the adjustment value.	SSG  AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector		[Panel tuning mode] [PF5]  [PC test mode] [Apply]	After input signal from SSG, press [PF5] key to store the adjustment value.	
RSSI (Reference) [Narrow]	1) Adj item: [RRSIN] Adjust: [***] 2) Adj item: [7RL]→[7RC]→[7RH]→[8RL]→[8RC]→[8RH] SSG output: -125dBm (0.126μV) (MOD: OFF) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [RSSI (reference) (Narrow)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→[RX/TA Center]→[RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→[RX/TA Center]→[RX/TA High] SSG output: -125dBm (MOD: OFF) After input signal from SSG, press [Apply] button to store the adjustment value.							

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
RSSI (Reference) [P25]	1) Adj item: [RRSIA] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: -125dBm (0.126μV) (MOD: OFF) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [RSSI (reference) (P25)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: -125dBm (MOD: OFF) After input signal from SSG, press [Apply] button to store the adjustment value.	SSG  AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector		[Panel tuning mode] [PF5]  [PC test mode] [Apply]	After input signal from SSG, press [PF5] key to store the adjustment value.	
6. RSSI (-120dBm) [Wide]	1) Adj item: [LRSIW] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: -120dBm (0.22μV) (MOD: OFF) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [RSSI (-120dBm) (Wide)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: -120dBm (MOD: OFF) After input signal from SSG, press [Apply] button to store the adjustment value.	SSG  AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector		[Panel tuning mode] [PF5]  [PC test mode] [Apply]	After input signal from SSG, press [PF5] key to store the adjustment value.	
RSSI (-120dBm) [Narrow]	1) Adj item: [LRSIN] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: -120dBm (0.22μV) (MOD: OFF) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [RSSI (-120dBm) (Narrow)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: -120dBm (MOD: OFF) After input signal from SSG, press [Apply] button to store the adjustment value.							

## ADJUSTMENT

Item	Condition		Measurement			Adjustment		Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	
RSSI (-120dBm) [P25]	1) Adj item: [LRSIA] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: -120dBm (0.22μV) (MOD: OFF) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [RSSI (-120dBm) (P25)] 2) Adj item: [Frequen- cy: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: -120dBm (MOD: OFF) After input signal from SSG, press [Apply] button to store the adjust- ment value.	SSG  AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector		[Panel tuning mode] [PF5]  [PC test mode] [Apply]	After input signal from SSG, press [PF5] key to store the adjustment value.
7. RSSI (-70dBm) [Wide]	1) Adj item: [HRSIW] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: -70dBm (70.8μV) (MOD: OFF) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [RSSI (-70dBm) (Wide)] 2) Adj item: [Frequen- cy: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: -70dBm (MOD: OFF) After input signal from SSG, press [Apply] button to store the adjust- ment value.	SSG  AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector		[Panel tuning mode] [PF5]  [PC test mode] [Apply]	After input signal from SSG, press [PF5] key to store the adjustment value.
RSSI (-70dBm) [Narrow]	1) Adj item: [HRSIN] Adjust: [***] 2) Adj item: [7RL]→ [7RC]→[7RH]→ [8RL]→[8RC]→ [8RH] SSG output: -70dBm (70.8μV) (MOD: OFF) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [RSSI (-70dBm) (Narrow)] 2) Adj item: [Frequen- cy: 700 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: -70dBm (MOD: OFF) After input signal from SSG, press [Apply] button to store the adjust- ment value.						

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
RSSI (-70dBm) [P25]	1) Adj item: [HRSIA] Adjust: [***] 2) Adj item: [7RL]→[7RC]→[7RH]→[8RL]→[8RC]→[8RH] SSG output: -70dBm (70.8μV) (MOD: OFF) After input signal from SSG, press [PF5] key to store the adjustment value.	1) Adj item: [RSSI (-70dBm) (P25)] 2) Adj item: [Frequency: 700 MHz Band] [RX/TA Low]→[RX/TA Center]→[RX/TA High] [Frequency: 800 MHz Band] [RX/TA Low]→[RX/TA Center]→[RX/TA High] SSG output: -70dBm (MOD: OFF) After input signal from SSG, press [Apply] button to store the adjustment value.	SSG AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector		[Panel tuning mode] [PF5]  [PC test mode] [Apply]	After input signal from SSG, press [PF5] key to store the adjustment value.	

### Radio check Section

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency check	1) CH-Sig: 1-9 Talk-around PTT: ON	1) Channel: 9 Talk-around Signaling: 1 PTT: Press [Transmit] button.	f. counter	Rear panel	ANT			Check	±0.75ppm High frequency±652Hz @869.95MHz
2. High Transmit Power check	1) CH-Sig: 1-1 Talk-around TX Power: High power PTT: ON 2) CH-Sig: 2-1 Talk-around 3) CH-Sig: 3-1 Talk-around 4) CH-Sig: 1-1 5) CH-Sig: 2-1 6) CH-Sig: 3-1	1) Channel: 1 Talk-around Signaling: 1 Transmit Power: High PTT: Press [Transmit] button. 2) Channel: 2 Talk-around 3) Channel: 3 Talk-around 4) Channel: 1 5) Channel: 2 6) Channel: 3	Power meter Ammeter	Rear panel	ANT			Check	27W~30W 13.0 A or less
	7) CH-Sig: 7-1 8) CH-Sig: 8-1 9) CH-Sig: 9-1 10) CH-Sig: 7-1 Talk-around 11) CH-Sig: 8-1 Talk-around 12) CH-Sig: 9-1 Talk-around	7) Channel: 7 8) Channel: 8 9) Channel: 9 10) Channel: 7 Talk-around 11) Channel: 8 Talk-around 12) Channel: 9 Talk-around							35±15% 13.0 A or less

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Medium Transmit power check	1) CH-Sig: 1-1 Talk-around TX Power: Mid power PTT: ON 2) CH-Sig: 2-1 Talk-around 3) CH-Sig: 3-1 Talk-around 4) CH-Sig: 1-1 5) CH-Sig: 2-1 6) CH-Sig: 3-1	1) Channel: 1 Talk-around Signaling: 1 Transmit Power: Mid PTT: Press [Transmit] button. 2) Channel: 2 Talk-around 3) Channel: 3 Talk-around 4) Channel: 1 5) Channel: 2 6) Channel: 3	Power meter Ammeter	Rear panel	ANT			Check	10±15%
	7) CH-Sig: 7-1 8) CH-Sig: 8-1 9) CH-Sig: 9-1 10) CH-Sig: 7-1 Talk-around 11) CH-Sig: 8-1 Talk-around 12) CH-Sig: 9-1 Talk-around	7) Channel: 7 8) Channel: 8 9) Channel: 9 10) Channel: 7 Talk-around 11) Channel: 8 Talk-around 12) Channel: 9 Talk-around							
4. Low Transmit Power check	1) CH-Sig: 1-1 Talk-around TX Power: Low power PTT: ON 2) CH-Sig: 2-1 Talk-around 3) CH-Sig: 3-1 Talk-around 4) CH-Sig: 1-1 5) CH-Sig: 2-1 6) CH-Sig: 3-1	1) Channel: 1 Talk-around Signaling: 1 Transmit Power: Low PTT: Press [Transmit] button. 2) Channel: 2 Talk-around 3) Channel: 3 Talk-around 4) Channel: 1 5) Channel: 2 6) Channel: 3							1.5~2.0W
	7) CH-Sig: 7-1 8) CH-Sig: 8-1 9) CH-Sig: 9-1 10) CH-Sig: 7-1 Talk-around 11) CH-Sig: 8-1 Talk-around 12) CH-Sig: 9-1 Talk-around	7) Channel: 7 8) Channel: 8 9) Channel: 9 10) Channel: 7 Talk-around 11) Channel: 8 Talk-around 12) Channel: 9 Talk-around							

## ADJUSTMENT

Item	Condition		Measurement			Adjustment			Specifications / Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Sensitivity check [Wide]	1) CH-Sig: 1-1 Filter: W SSG output: -114dBm (0.45μV) (MOD: 1kHz/±3kHz) 2) CH-Sig: 2-1 3) CH-Sig: 3-1 4) CH-Sig: 7-1 5) CH-Sig: 8-1 6) CH-Sig: 9-1	1) Channel: 1 Signaling: 1 Bandwidth: 5.0kHz/25.0kHz SSG output: -114dBm (MOD: 1kHz/±3kHz) 2) Channel: 2 3) Channel: 3 4) Channel: 7 5) Channel: 8 6) Channel: 9	SSG AF VTVM Oscilloscope	Rear panel	ANT Ext.SP connector			Check	12dB SINAD or more
Sensitivity check [NPS PAC]	1) CH-Sig: 1-1 Filter: S SSG output: -114dBm (0.45μV) (MOD: 1kHz/±2.4kHz) 2) CH-Sig: 2-1 3) CH-Sig: 3-1 4) CH-Sig: 7-1 5) CH-Sig: 8-1 6) CH-Sig: 9-1	1) Channel: 1 Signaling: 1 Bandwidth: 4.0kHz/20.0kHz SSG output: -114dBm (MOD: 1kHz/±2.4kHz) 2) Channel: 2 3) Channel: 3 4) Channel: 7 5) Channel: 8 6) Channel: 9							
Sensitivity check [Narrow]	1) CH-Sig: 1-1 Filter: N SSG output: -114dBm (0.45μV) (MOD: 1kHz/±1.5kHz) 2) CH-Sig: 2-1 3) CH-Sig: 3-1 4) CH-Sig: 7-1 5) CH-Sig: 8-1 6) CH-Sig: 9-1	1) Channel: 1 Signaling: 1 Bandwidth: 2.5kHz/12.5kHz SSG output: -114dBm (MOD: 1kHz/±1.5kHz) 2) Channel: 2 3) Channel: 3 4) Channel: 7 5) Channel: 8 6) Channel: 9							



## TERMINAL FUNCTION

### Control unit (X53-4400-10)

Pin No	Name	I/O	Function
<b>CN1 (to TX-RX Unit CN13)</b>			
1	+B	I	Power supply voltage
2	+B	I	Power supply voltage
3	E	-	GND
<b>CN411 (to VGS)</b>			
1	VBUSY	I	BUSY signal (Active High)
2	PLAY	I	PLAY signal (Active High)
3	RXD1	I	Serial data input 1
4	TXD1	O	Serial data output 1
5	BSEL	O	Beat shift
6	EN	O	ENABLE (Active Low)
7	USEL	O	UART SPEED select
8	VRST	O	RESET
9	DE	-	DIGITAL GND
10	E	-	GND
11	AI	I	Audio input (3Vp-p)
12	Ao	O	Audio output (100mVp-p)
13	E	-	GND
14	5C	-	Common 5V
15	NC	-	No connection
16	NC	-	No connection
17	NC	-	No connection
18	NC	-	No connection
19	NC	-	No connection
20	NC	-	No connection
21	NC	-	No connection
22	NC	-	No connection
23	NC	-	No connection
24	NC	-	No connection
25	NC	-	No connection
26	8C	-	Common 8V
<b>CN457 (for Production)</b>			
1-20			

Pin No	Name	I/O	Function
<b>CN459 (to D-SUB 25pin connector)</b>			
1	NC	-	No connection
2	SB	-	Switched B
3	RXD2	I	Serial data input 2
4	AUXo2	O	Auxiliary output 2
5	TXD2	O	Serial data output 2
6	AUXo1	O	Auxiliary output 1
7	AUX I/o 9	I/O	Auxiliary Input/output 9
8	AFo	O	RX audio signal output
9	DI	I	Data signal Input
10	GND	-	GND
11	MI2	I	External MIC input
12	DEo	O	Detected signal output
13	GND	-	GND
14	AUX I/o 5	I/O	Auxiliary input/output 5
15	AUX I/o 8	I/O	Auxiliary input/output 8
16	AUX I/o 4	I/O	Auxiliary input/output 4
17	TXD3	O	Serial data output 3
18	AUX I/o 3	I/O	Auxiliary input/output 3
19	RXD3	I	Serial data input 3
20	AUX I/o 2	I/O	Auxiliary input/output 2
21	GND	-	GND
22	AUX I/o 1	I/O	Auxiliary input/output 1
23	AUX I/o 7	I/O	Auxiliary input/output 7
24	ME	-	MIC GND
25	AUX I/o 6	I/O	Auxiliary input/output 6
26	GND	-	GND
27	NC	-	No connection
28	NC	-	No connection
29	NC	-	No connection
30	NC	-	No connection

## TERMINAL FUNCTION

Pin No	Name	I/O	Function
<b>CN501 (to TX-RX Unit CN600)</b>			
1	E	-	GND
2	CV	I	Controlled voltage of VCO
3	FTEMP2	I	Final unit temperature 2
4	FTEMP1	I	Final unit temperature 1
5	PCS	O	Chip select of potentiometer
6	L2FT	O	Tuning frequency of 2nd local
7	UL	I	Lock detect of PLL
8	EP	O	Enable of PLL
9	W $\bar{N}$ 2	-	Switch of ceramic filter (H: Wide/L: Narrow)
10	Mo	O	Modulation signal for VCO
11	MB	O	Modulation and frequency control signal for VCXO
12	8C	-	Common 8V
13	8C	-	Common 8V
14	8C	-	Common 8V
15	8C	-	Common 8V
16	DAT	O	DATA
17	SoE	O	Enable of shift register 3
18	CLK	O	CLOCK
19	STRB3	O	Chip select of shift register 3
20	8T	-	8V output during transmission
21	Vref	-	Reference voltage
22	E	-	GND
23	DET	I	Detection signal output
24	E	-	GND
25	PC	O	TX Power controlled voltage
26	E	-	GND
27	IF_IN	I	IF signal
28	IF_IN	I	IF signal
29	IF_IN	I	IF signal
30	E	-	GND
31	E	-	GND
32	E	-	GND
33	ASQL	I	Analog squelch signal output
34	RSSI	I	RSSI signal output
35	TV	O	Tuning voltage signal input for RX BPF
36	E	-	GND

Pin No	Name	I/O	Function
<b>CN502 (to ACC 9pin connector)</b>			
1	IGN	I	Ignition sense Input.
2	E	-	Earth
3	HR1	O	Horn alert signal output 1. (1A max)
4	HR2	O	Horn alert signal output 2. (1A max)
5	oS2	O	BTL output for external speaker B (PA).
6	oS1	O	BTL output for external speaker B (PA).
7	ES2	O	BTL output for external speaker A.
8	ES1	O	BTL output for external speaker A.
9	IRS	I	Remote speaker switch.
<b>CN503 (to KRK)</b>			
1	AFo	O	RX audio signal output for Head 2
2	DE3	I/O	Detection signal
3	E	-	GND
4	EI	O	ENABLE of shift register
5	CLK	O	CLOCK
6	DAT	O	DATA
7	RESET	O	RESET
8	5C	-	Common 5V
9	PSC	I/O	Power switch control signal
10	CS	O	Chip select of D/A converter
<b>CN504 (to Display Unit CN1)</b>			
1	ES2	O	Output for remote speaker
2	IRS	O	Output for remote speaker
3	SB	O	Switched B
4	IGN	I	Ignition sense Input.
5	PSW	I	Power switch control signal input
6	TRD	I/O	TX data output/RX data input
7	1/2	O	Remote head 1 signal output
8	RESET	O	RESET
9	GND	-	GND
10	MIC	I	MIC signal input
11	ME	I	MIC GND

## TERMINAL FUNCTION

### TX-RX unit (X57-7610-10)

Pin No	Name	I/O	Function
<b>CN13 (to Control Unit CN702)</b>			
1	E	-	GND
2	+B	O	DC input 13.6V±15%
3	+B	O	DC input 13.6V±15%
<b>CN14 (to DC cable)</b>			
1	+B	I	DC input 13.6V±15%
<b>CN202 (for MCF Adjustment)</b>			
1	MCFin	I	MCF input
2	E	-	GND
<b>CN207 (for MCF Adjustment)</b>			
1	MCFout	O	MCF output
2	E	-	GND
<b>CN600 (to Control Unit CN501)</b>			
1	E	-	GND
2	NC	-	No connection
3	RSSI	O	RSSI signal output
4	ASQL	O	Analog squelch signal output
5	E	-	GND
6	E	-	GND
7	E	-	GND
8	IF_IN	O	IF signal
9	IF_IN	O	IF signal
10	IF_IN	O	IF signal
11	E	-	GND
12	PC	-	TX Power controlled voltage
13	E	-	GND
14	DET	O	Detection signal output
15	E	-	GND
16	NC	-	NC
17	8T	-	8V output during transmission
18	STRB3	I	Chip select of shift Register 3
19	CLK	I	CLOCK
20	SOE3	I	Enable of shift register 3
21	DAT	I	DATA
22	8C	-	Common 8V
23	8C	-	Common 8V
24	8C	-	Common 8V
25	8C	-	Common 8V
26	MB	I	Modulation and frequency control signal for VCXO
27	MO	I	Modulation signal for VCO
28	W $\bar{N}$ 2	-	Switch of ceramic filter (H: Wide/L: Narrow)
29	EP	I	Enable of PLL

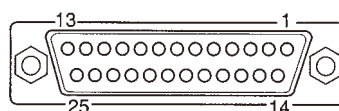
Pin No	Name	I/O	Function
30	UL	O	Lock detect of PLL
31	NC	-	No connection
32	PCS	I	Chip select of potentiometer
33	FTEMP1	O	Final unit temperature 1
34	FTEMP2	O	Final unit temperature 2
35	CV	O	Controlled voltage of VCO
36	E	-	GND

## TERMINAL FUNCTION

### D-SUB 25pin connector

Pin No	Name	I/O	Function
1	NC (RSSI)	O	NC/(RSSI signal output)
2	RXD2	I	Serial data input 2
			RS-232C Level ( $\pm 30V$ max.) $L \leq 0.4V$ $H \geq 2.4V$ $Z_i \geq 5k\Omega$
3	TXD2	O	Serial data output 2
			RS-232C Level $L \leq -5V$ $H \geq 5V/3k\Omega$ load $Z_o \leq 2k\Omega$
4	AUX I/O 9 (RTS)	I/O	Auxiliary input/output 9 (FPU selectable)/(RTS) Active Low with $47k\Omega$ pull up to 5V $L \leq 0.8V$ $H \geq 4.2V$
5	DI (CTS)	I	Data signal input $Z_i \geq 10k\Omega$ /(CTS) Deviation: 60% Dev or more (at 1kHz/2Vp-p) Frequency Response: +3~-3dB (20Hz~9.6kHz) (0dB: 1kHz 60% Dev.)
6	MI2	I	External MIC input $Z_i = 600\Omega$ Deviation: 60% Dev (at 1kHz/5 $\pm 2mV$ input) Frequency response: compliance with TIA/EIA-603
7	E	-	Earth
8	AUX I/O 8	I/O	Auxiliary input/output 8 (FPU selectable) Active Low with $47k\Omega$ pull up to 5V $L \leq 0.8V$ $H \geq 4.2V$
9	TXD3	O	Serial data output 3 Default: CMOS Level $L \leq 0.7V$ $H \geq 4.2V/25k\Omega$ load $Z_o \leq 1k\Omega$ After remodeling: RS-232C Level $L \leq -5V$ $H \geq 5V/3k\Omega$ load $Z_o \leq 2k\Omega$
10	RXD3	I	Serial data input 3 Default: CMOS Level (0~5V max) $L \leq 0.8V$ $H \geq 4.2V$ After remodeling: RS-232C Level ( $\pm 30V$ max) $L \leq -5V$ $H \geq 5V$
11	E	-	Earth
12	AUX I/O 7	I/O	Auxiliary input/output 7 (FPU selectable) Active Low with $47k\Omega$ pull up to 5V $L \leq 0.8V$ $H \geq 4.2V$
13	AUX I/O 6	I/O	Auxiliary input/output 6 (FPU selectable) Active Low with $47k\Omega$ pull up to 5V $L \leq 0.8V$ $H \geq 4.2V$
14	SB	-	Switched B (13.6V $\pm 15\%$ ) 2A max
15	AUXO 2	O	Auxiliary output 2 (FPU selectable) Active Low: open collector (MAX 500mA)
16	AUXO 1	O	Auxiliary output 1 (FPU selectable) Active Low: open collector (MAX 500mA)

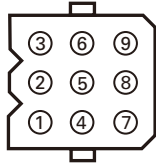
Pin No	Name	I/O	Function
17	AFO	O	RX audio signal output $Z_o \leq 1k\Omega$ PA: MIC signal output 0.65Vp-p typ. (1kHz/5mV input) RX: RX low level output (W) 1.3Vp-p typ. (N) 1.1Vp-p typ. (at Standard modulation)
18	E	-	Earth
19	DEO	O	Detected signal output $Z_o \leq 600k\Omega$ 500mVp-p (at 1kHz 60% Dev./-53dBm) frequency response (0dB: 1kHz 60% Dev.) (wide) 20Hz~4.8kHz: +1/-6dB 4.8kHz~9.6kHz: +1/-24dB (narrow) 20Hz~4.8kHz: +1/-15dB
20	AUX I/O 5	I/O	Auxiliary input/output 5 (FPU selectable) Active Low with $47k\Omega$ pull up to 5V $L \leq 0.8V$ $H \geq 4.2V$
21	AUX I/O 4	I/O	Auxiliary input/output 4 (FPU selectable) Active Low with $47k\Omega$ pull up to 5V $L \leq 0.8V$ $H \geq 4.2V$
22	AUX I/O 3	I/O	Auxiliary input/output 3 (FPU selectable) Active Low with $47k\Omega$ pull up to 5V $L \leq 0.8V$ $H \geq 4.2V$
23	AUX I/O 2	I/O	Auxiliary input/output 2 (FPU selectable) Active Low with $47k\Omega$ pull up to 5V $L \leq 0.8V$ $H \geq 4.2V$
24	AUX I/O 1	I/O	Auxiliary input/output 1 (FPU selectable) Active Low with $47k\Omega$ pull up to 5V $L \leq 0.8V$ $H \geq 4.2V$
25	ME	-	MIC earth



## TERMINAL FUNCTION

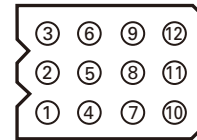
### Accessory 9pin connector

Pin No	Name	I/O	Function
1	IGN	I	Ignition sense input.
2	ES2	O	BTL output for external speaker A.
3	RS1	I	Remote speaker switch.
4	HR1	O	Horn alert signal output1. (1A max)
5	HR2	O	Horn alert signal output2. (1A max)
6	ES1	O	BTL output for external speaker A.
7	OS1	O	BTL output for external speaker B (PA).
8	OS2	O	BTL output for external speaker B (PA).
9	E	-	Earth



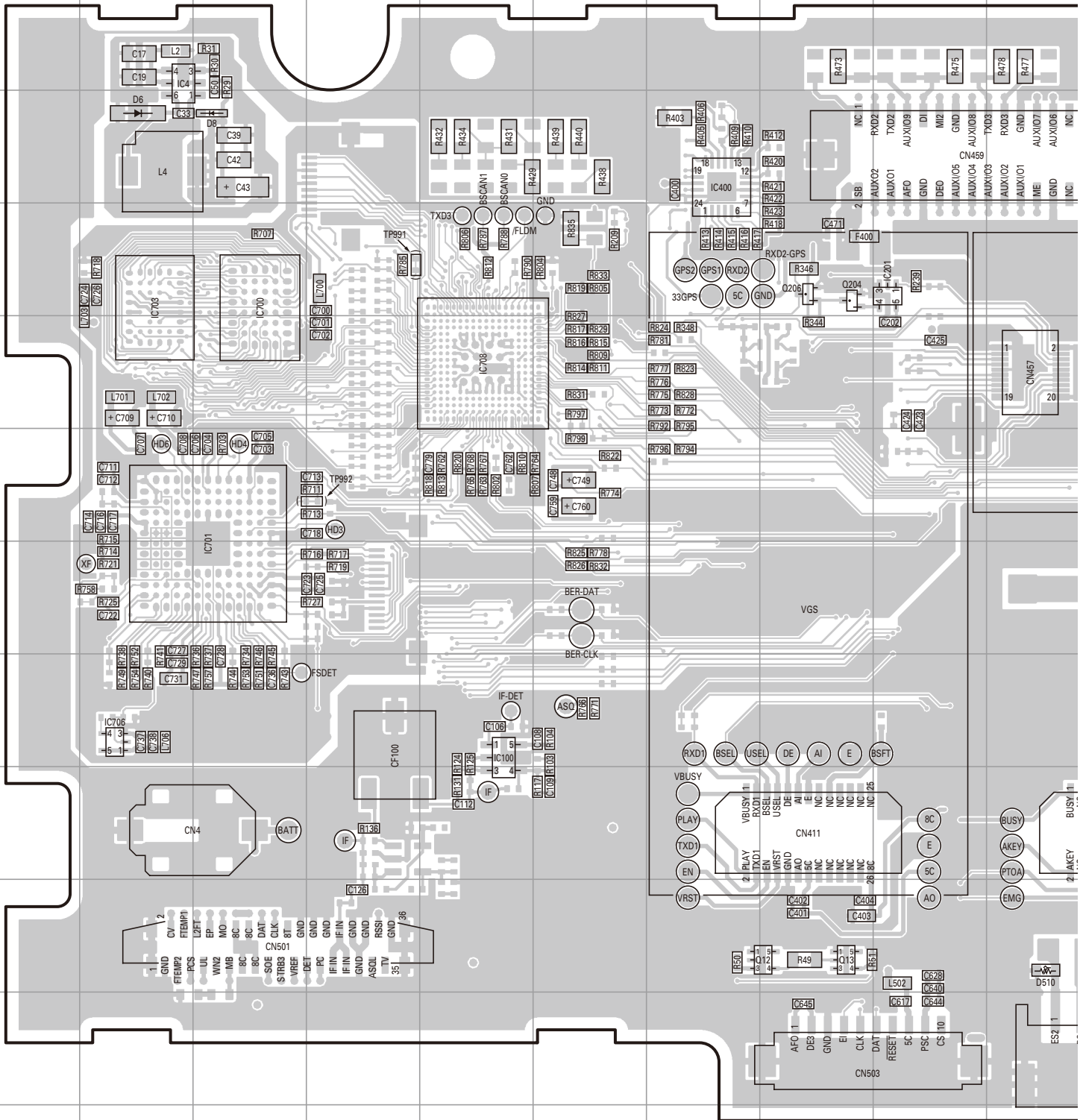
### Accessory 12pin connector (Head)

Pin No	Name	I/O	Function
1	IGN	I	Ignition sense input.
2	SB	O	Switched B (High power: 13.6V±15%/Mid power: 13.6V±15%)
3	E	-	Earth
4	MIC	I	MIC signal input/60% Dev at 1kHz/5±2mV input
5	ME	-	MIC earth
6	AI1	I	Auxiliary input 1 (FPU selectable)
7	AI2	I	Auxiliary input 2 (FPU selectable)
8	Ao1	O	Auxiliary output 1 (FPU selectable) (Open Collector)/500mA MAX
9	Ao2	O	Auxiliary output 2 (FPU selectable) (Open Collector)/500mA MAX
10	RS1	O	Remote speaker output
11	RS2	O	Remote speaker output
12	NC	-	No connection.



# TK-5910(B) PC BOARD

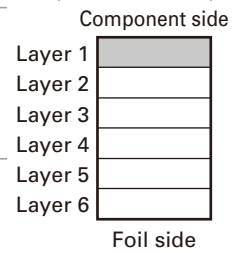
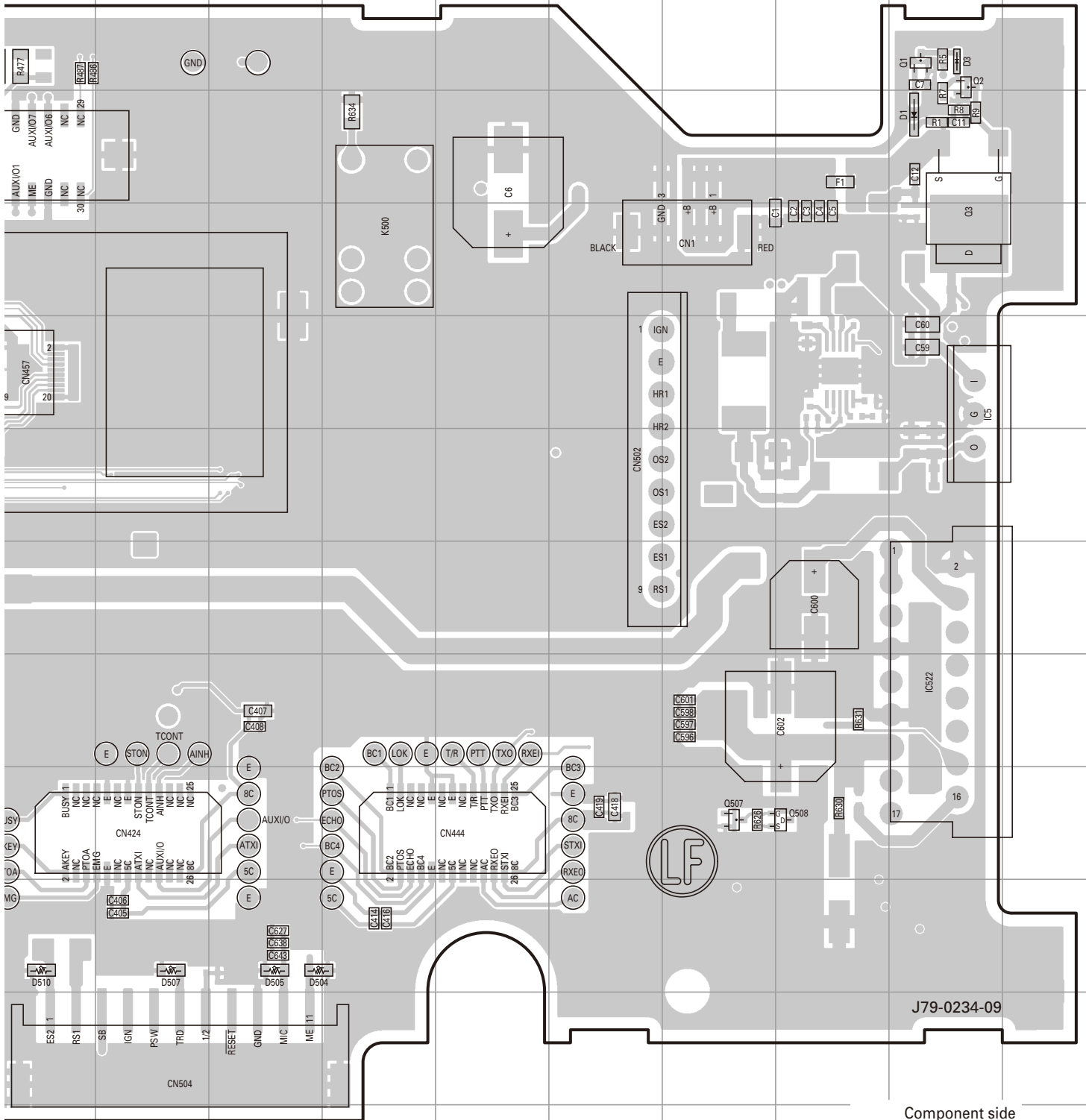
## CONTROL UNIT (X53-4400-10) Component side view (J79-0234-09)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC4	2B	IC700	4C	Q2	2R	Q507	9P	D504	10L
IC5	5R	IC701	7C	Q3	4R	Q508	9Q	D505	10L
IC100	8E	IC703	4B	Q12	10H	D1	3R	D507	10K
IC201	4I	IC706	8B	Q13	10H	D3	2R	D510	10J
IC400	3G	IC708	5E	Q204	4H	D6	3B		
IC522	8R	Q1	2R	Q206	4H	D8	3C		

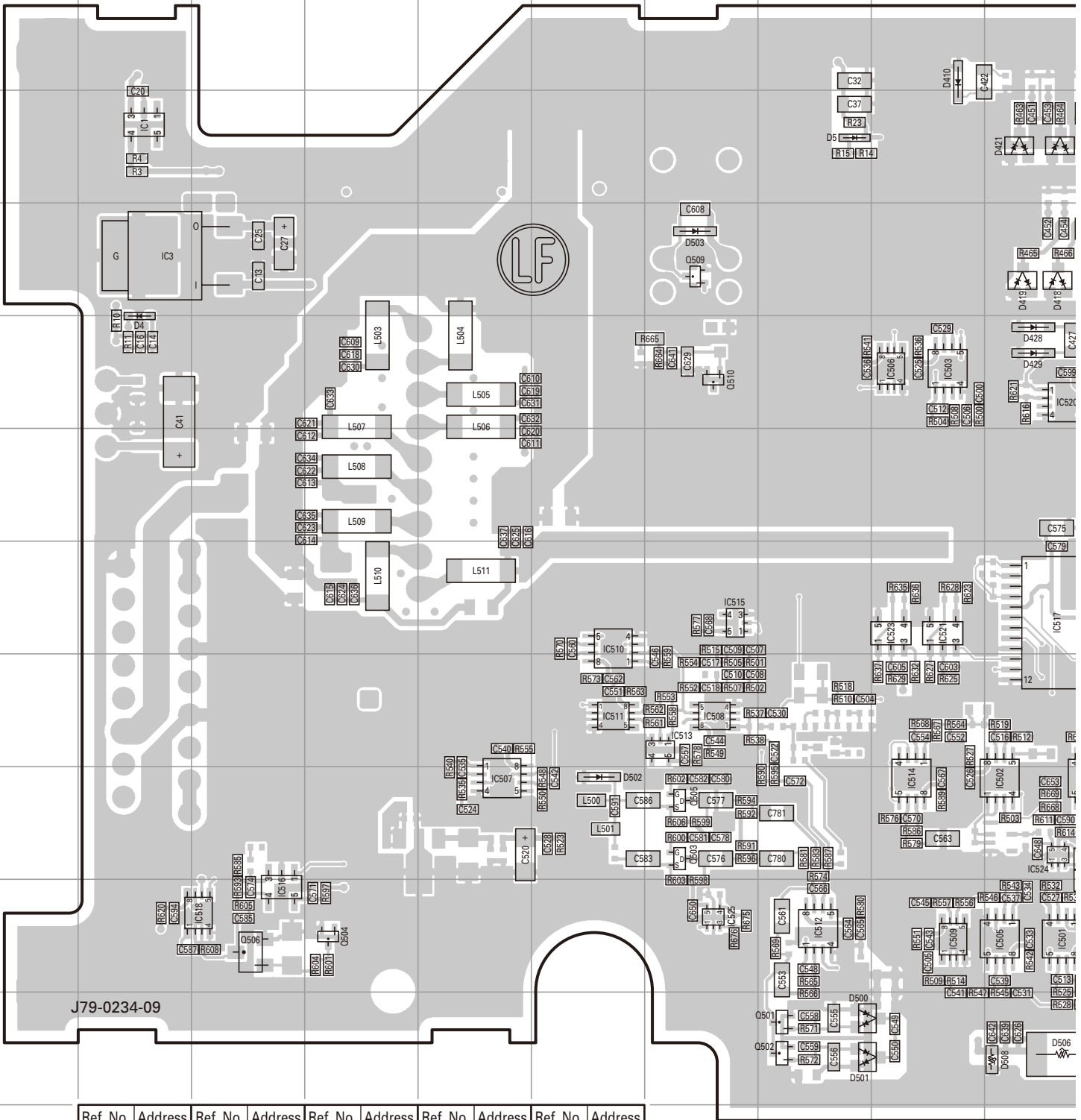
# PC BOARD TK-5910(B)

## CONTROL UNIT (X53-4400-10) Component side view (J79-0234-09)



# TK-5910(B) PC BOARD

## CONTROL UNIT (X53-4400-10) Foil side view (J79-0234-09)

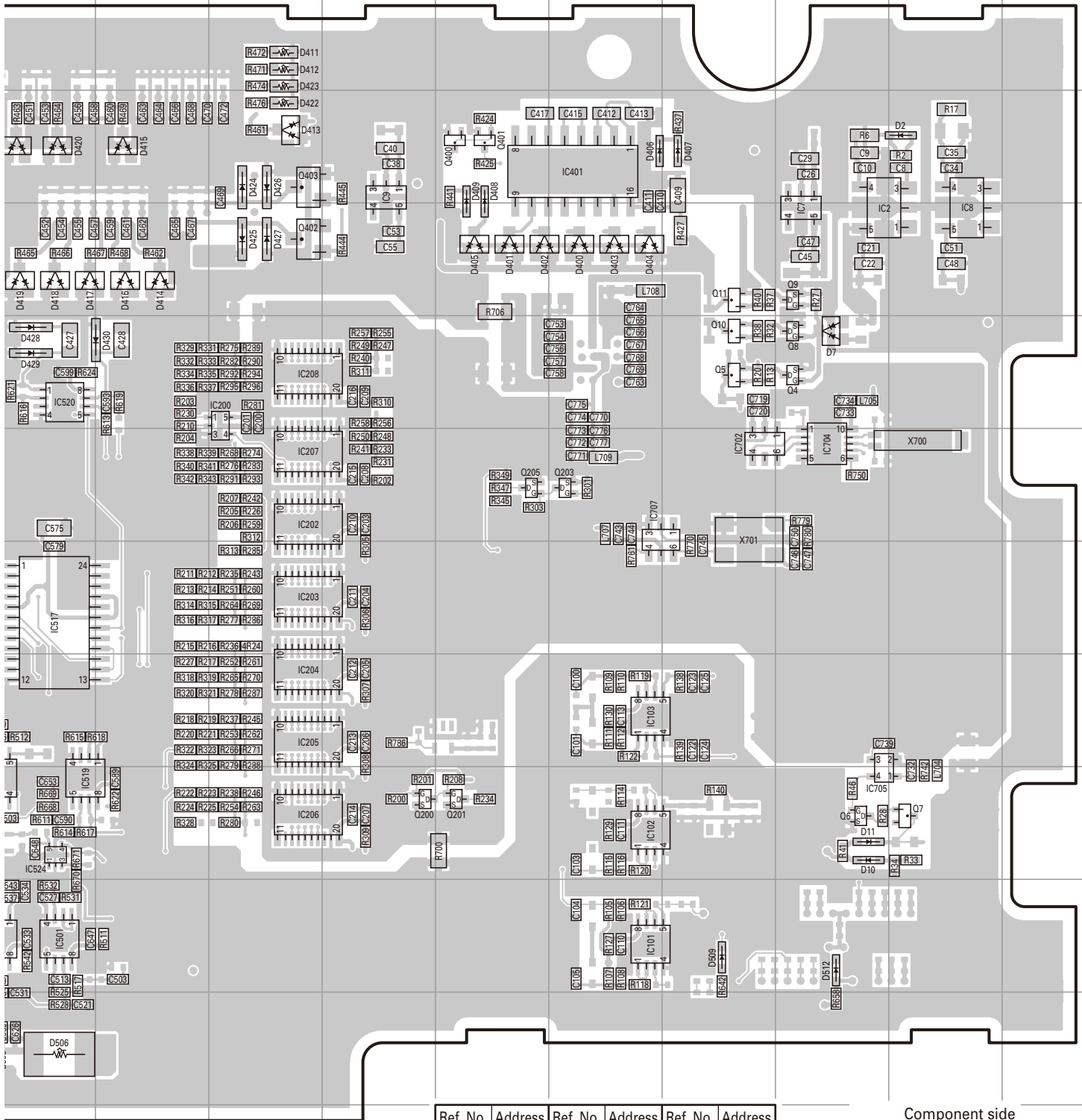


Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	3B	IC200	5L	IC501	10J	IC511	8F	IC520	5J								
IC2	4Q	IC202	6L	IC502	9J	IC512	10H	IC521	7I								
IC3	4B	IC203	7L	IC503	5I	IC513	8G	IC523	7I	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC7	4Q	IC204	8L	IC505	10J	IC514	9I	IC524	9J	Q4	5Q	Q10	5P	Q400	3N	Q503	9C
IC8	4R	IC205	8L	IC506	5I	IC515	7G	IC525	10G	Q5	5P	Q11	4P	Q401	3N	Q504	10I
IC9	3M	IC206	9L	IC507	9E	IC516	10C	IC702	6P	Q6	9Q	Q200	9M	Q402	4L	Q505	9C
IC101	10O	IC207	6L	IC508	8G	IC517	7J	IC704	6Q	Q7	9R	Q201	9N	Q403	3L	Q506	10I
IC102	9O	IC208	5L	IC509	10I	IC518	10C	IC705	9Q	Q8	5Q	Q203	6O	Q501	11H	Q509	4C
IC103	8O	IC401	3O	IC510	7F	IC519	9J	IC707	6O	Q9	4Q	Q205	6N	Q502	11H	Q510	5C

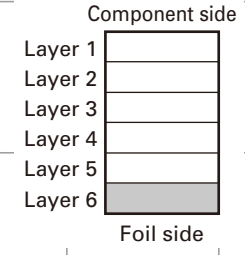


# PC BOARD TK-5910(B)

## CONTROL UNIT (X53-4400-10) Foil side view (J79-0234-09)

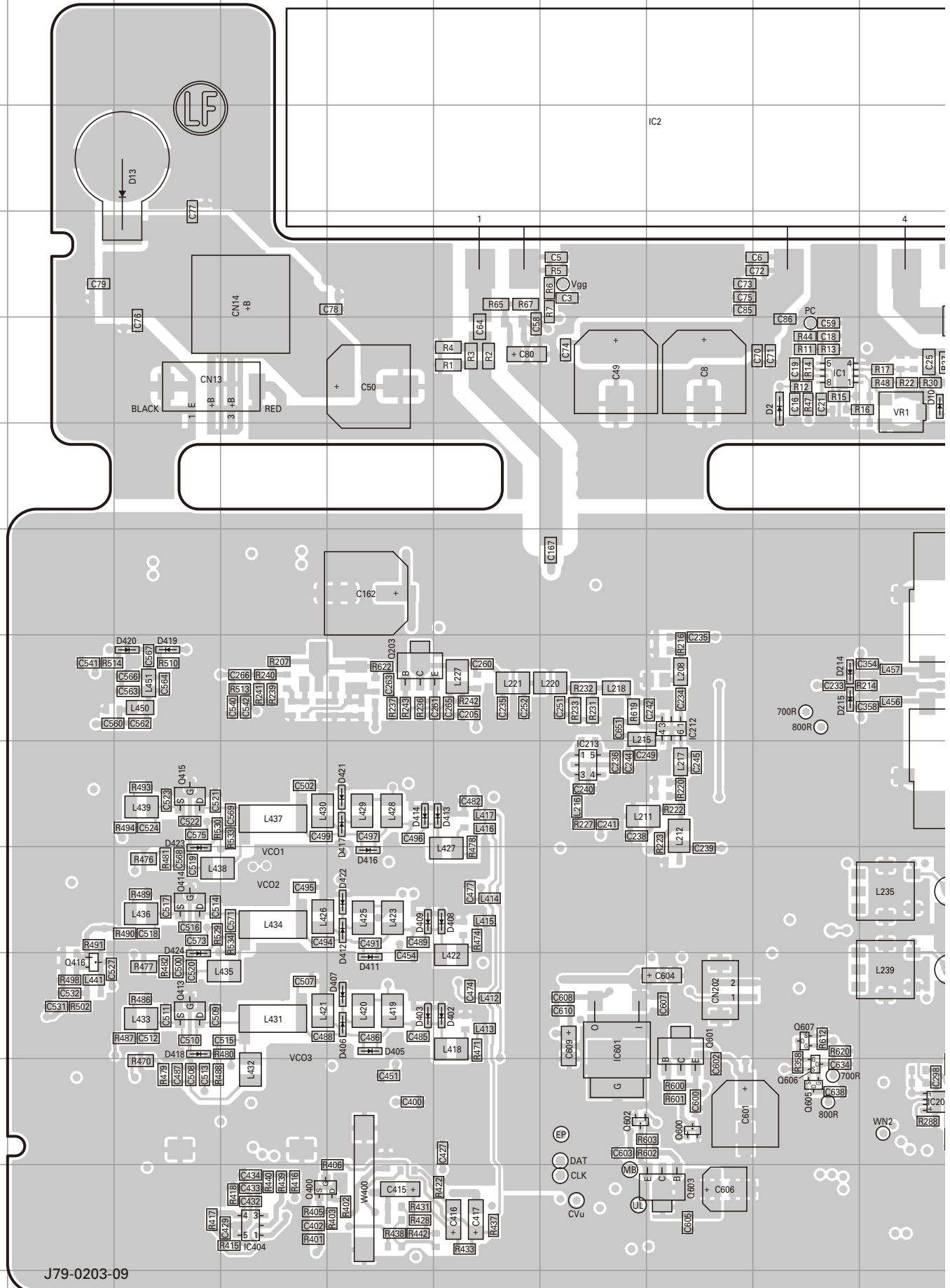


No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
503	9G	D2	3R	D400	4O	D406	3O	D414	4K	D423	2L
504	10D	D4	5B	D401	4N	D407	3P	D415	3K	D424	3L
505	9G	D5	3H	D402	4N	D408	3N	D416	4K	D425	4L
506	10C	D7	5Q	D403	4O	D409	3N	D417	4J	D426	3L
509	4G	D10	9Q	D404	4O	D410	2I	D418	4J	D427	4L
510	5G	D11	9Q	D405	4N	D411	2L	D419	4J	D428	5J
						D412	2L	D420	3J	D429	5J
						D413	3L			D500	11H
						D414	4K			D501	11H
						D415	3K			D502	9F
						D416	4K			D503	4G
						D417	4J			D506	11J
						D418	4J			D508	11J
						D419	4J			D509	10P
						D420	3J			D512	10Q



# TK-5910(B) PC BOARD

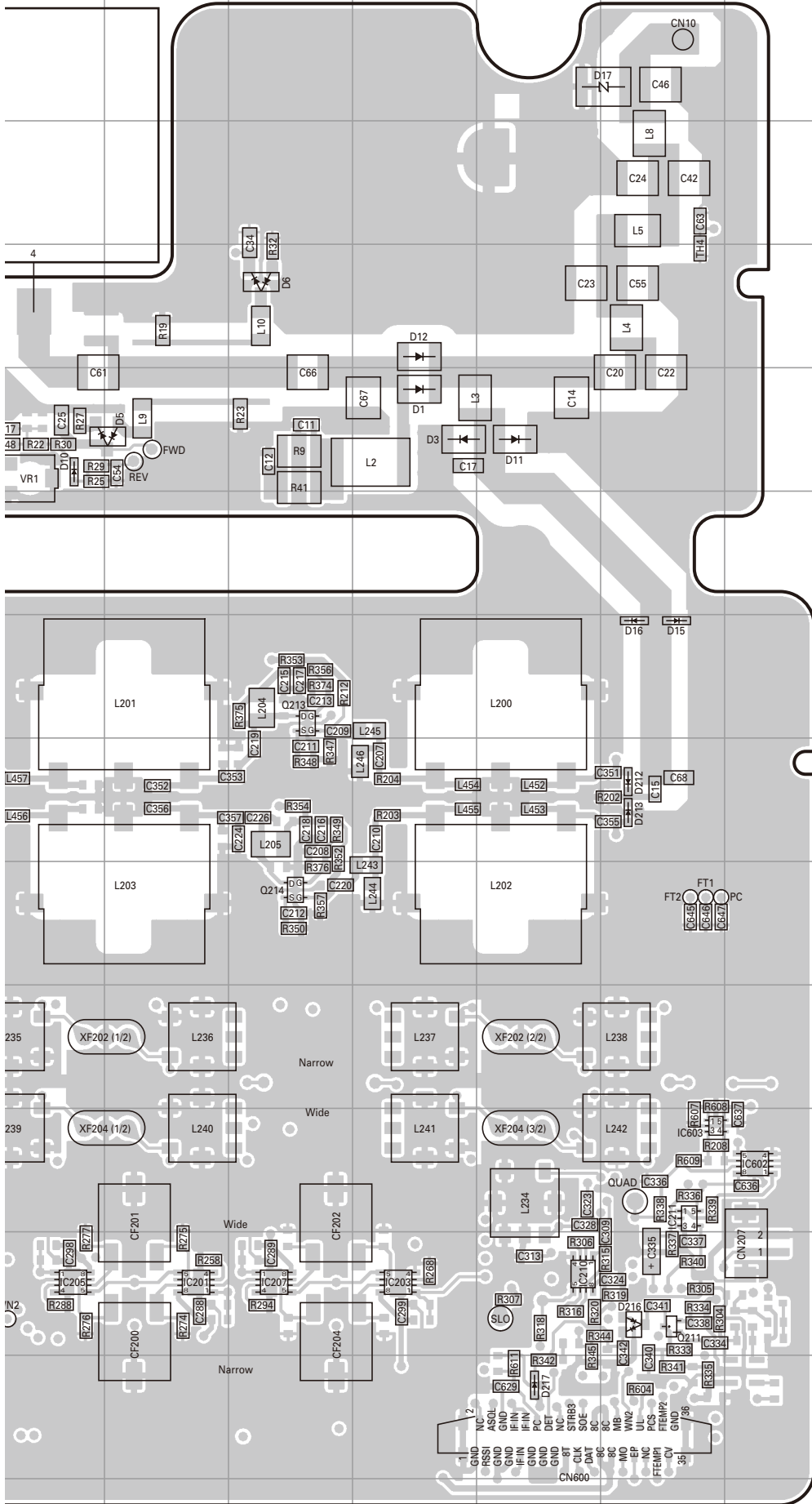
TX-RX UNIT (X57-7610-10) Component side view (J79-0203-09)



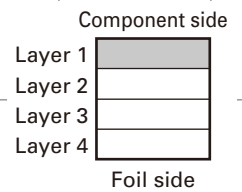
J79-0203-09

# PC BOARD TK-5910(B)

## TX-RX UNIT (X57-7610-10) Component side view (J79-0203-09)

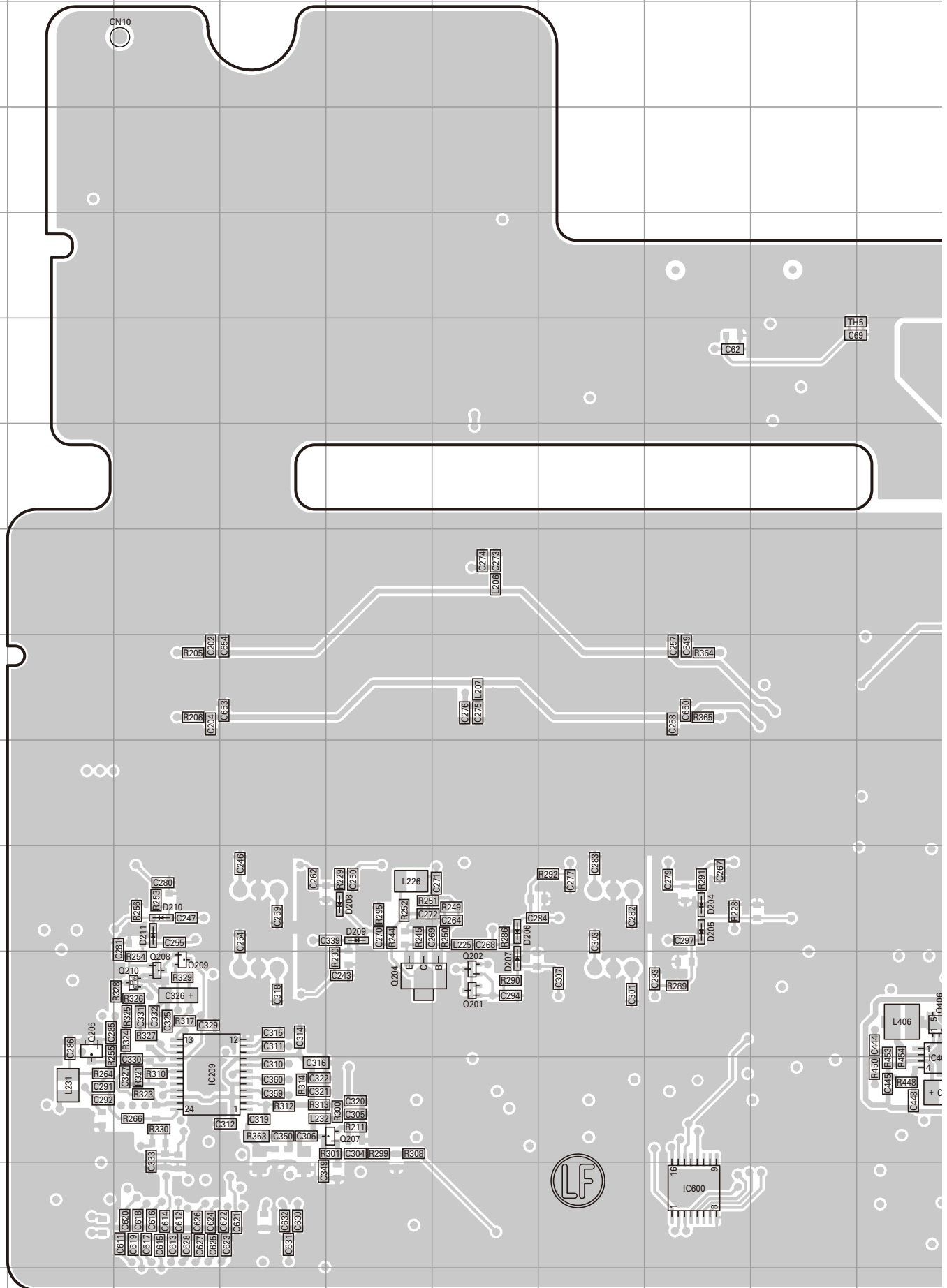


Ref. No.	Address	Ref. No.	Address
IC1	5I	D6	4L
IC2	3H	D10	5J
IC201	12K	D11	5N
IC203	12M	D12	4M
IC205	12J	D13	3C
IC207	12L	D15	7O
IC210	12N	D16	7O
IC211	11O	D17	2O
IC212	8H	D212	8O
IC213	9G	D213	8O
IC404	13D	D214	8I
IC601	11G	D215	8I
IC602	11P	D216	12O
IC603	11O	D217	13N
Q203	8E	D402	11F
Q211	12O	D403	11E
Q213	7L	D405	11E
Q214	9L	D406	11E
Q400	13D	D407	11E
Q413	11C	D408	10F
Q414	10C	D409	10E
Q415	9C	D411	11E
Q416	11B	D412	10E
Q600	12H	D413	9F
Q601	11H	D414	9E
Q602	12G	D416	10E
Q603	13H	D417	9E
Q605	12I	D418	11C
Q606	12I	D419	8C
Q607	11I	D420	8C
D1	5M	D421	9E
D2	5I	D422	10E
D3	5M	D423	10C
D5	5K	D424	11C



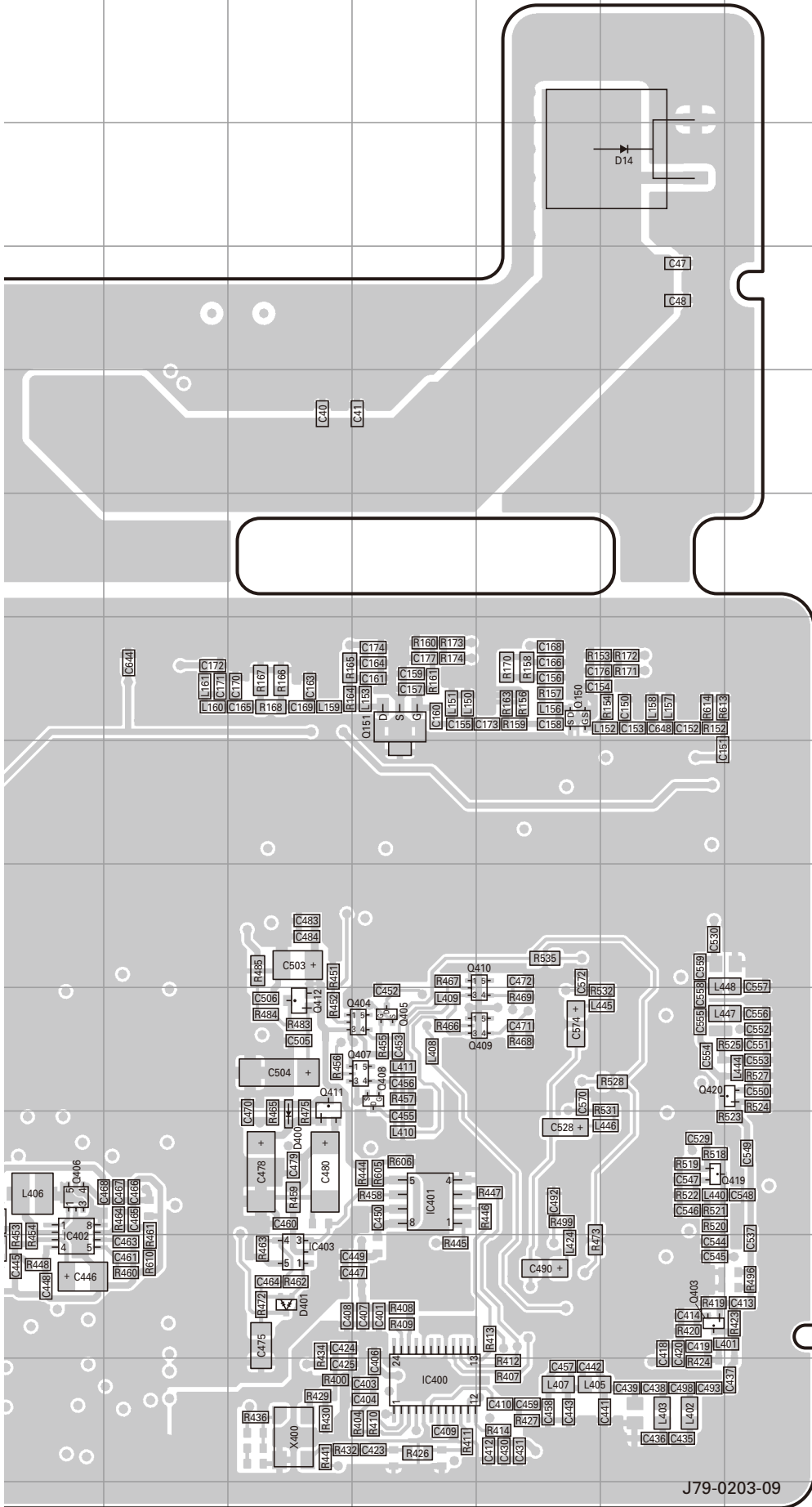
# TK-5910(B) PC BOARD

TX-RX UNIT (X57-7610-10) Foil side view (J79-0203-09)

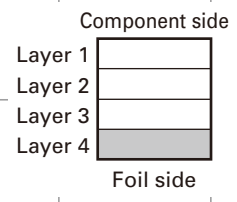


# PC BOARD TK-5910(B)

TX-RX UNIT (X57-7610-10) Foil side view (J79-0203-09)

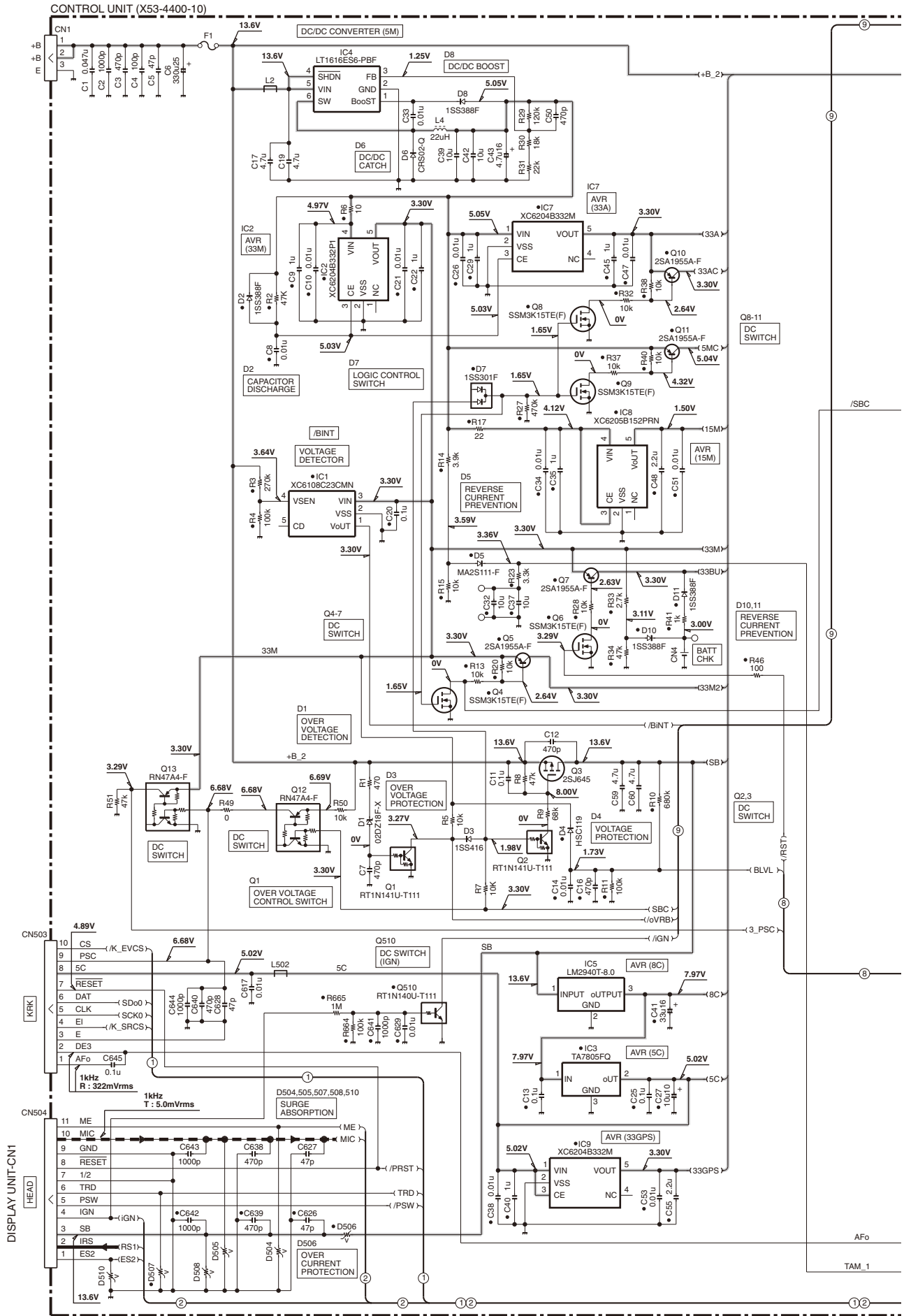


Ref. No.	Address
IC209	12C
IC400	13M
IC401	11M
IC402	12J
IC403	12L
IC600	13H
Q150	7N
Q151	7M
Q201	11F
Q202	11F
Q204	11E
Q205	11B
Q207	12E
Q208	11C
Q209	11C
Q210	11C
Q403	12O
Q404	10M
Q405	10M
Q406	11J
Q407	10M
Q408	10M
Q409	10N
Q410	9N
Q411	10L
Q412	10L
Q419	11O
Q420	10O
D14	3O
D204	10H
D205	10H
D206	10F
D207	11F
D208	10E
D209	10E
D210	10C
D211	10C
D400	11L
D401	12L



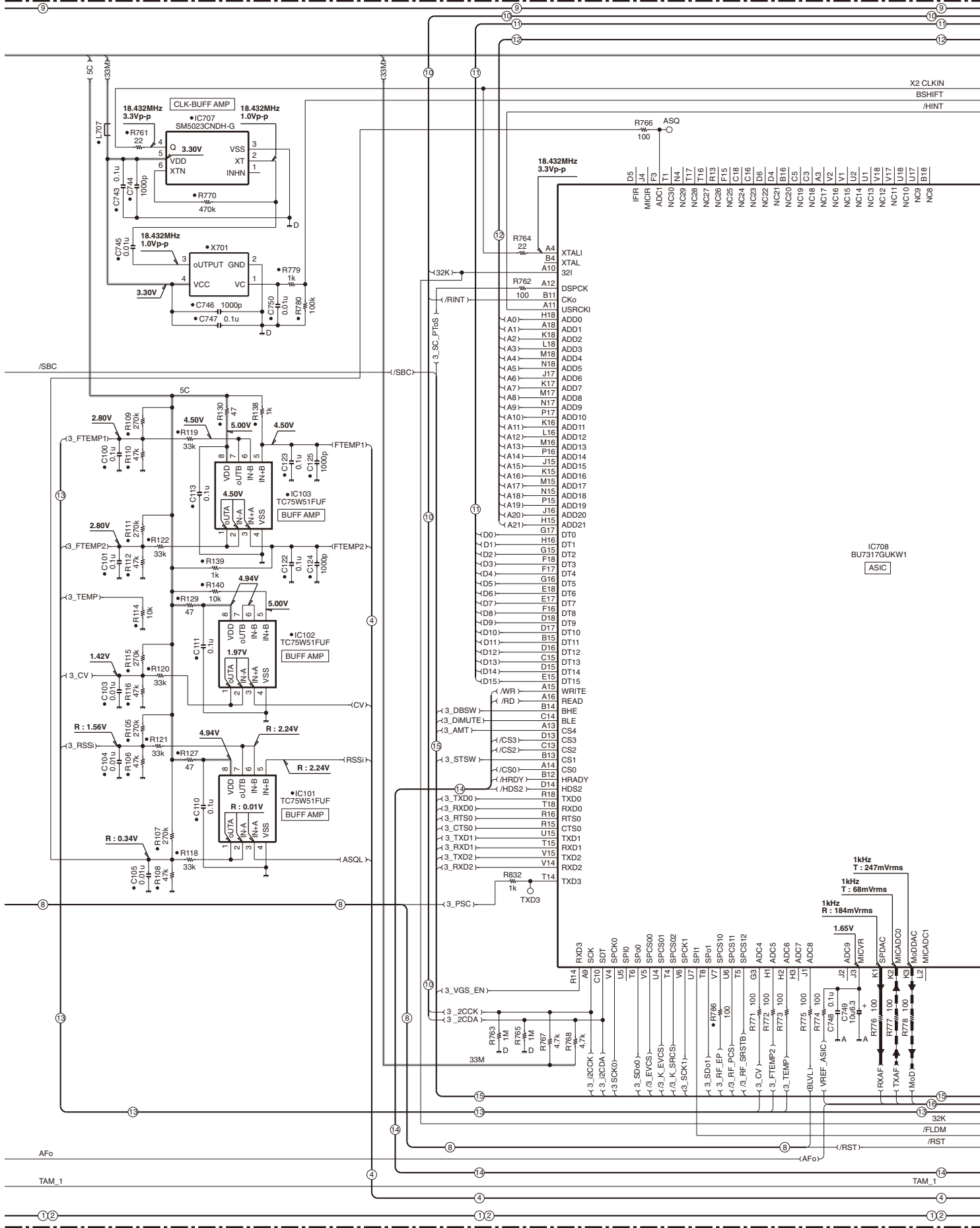
J79-0203-09

# TK-5910(B) SCHEMATIC DIAGRAM



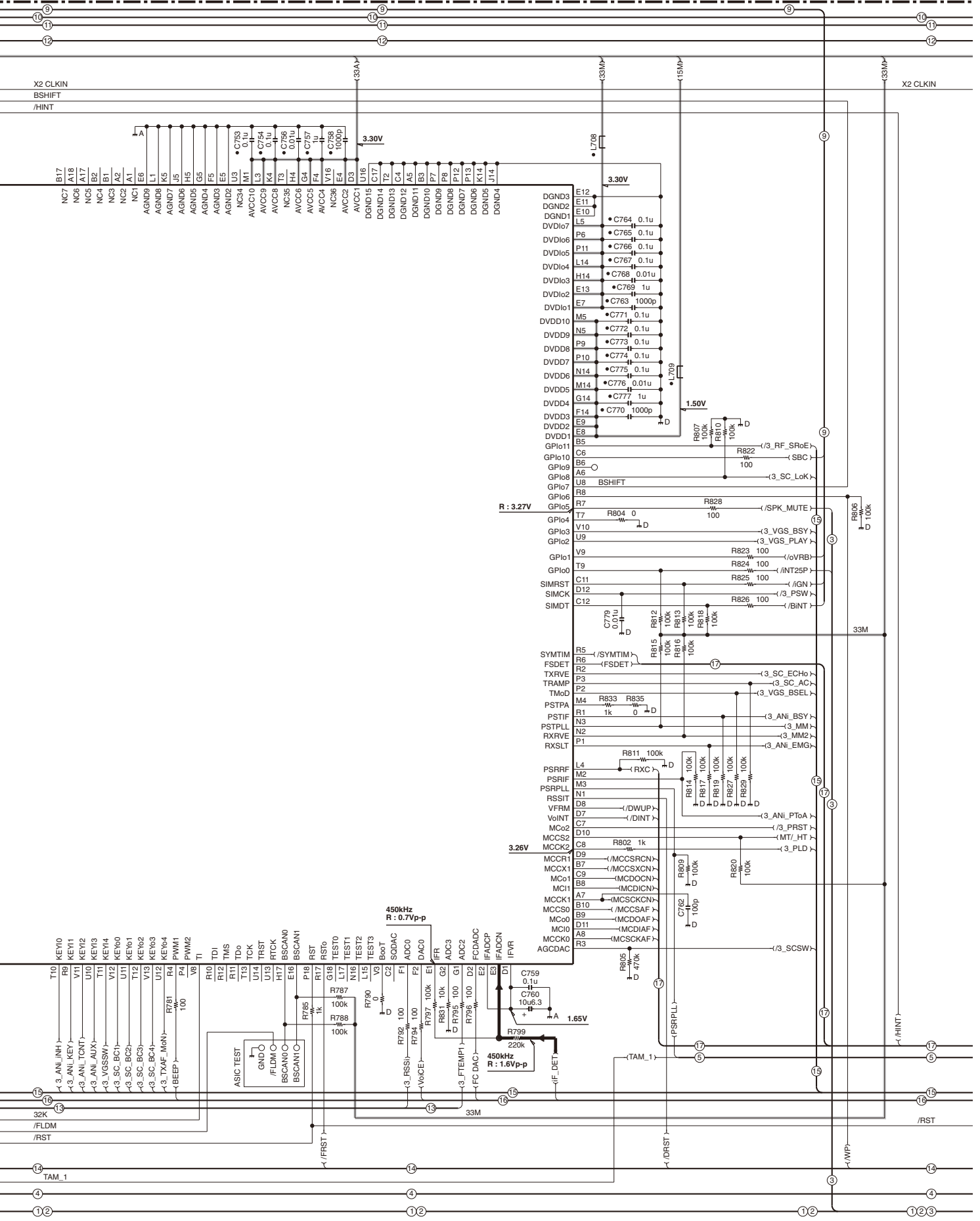
# SCHEMATIC DIAGRAM TK-5910(B)

CONTROL UNIT (X53-4400-10)



# TK-5910(B) SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4400-10)

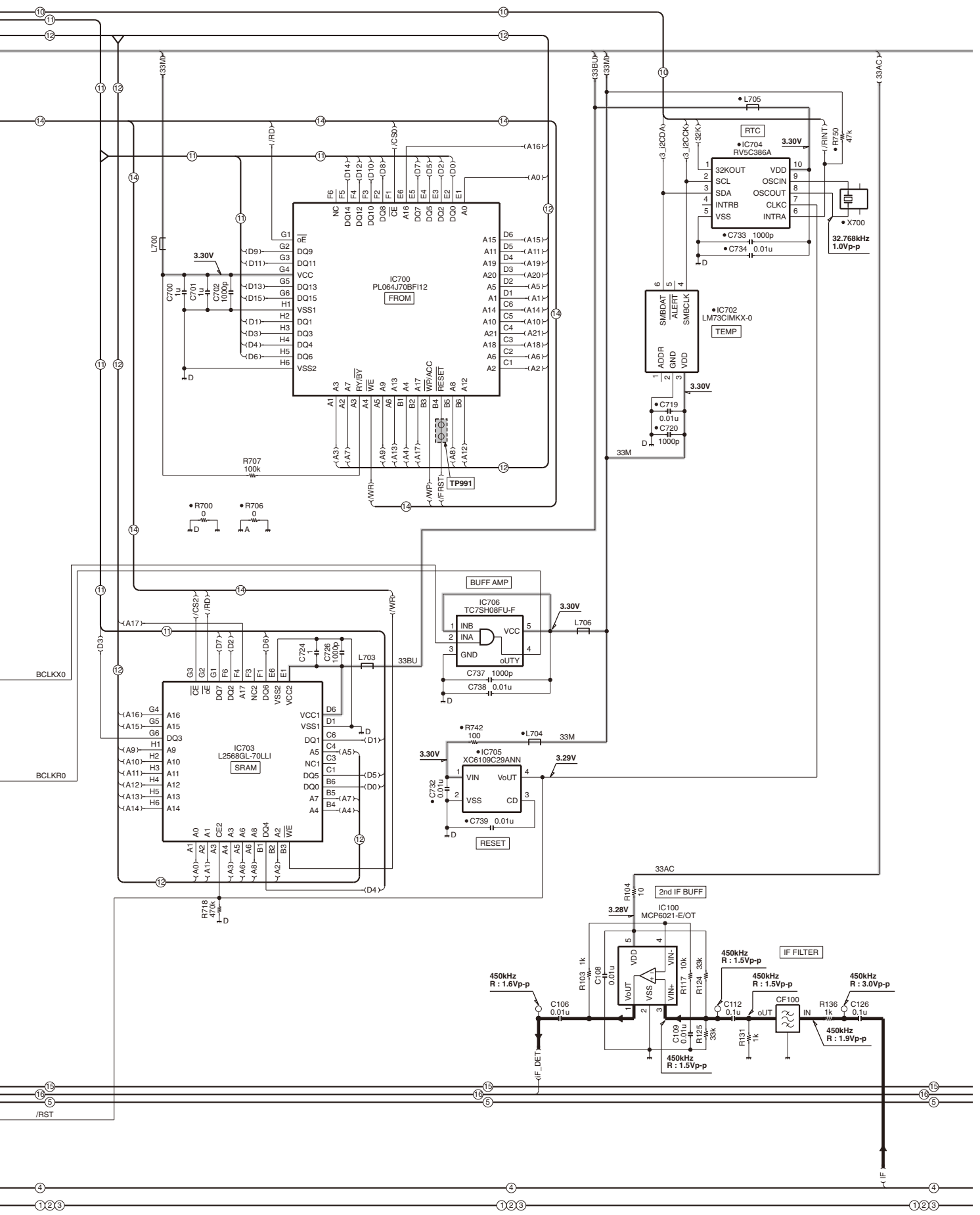






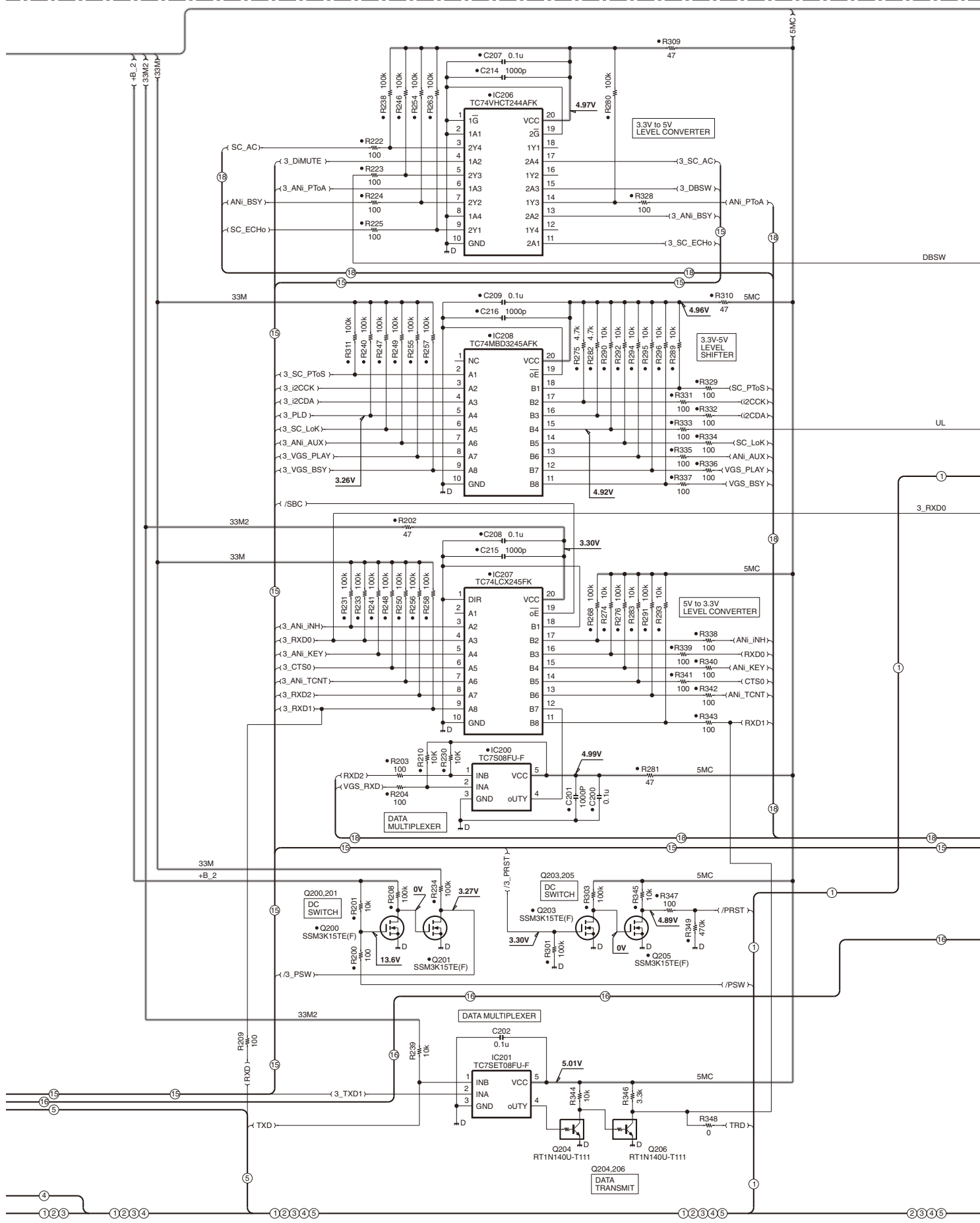
# TK-5910(B) SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4400-10)



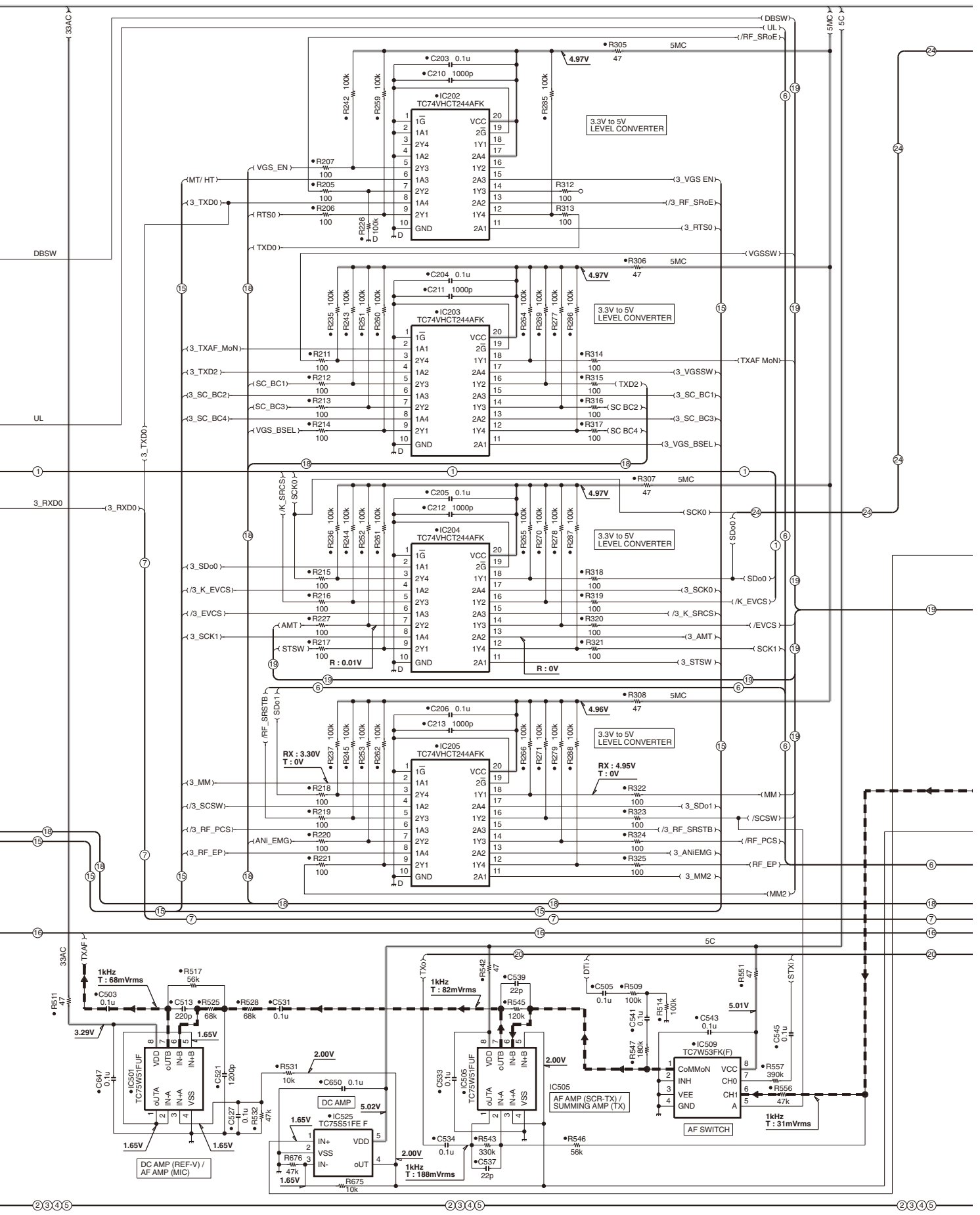
# SCHEMATIC DIAGRAM TK-5910(B)

CONTROL UNIT (X53-4400-10)



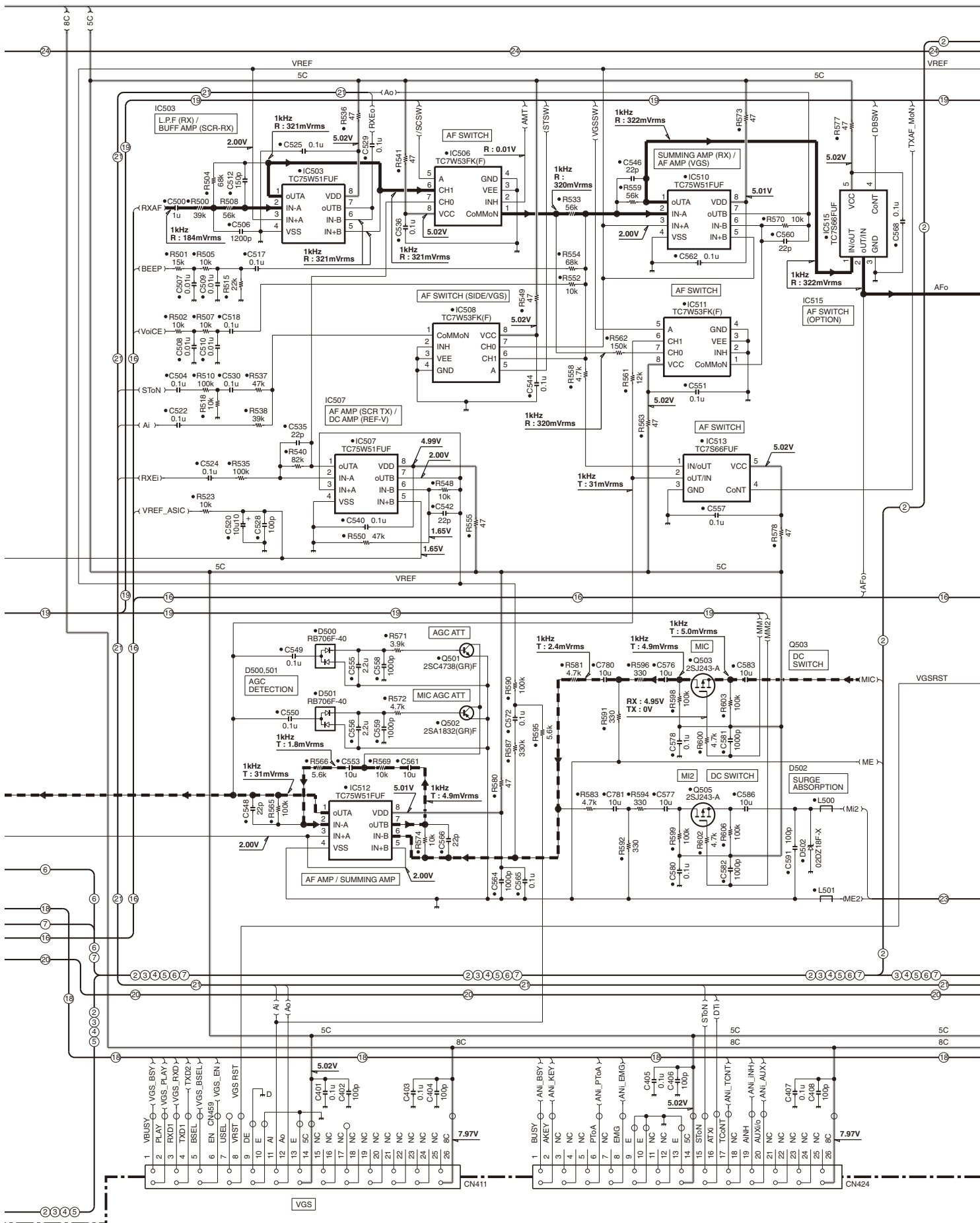
# TK-5910(B) SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4400-10)



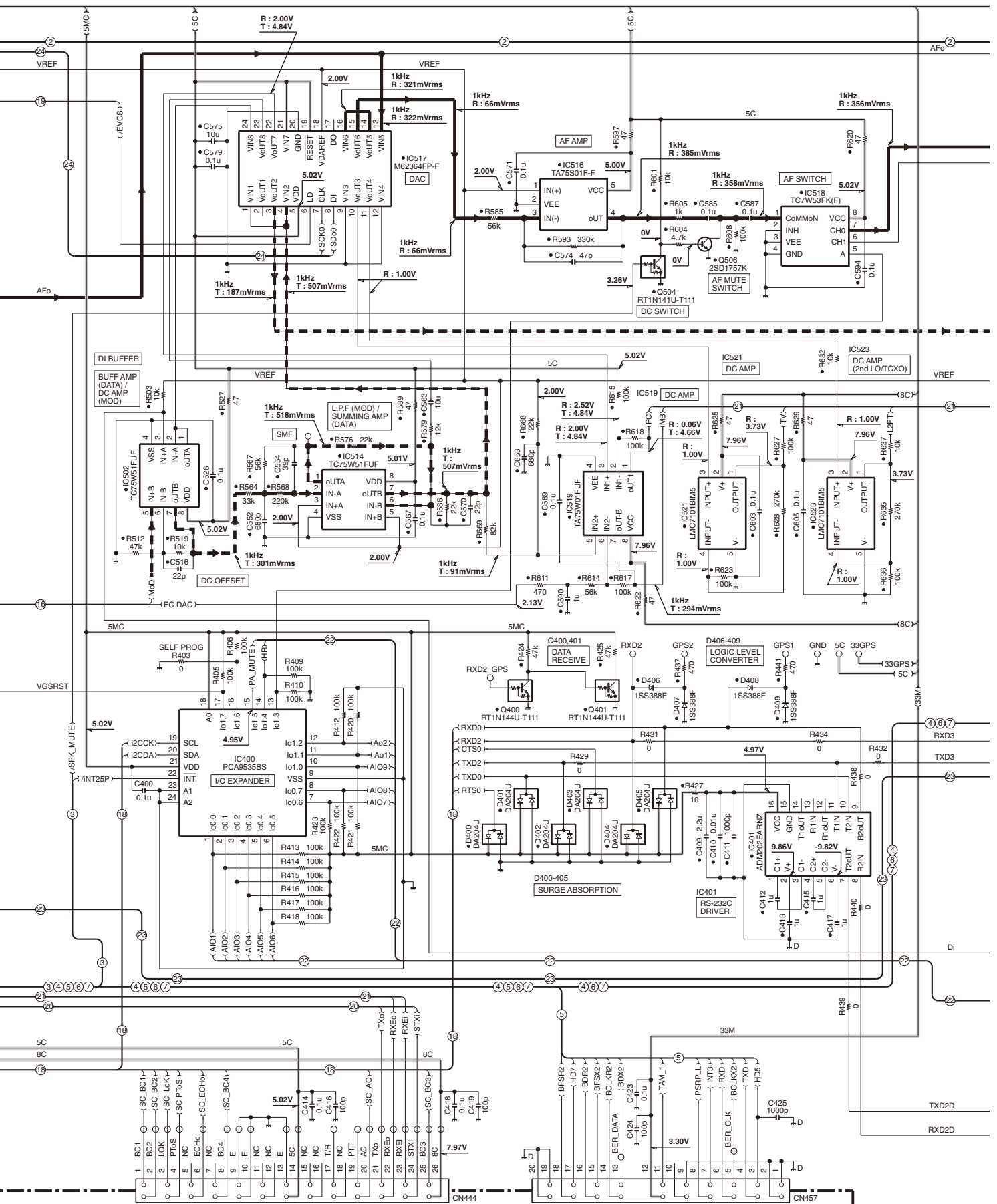
# SCHEMATIC DIAGRAM TK-5910(B)

CONTROL UNIT (X53-4400-10)



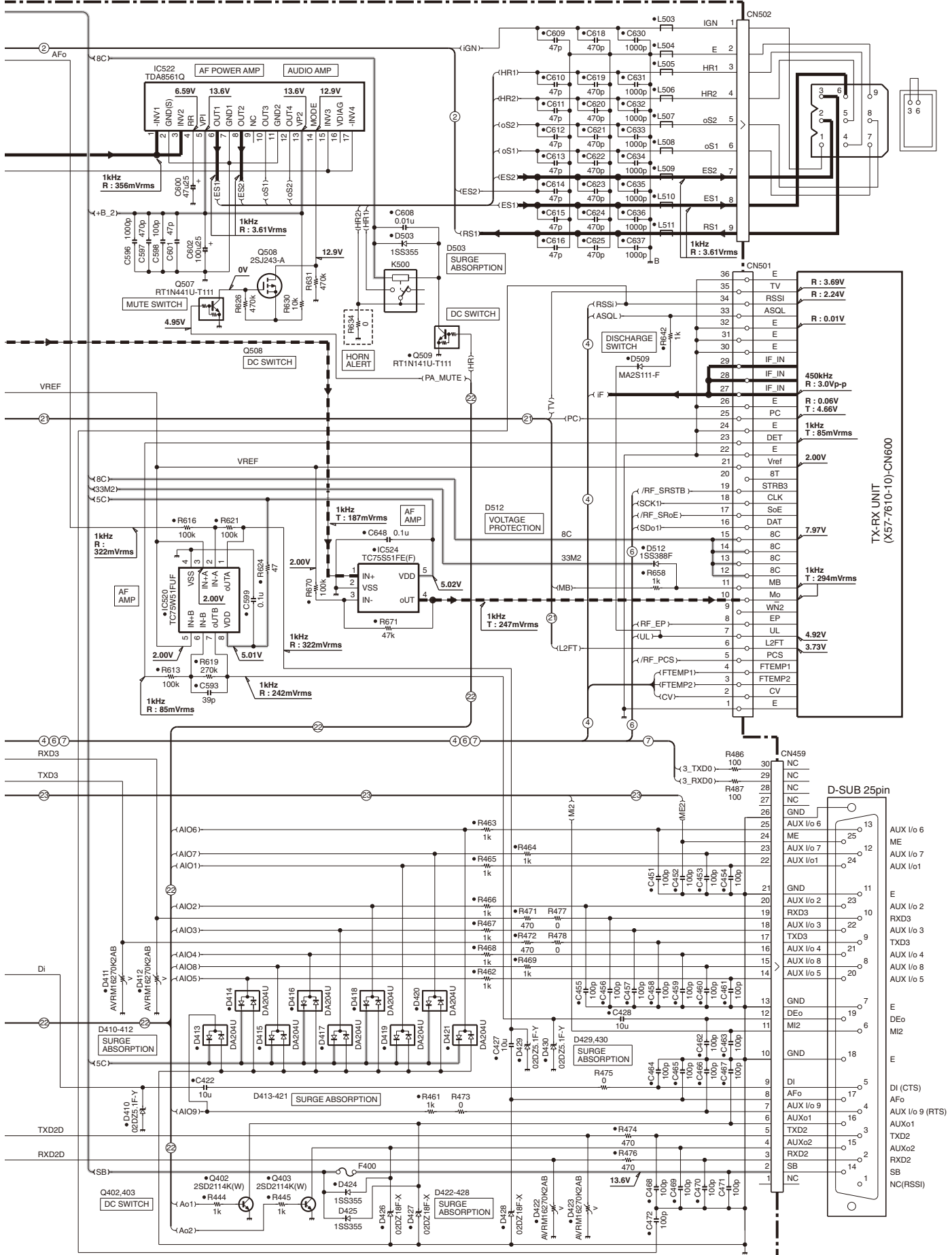
# TK-5910(B) SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4400-10)



# SCHEMATIC DIAGRAM TK-5910(B)

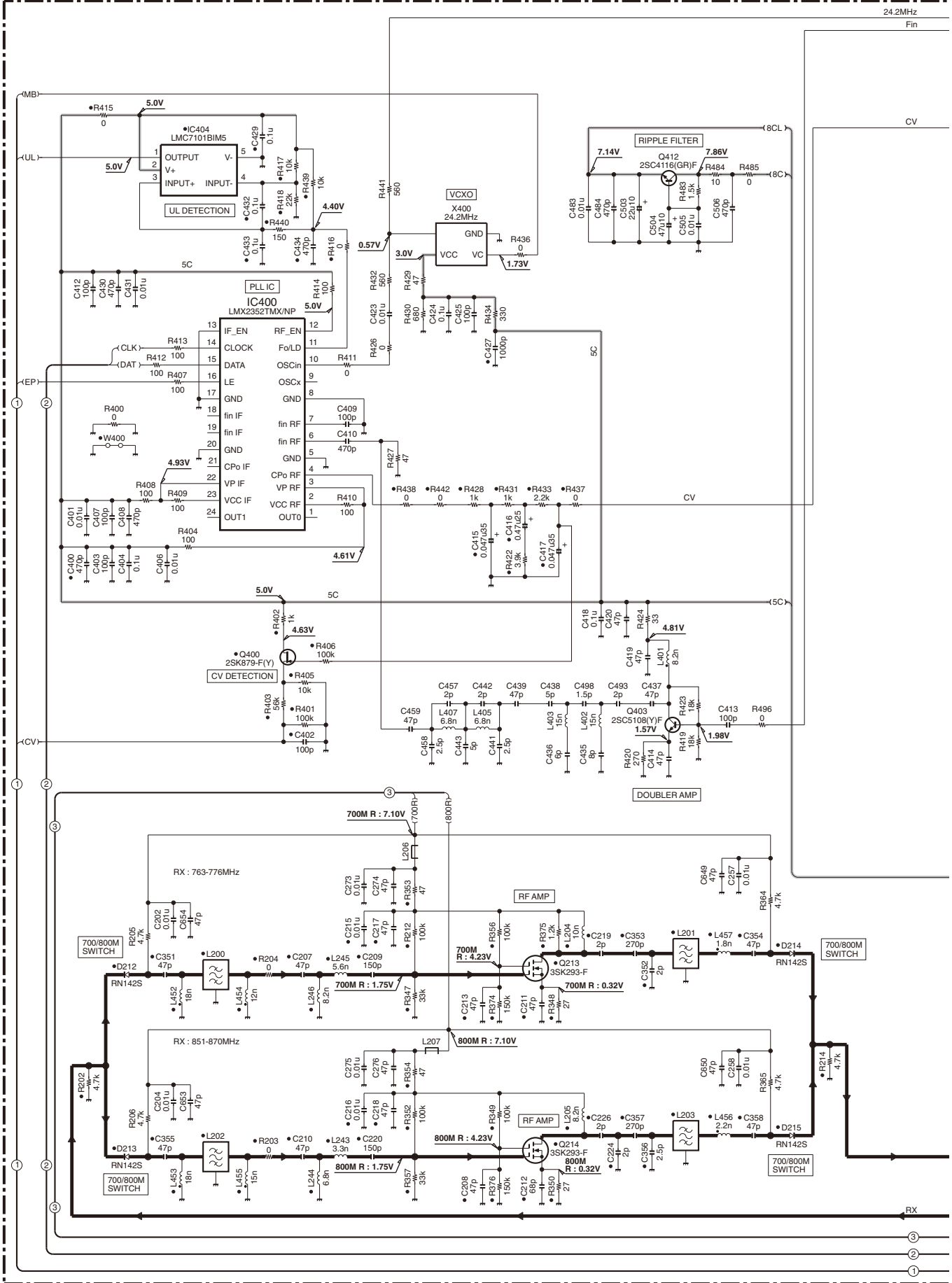
CONTROL UNIT (X53-440-10)



Note : The components for X53-440 marked with a dot (•) are parts of layer 6.

# TK-5910(B) SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7610-10)





# SCHEMATIC DIAGRAM TK-5910(B)

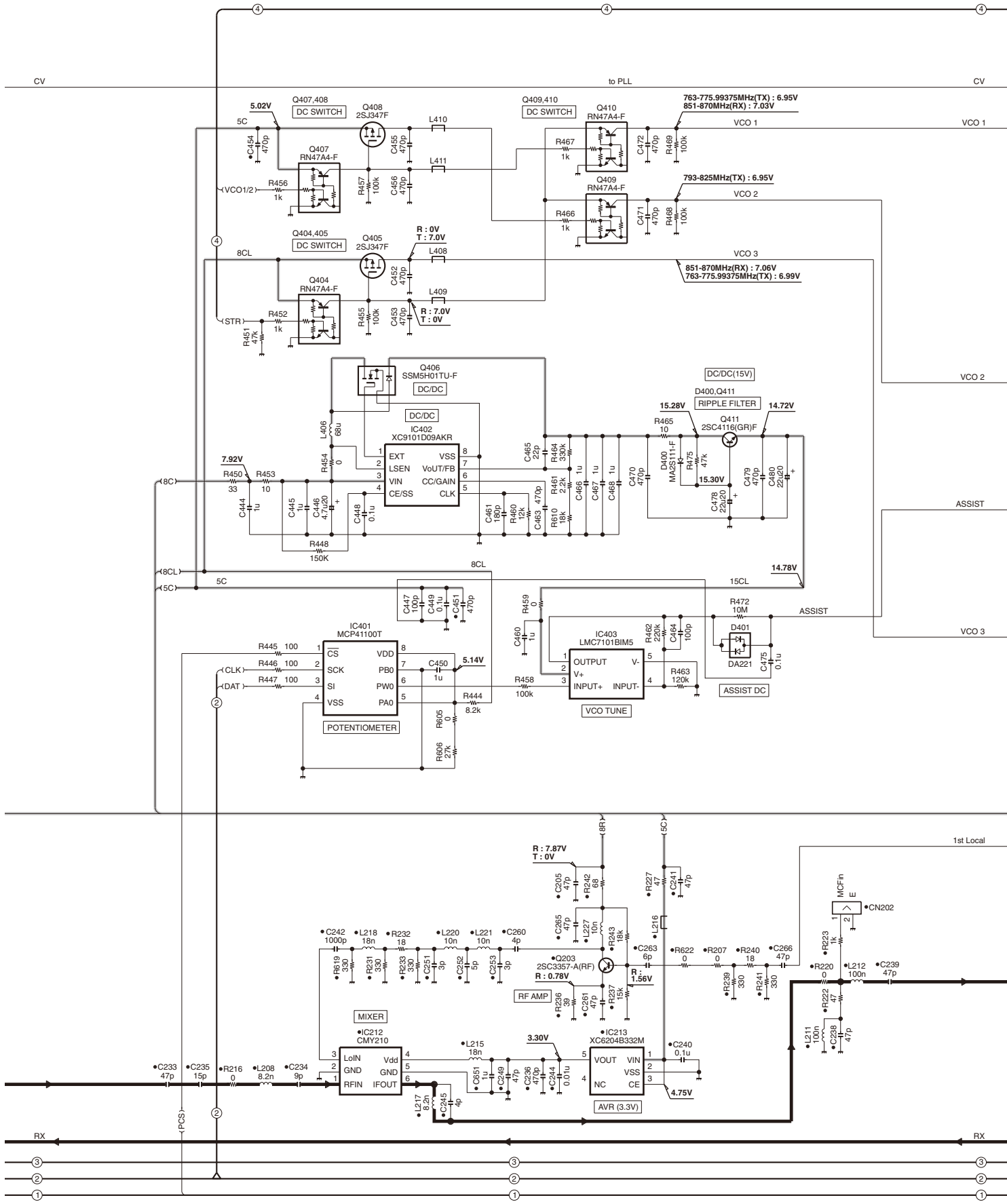
TX-RX UNIT (X57-7610-10)

24.2MHz

24.2MHz

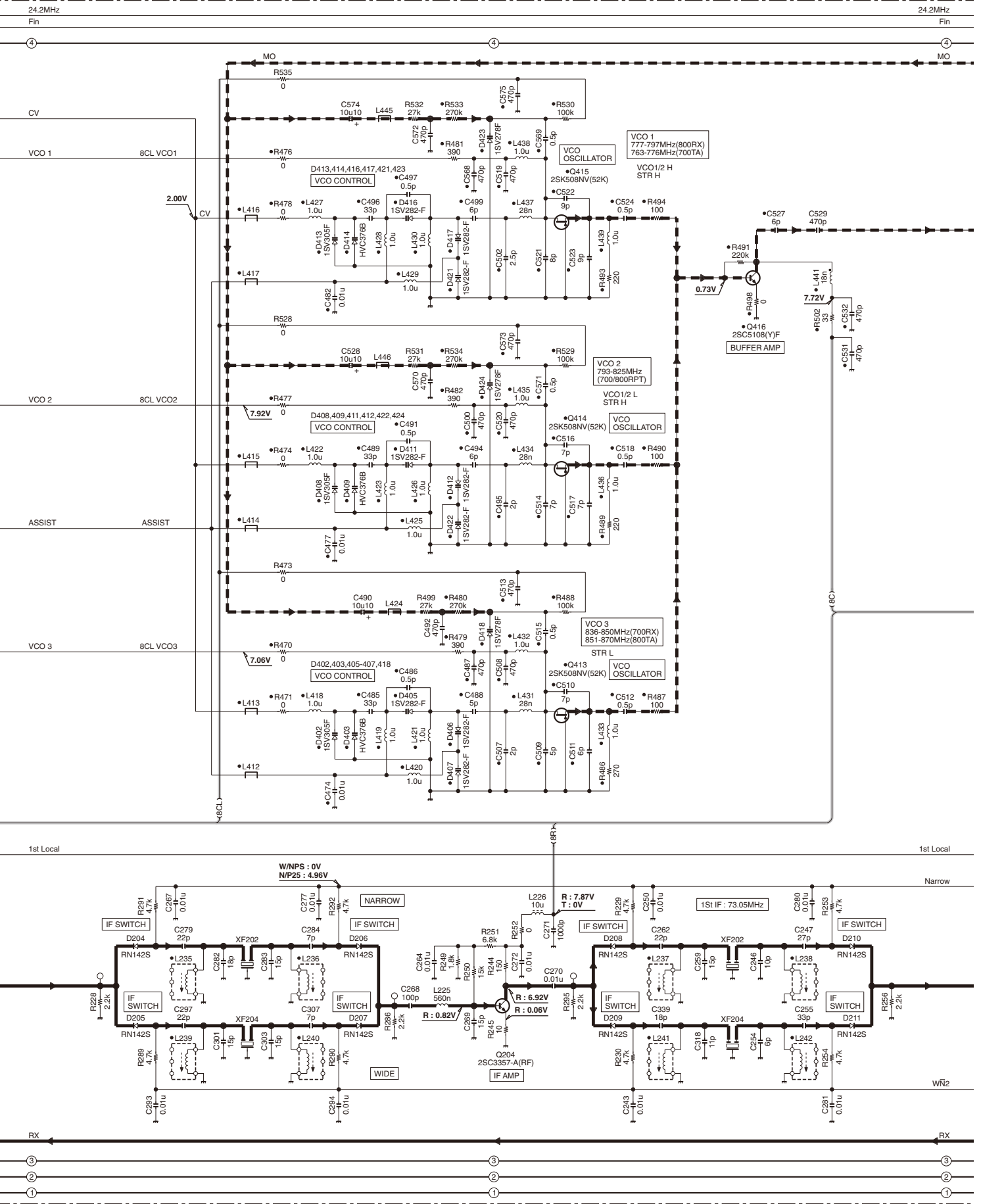
Fin

Fin



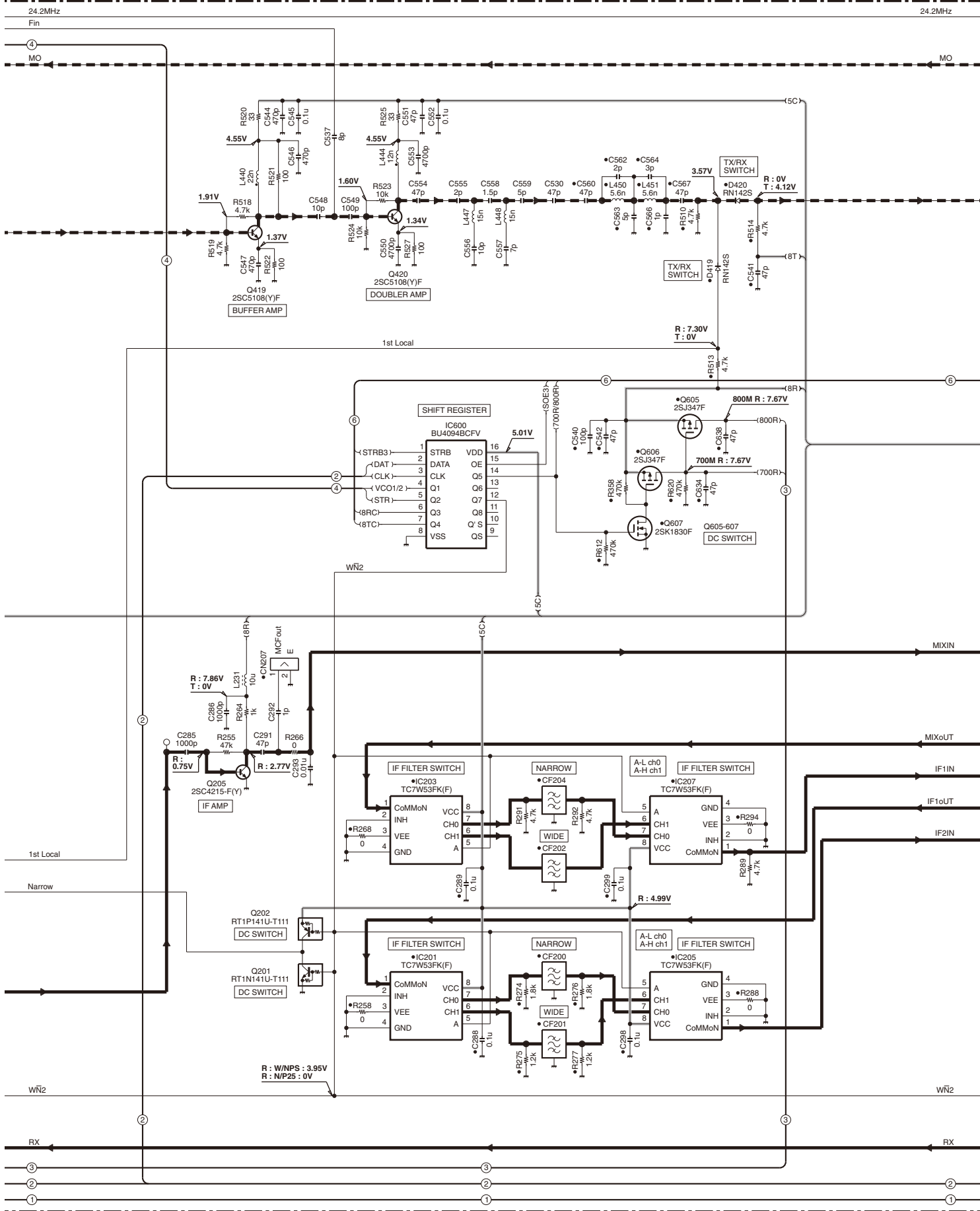
# TK-5910(B) SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7610-10)



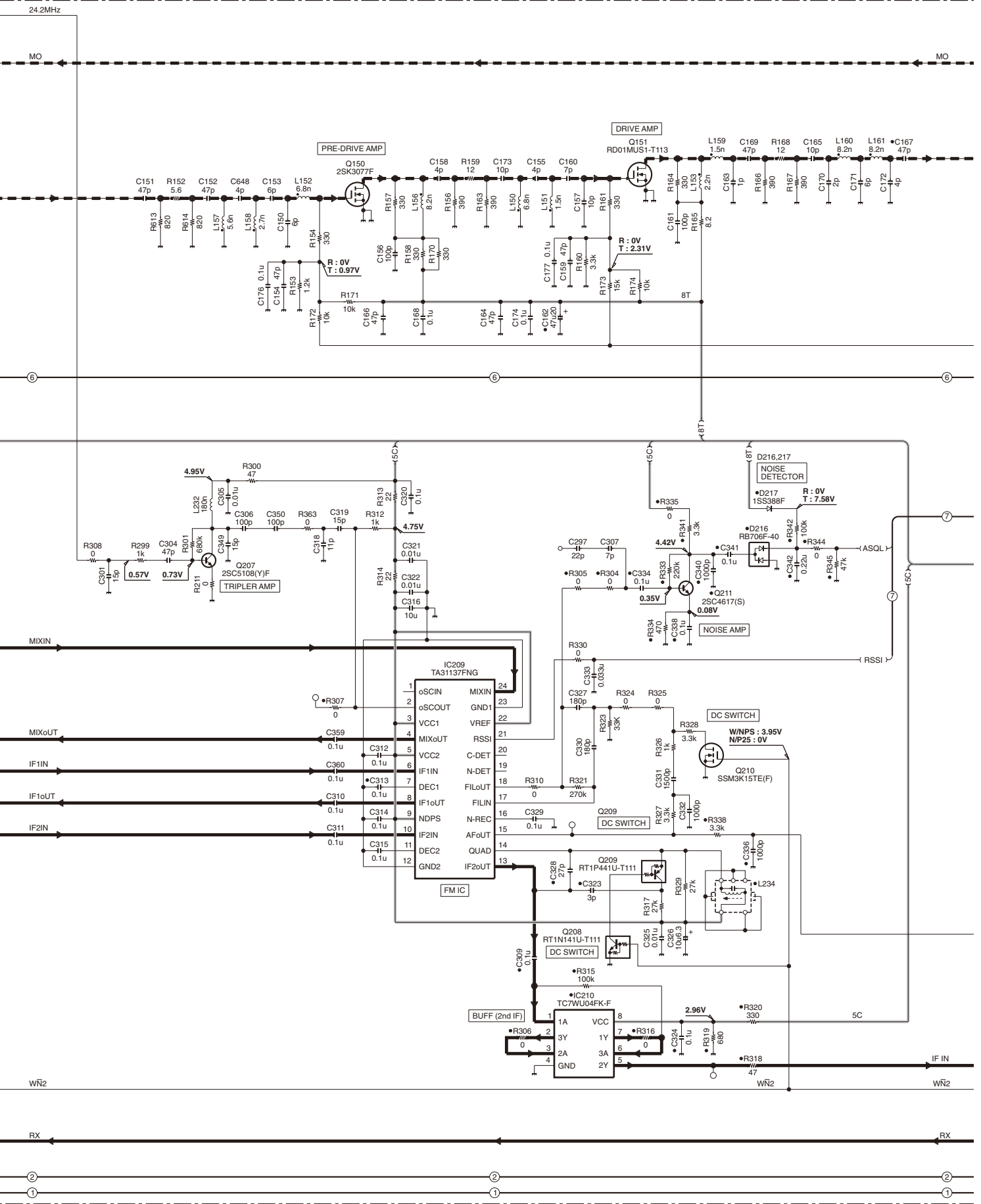
# SCHEMATIC DIAGRAM TK-5910(B)

TX-RX UNIT (X57-7610-10)



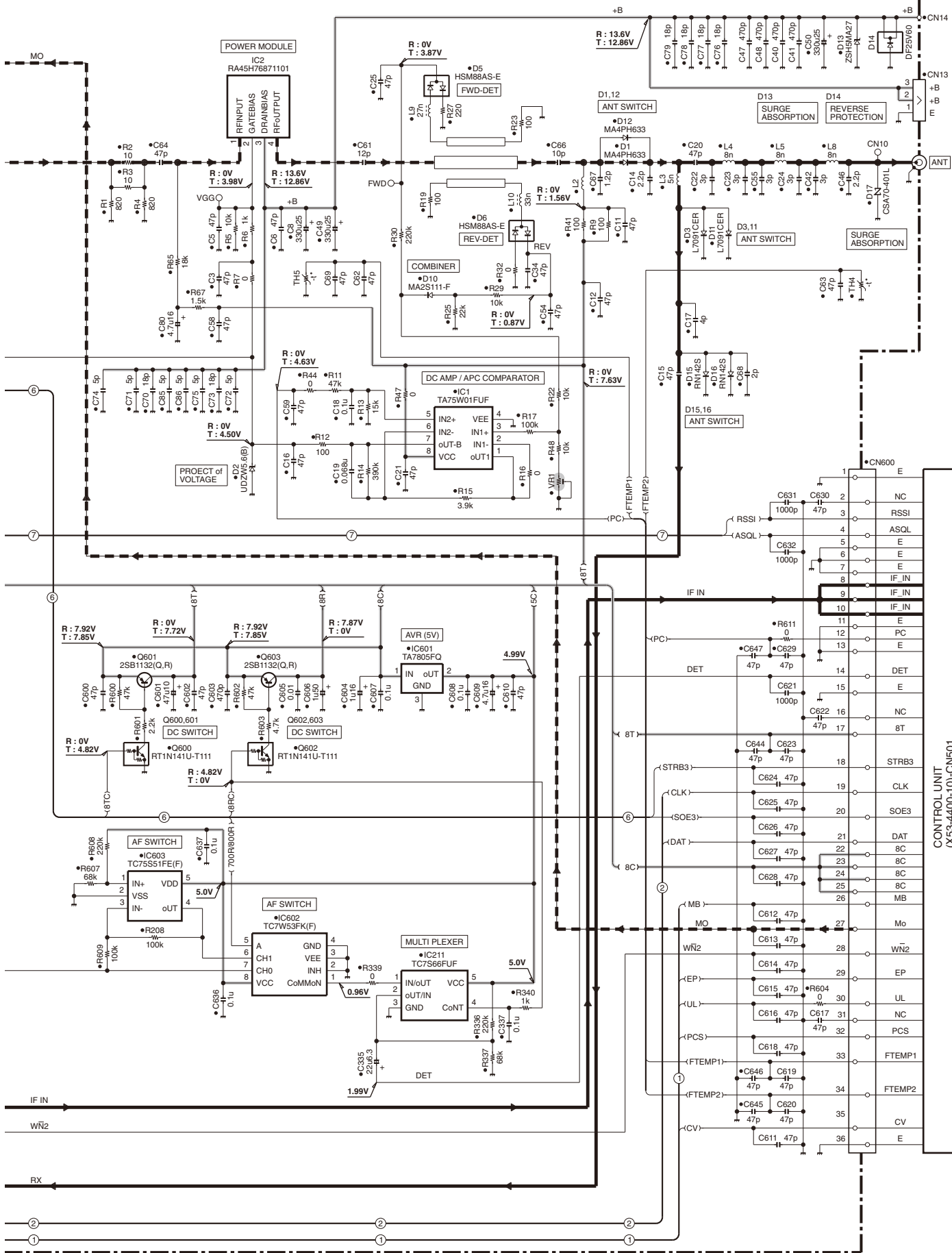
# TK-5910(B) SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7610-10)



# SCHEMATIC DIAGRAM TK-5910(B)

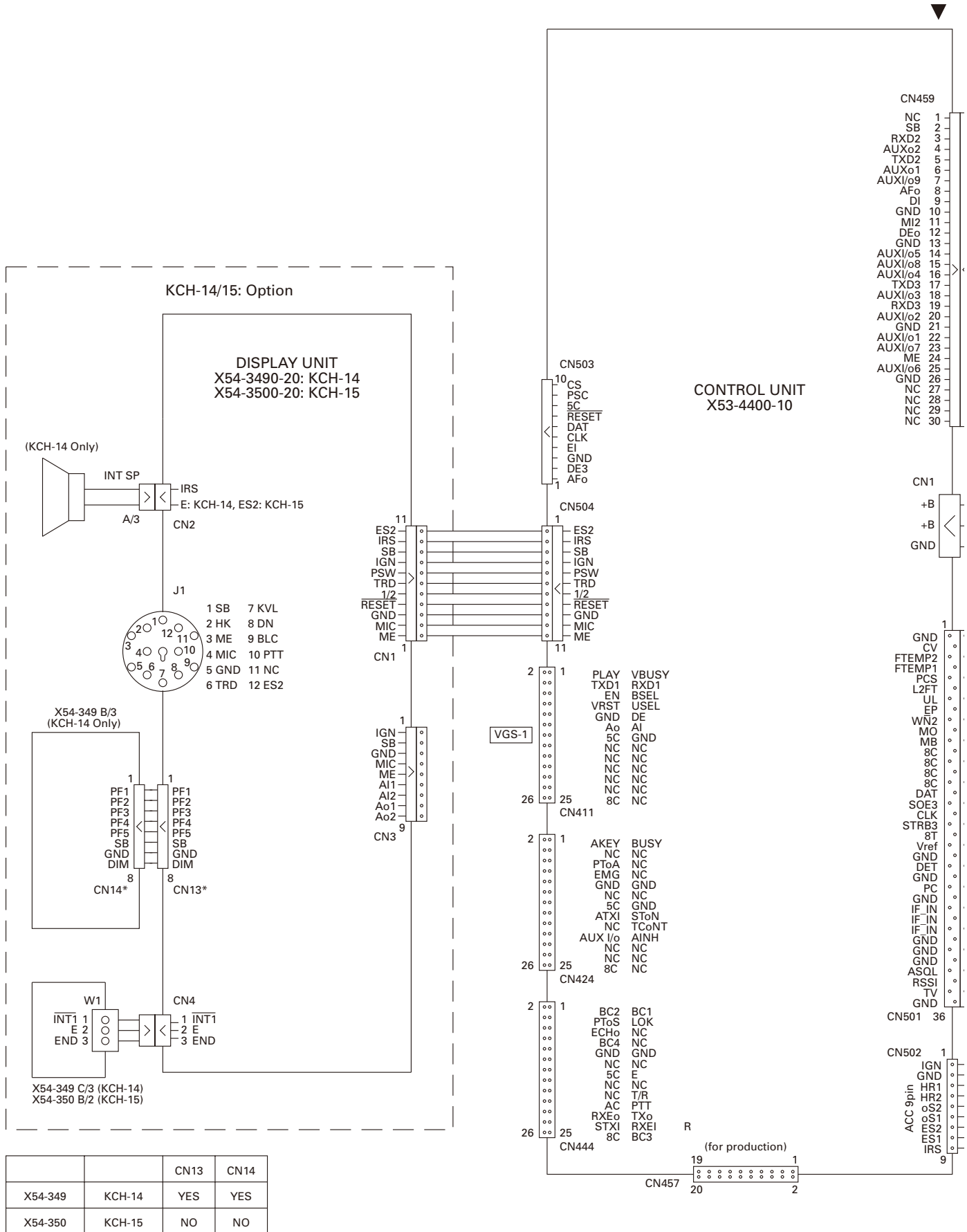
TX-RX UNIT (X57-7610-10)



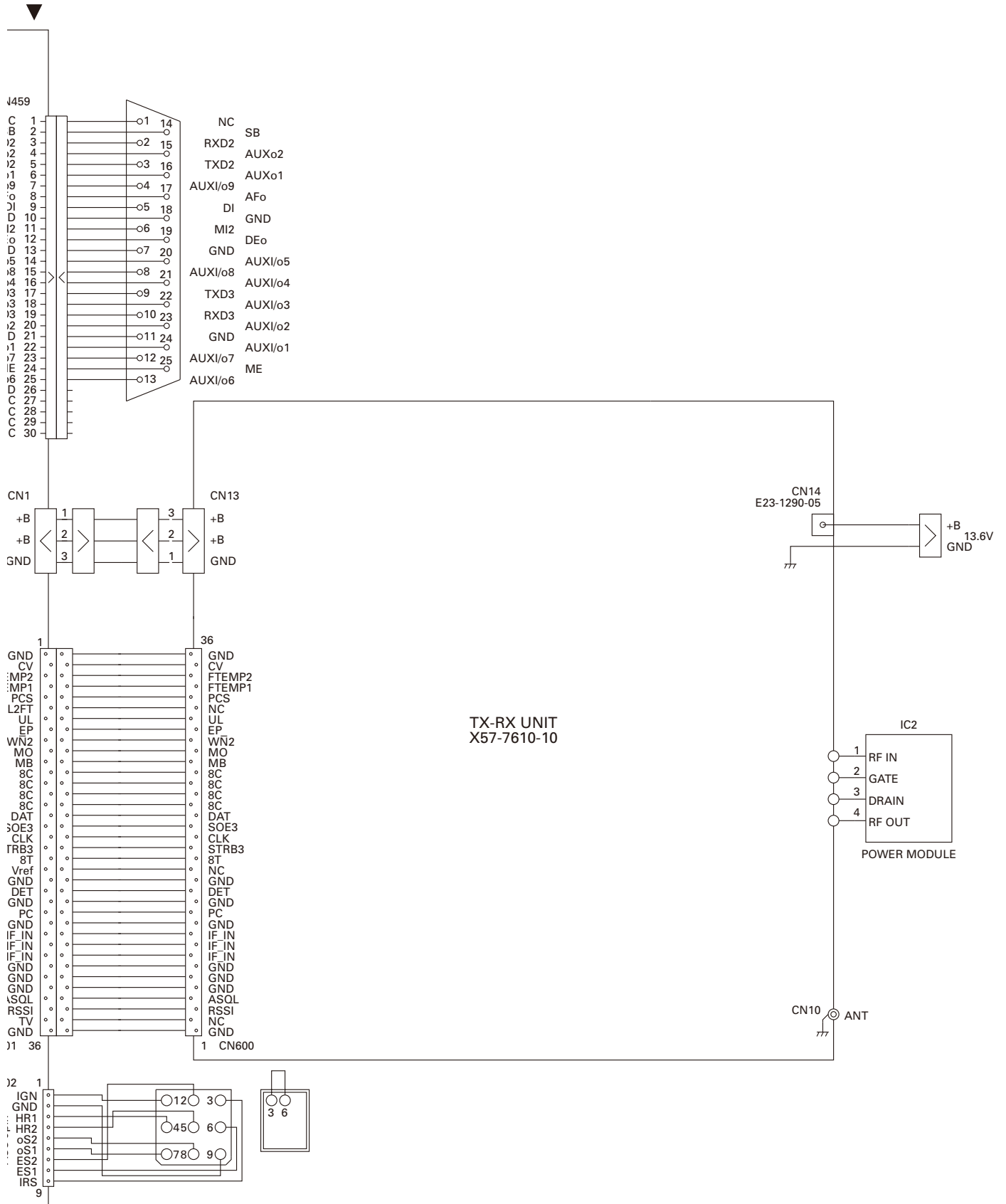
Note : The components marked with a dot (•) are parts of layer 1.

# TK-5910(B)

## INTERCONNECTION DIAGRAM

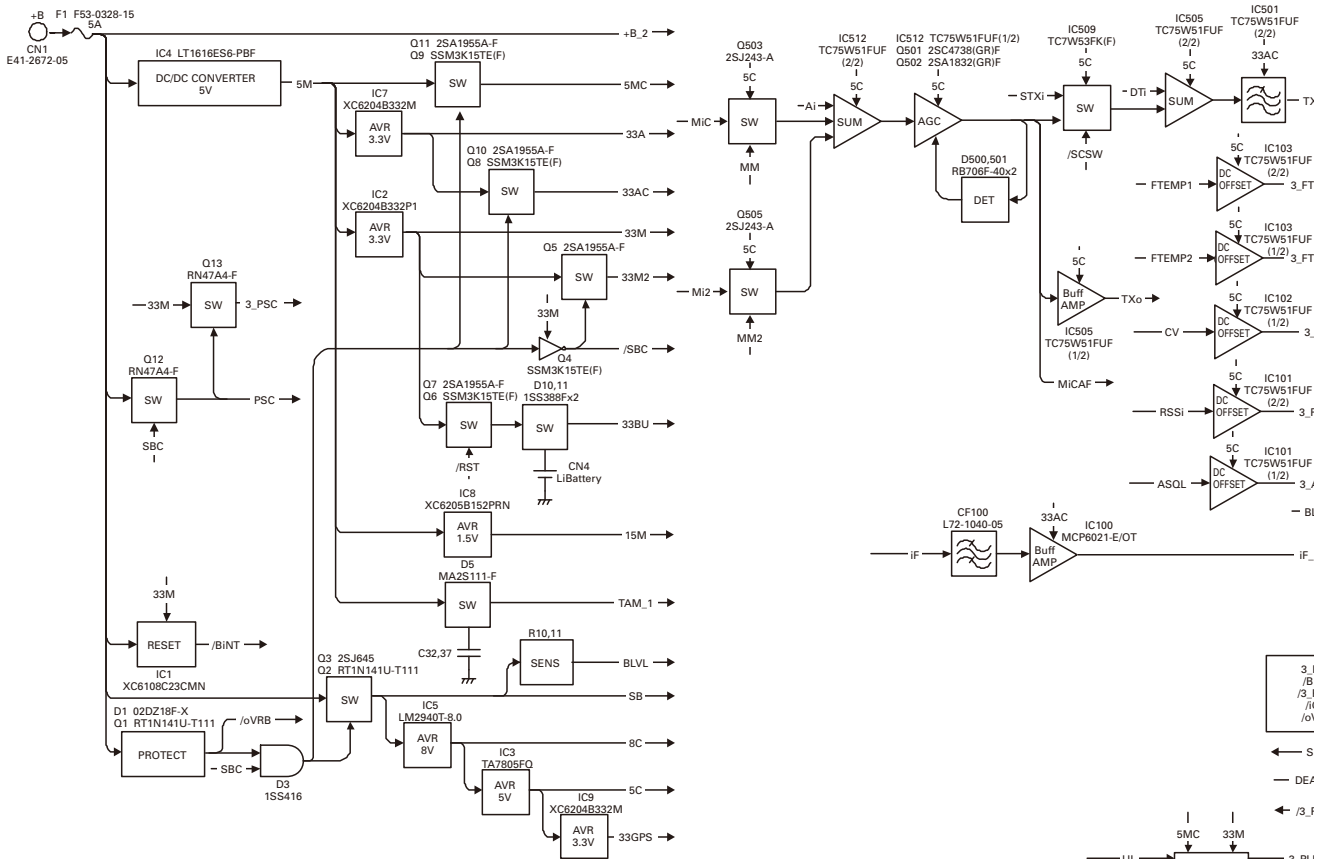


## INTERCONNECTION DIAGRAM



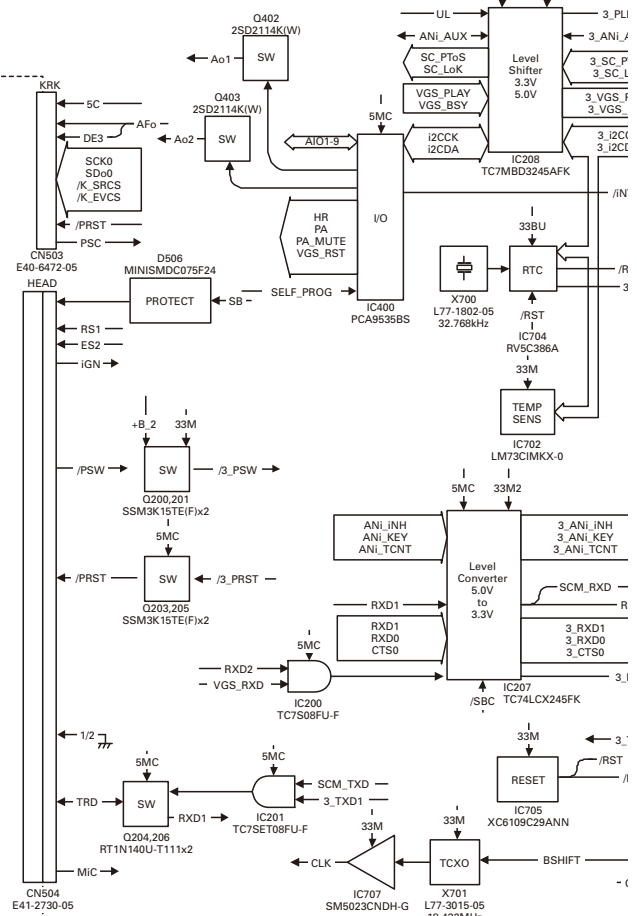
## BLOCK DIAGRAM

### Control unit (X53-4400-10)



(option)

- Display Unit
- Front Panel Kit KCH-14
- Front Panel Kit KCH-15
- Handheld Control Head KCH-16



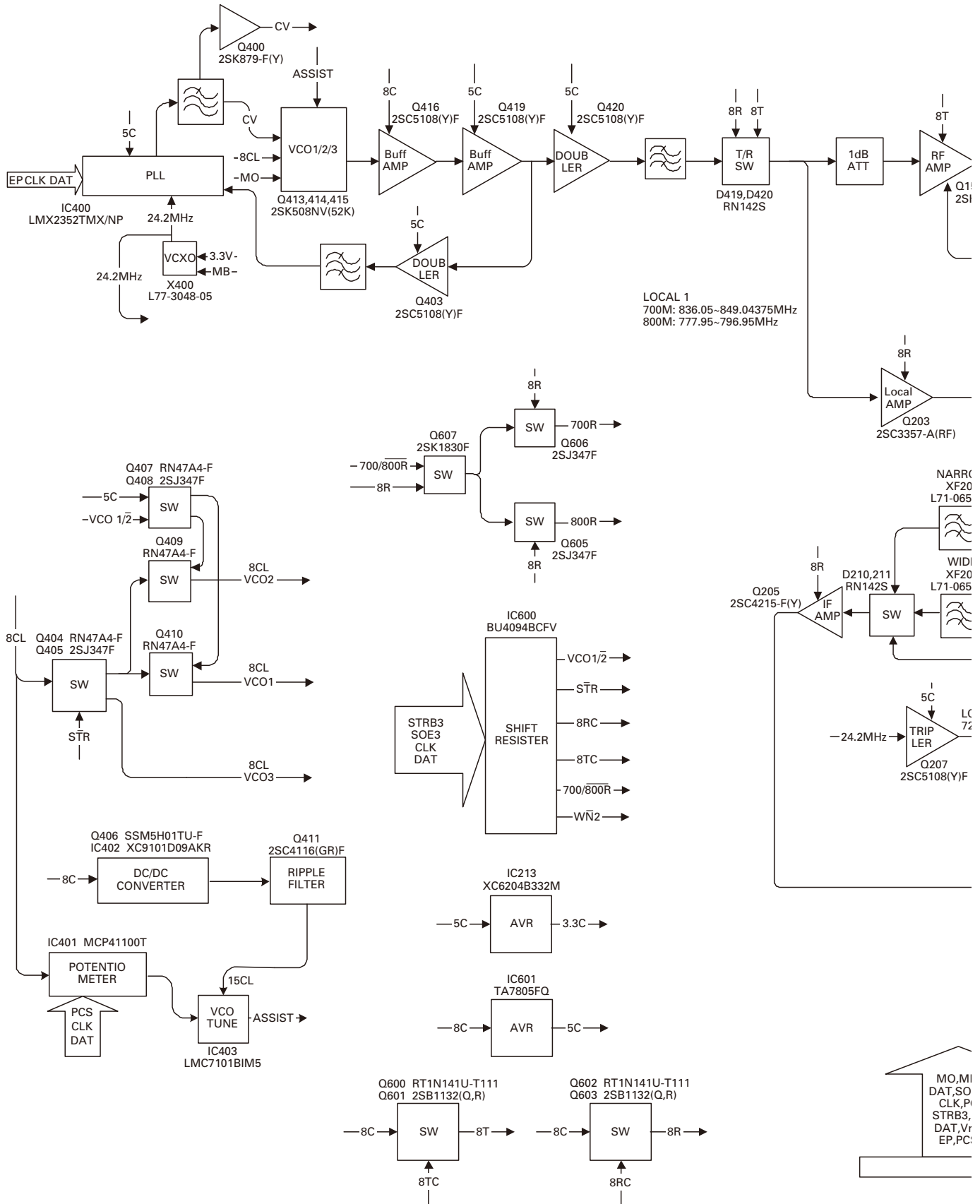




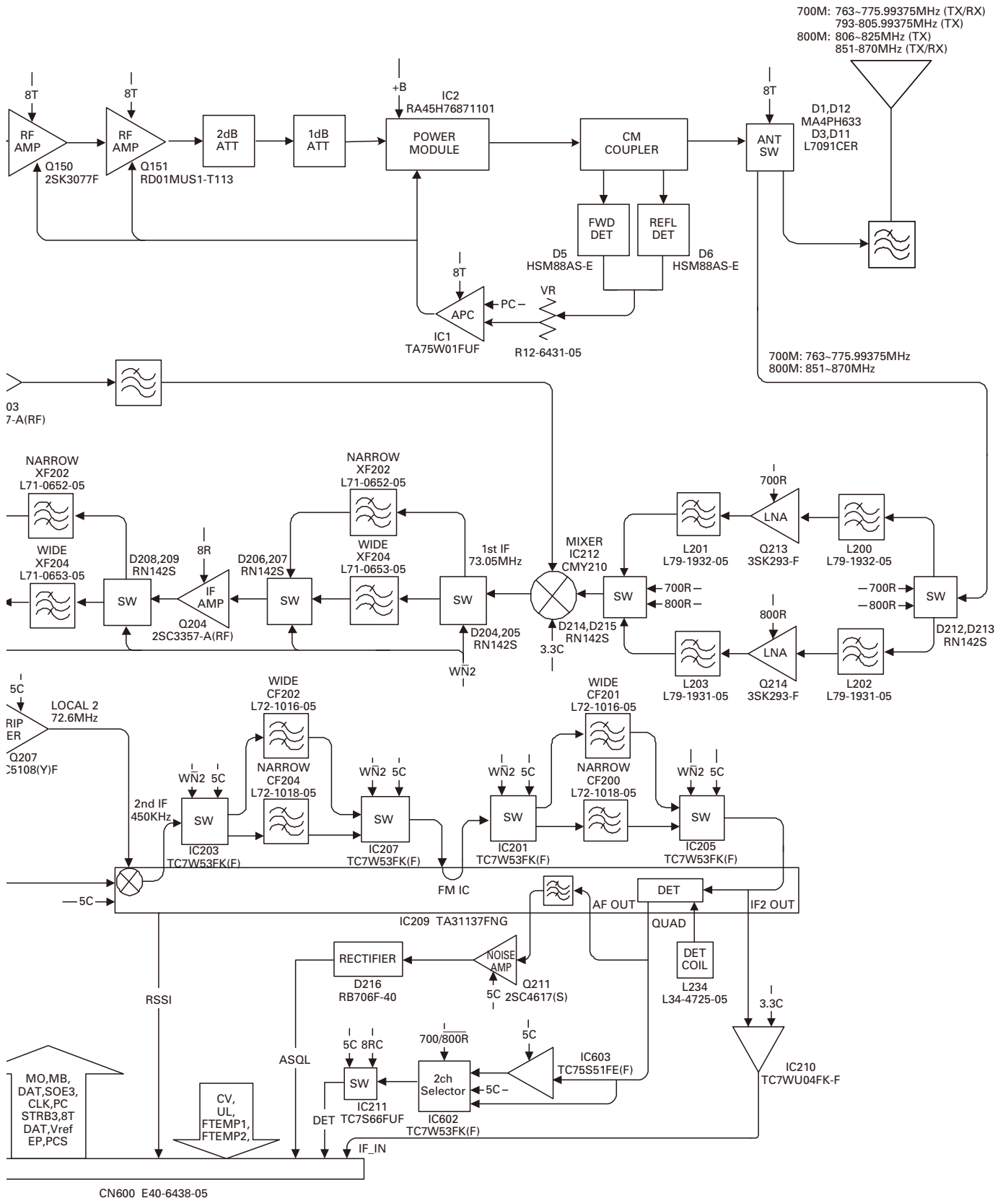
# TK-5910(B)

## BLOCK DIAGRAM

### TX-RX unit (X57-7610-10)

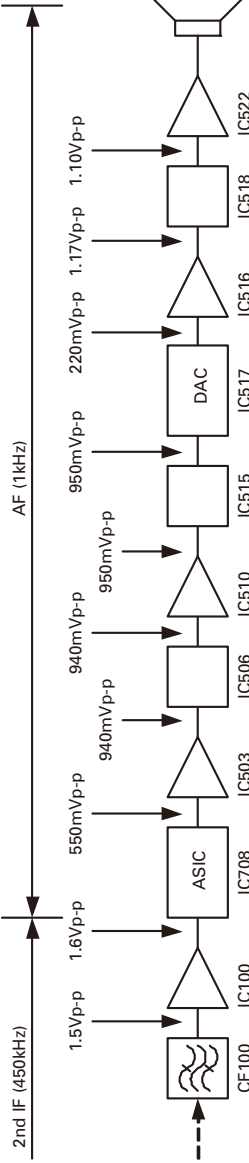
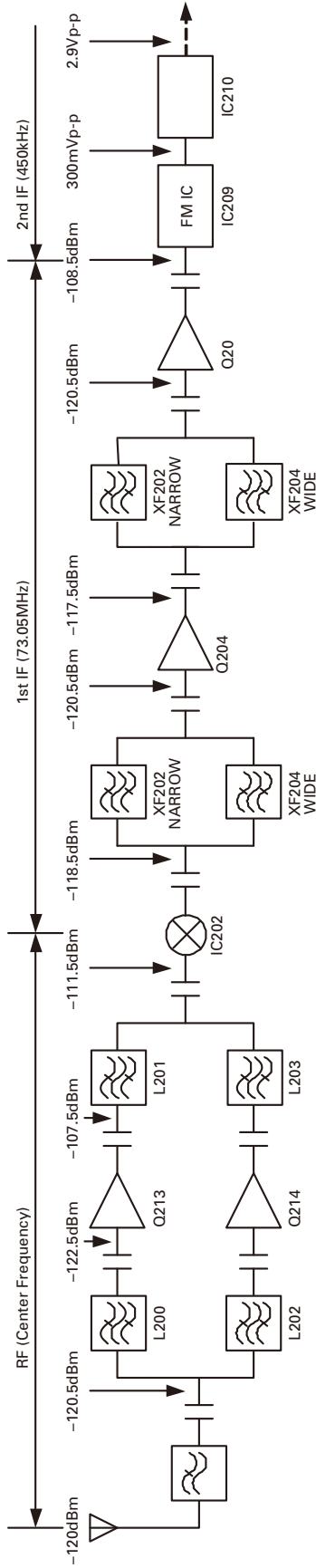


## BLOCK DIAGRAM



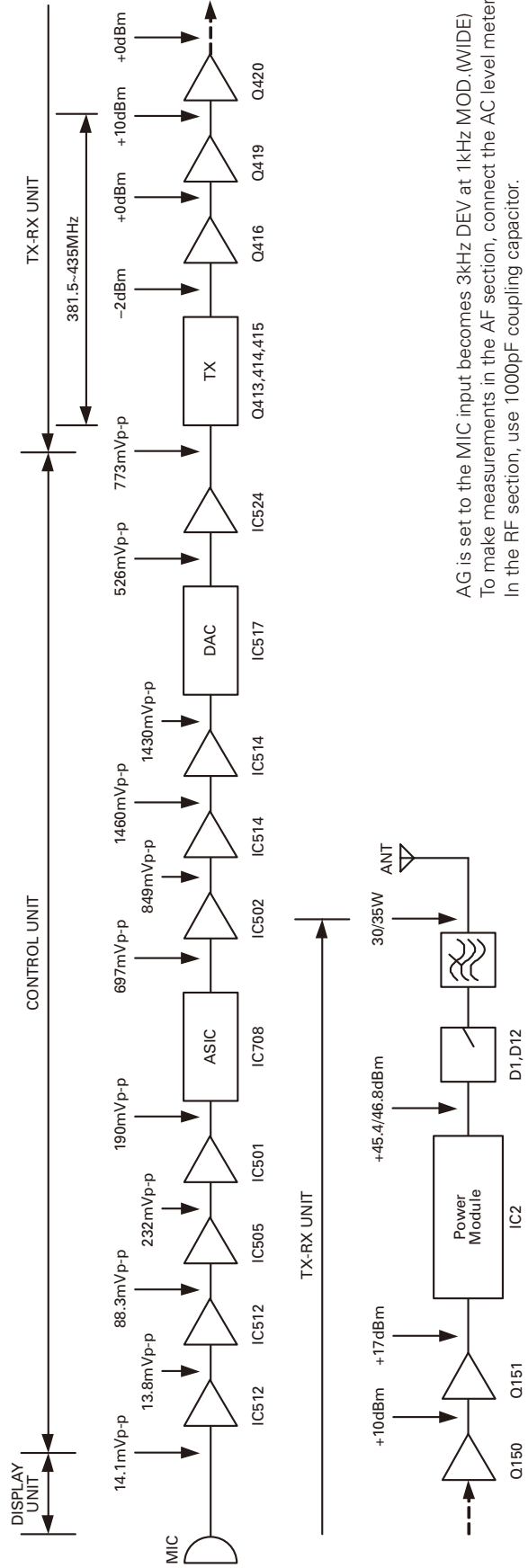
## LEVEL DIAGRAM

### Receiver Section



To make measurements in the AF section, connect the AC level meter. (ANT input: -53dBm, 1kHz FM, 3kHz DEV (WIDE).) In the RF section, use 470pF coupling capacitor. (The display shows the SSG input value required to obtain 12dB SINAD without local level.)

### Transmitter Section



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

## SPECIFICATIONS

### GENERAL

Frequency Range .....	700M: 763~775.99375 MHz (TX-RX)	793~805.99375 MHz (TX)
	800M: 851~870 MHz (TX-RX)	806~825 MHz (TX)
Number of Channels .....	1024	
Zones .....	100	
Max. Channels per Zone.....	512	
Channel Spacing .....	Analog: 12.5/25 kHz	Digital: 12.5 kHz
Operating Voltage .....	13.6V DC $\pm$ 15%	
Current Drain		
Standby .....	Less than 0.45A	
Receive.....	Less than 2.3A	
Transmit.....	13A	
Duty Cycle .....	Transmit: 20%	
Operating Temperature Range .....	-22°F to +140°F (-30°C to +60°C)	
Frequency Stability .....	$\pm$ 1.5 ppm -22°F to +140°F (-30°C to +60°C)	
Antenna Impedance .....	50 $\Omega$	
Dimensions (W x H x D)		
(Projections included)		
RF Deck only .....	7.01" x 2.36" x 10.3" in. (178 x 60 x 261 mm)	
with KCH-14 or KCH-15.....	7.05" x 2.36" x 11.7" in. (179 x 60 x 296 mm)	
Weight (net)		
RF Deck only .....	6.6 lbs. (3.0kg)	
with KCH-14 .....	7.3 lbs. (3.3kg)	
with KCH-15 .....	7.3 lbs. (3.3kg)	

### RECEIVER

Sensitivity .....	Digital (5% BER): 0.25 $\mu$ V	Digital (1% BER): 0.40 $\mu$ V
	Analog 12dB SINAD: 0.25 $\mu$ V	
Selectivity .....	Digital: -63dB	Analog @25kHz: -80dB    Analog @12.5kHz: -70dB
Intermodulation Distortion .....	Digital: -80dB	Analog @25kHz: -80dB    Analog @12.5kHz: -80dB
Spurious and Image .....	Digital: -85dB	Analog: -85dB
Audio Distortion.....	Digital: Less than 1.0%	Analog: Less than 2.0%
Audio Output .....	Internal (KCH-14) @3%: 1.5W/8 $\Omega$	External: @3%: 12W/4 $\Omega$
	Internal (KCH-14) @5%: 1.625W/8 $\Omega$	External: @5%: 13W/4 $\Omega$

### TRANSMITTER

RF Output Power.....	30W to 2W (700M), 35W to 2W (800M)	
Spurious and Harmonics .....	80dB	
FM Hum and Noise .....	Analog @25kHz: 45dB	Analog @12.5kHz: 40dB
Microphone Impedance.....	600 $\Omega$	
Audio Distortion .....	Less than 2%	
Modulation .....	16K0F3E, 11K0F3E, 8K10F1E, 8K10F1D, 14K0F3E	

Analog measurements made per TIA/EIA-603

Digital measurements made per TIA/EIA-102CAAA

KENWOOD reserves the right to change specifications without prior notice or obligation.

# TK-5910(B)

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### Kenwood Ibérica, S.A.

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Kwai Fong, N.T., Hong Kong

### Kenwood Electronics Singapore Pte Ltd

1 Ang Mo Kio Street 63, Singapore 569110

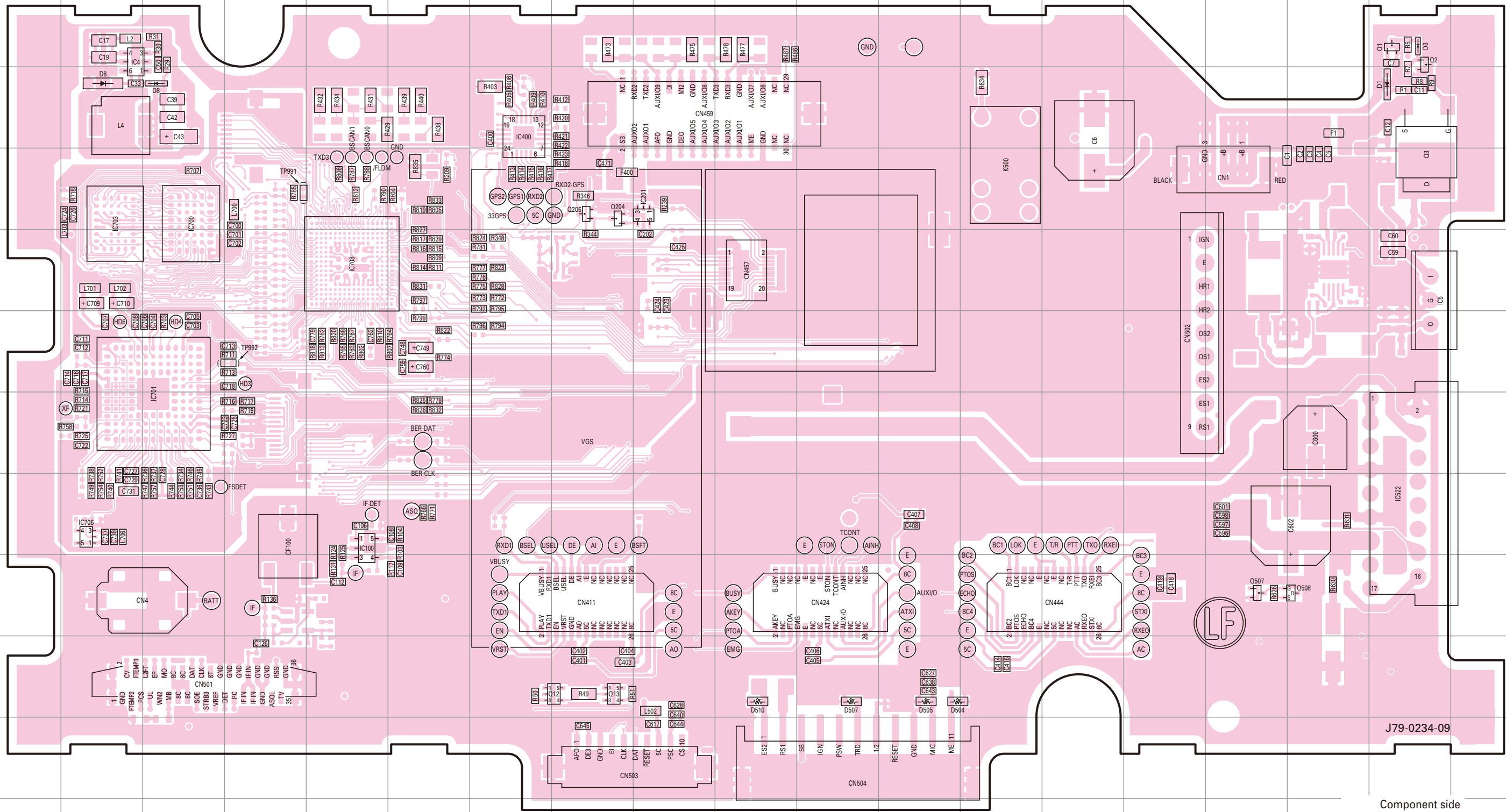


# TK-5910(B) PC BOARD

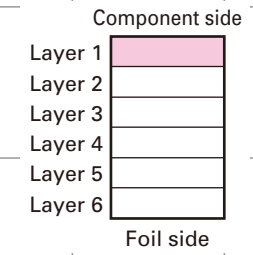
# PC BOARD TK-5910(B)

CONTROL UNIT (X53-4400-10) Component side view (J79-0234-09)

CONTROL UNIT (X53-4400-10) Component side view (J79-0234-09)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC4	2B	IC700	4C	Q2	2R	Q507	9P	D504	10L
IC5	5R	IC701	7C	Q3	4R	Q508	9Q	D505	10L
IC100	8E	IC703	4B	Q12	10H	D1	3R	D507	10K
IC201	4I	IC706	8B	Q13	10H	D3	2R	D510	10J
IC400	3G	IC708	5E	Q204	4H	D6	3B		
IC522	8R	Q1	2R	Q206	4H	D8	3C		

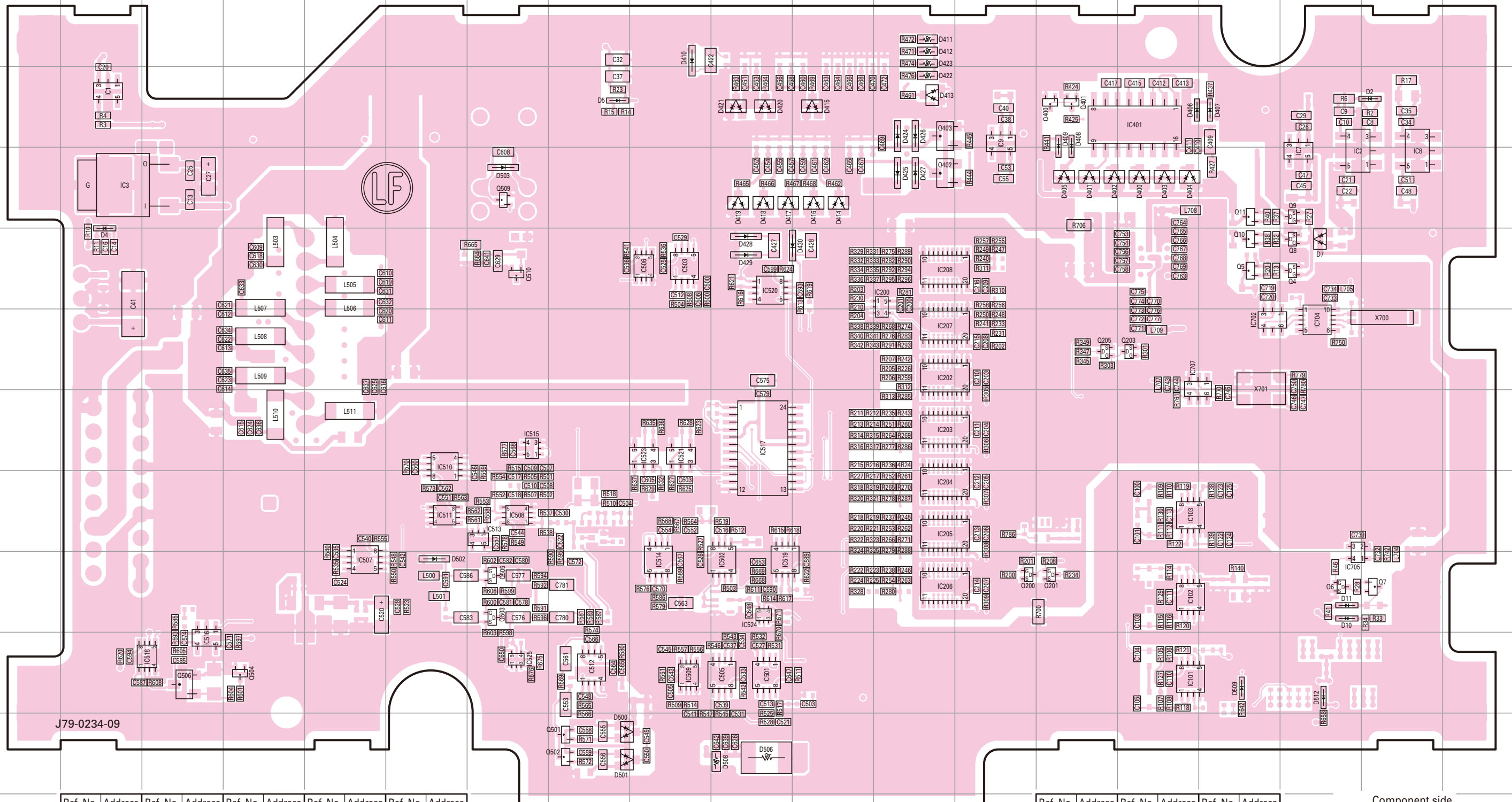


# TK-5910(B) PC BOARD

# PC BOARD TK-5910(B)

CONTROL UNIT (X53-4400-10) Foil side view (J79-0234-09)

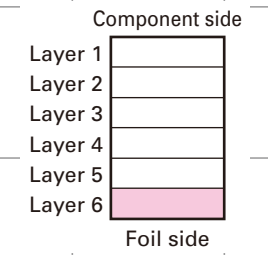
CONTROL UNIT (X53-4400-10) Foil side view (J79-0234-09)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	3B	IC200	5L	IC501	10J	IC511	8F	IC520	5J
IC2	4Q	IC202	6L	IC502	9J	IC512	10H	IC521	7I
IC3	4B	IC203	7L	IC503	5I	IC513	8G	IC522	7I
IC7	4Q	IC204	8L	IC505	10J	IC514	9I	IC524	9J
IC8	4R	IC205	8L	IC506	5I	IC515	7G	IC525	10G
IC9	3M	IC206	9L	IC507	9E	IC516	10C	IC702	6P
IC101	10O	IC207	6L	IC508	8G	IC517	7J	IC704	6Q
IC102	9O	IC208	5L	IC509	10I	IC518	10C	IC705	9Q
IC103	8O	IC401	3O	IC510	7F	IC519	9J	IC707	6O

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
Q4	5Q	Q10	5P	Q400	3N	Q503	9G	D2	3R	D400	4O	D406	3O	D415	3K
Q5	5P	Q11	4P	Q401	3N	Q504	10D	D4	5B	D401	4N	D407	3P	D416	4K
Q6	9Q	Q200	9M	Q402	4L	Q505	9G	D5	3H	D402	4N	D408	3N	D417	4J
Q7	9R	Q201	9N	Q403	3L	Q506	10C	D7	5Q	D403	4O	D409	3N	D418	4J
Q8	5Q	Q203	6O	Q501	11H	Q509	4G	D10	9Q	D404	4O	D410	2I	D419	4J
Q9	4Q	Q205	6N	Q502	11H	Q510	5G	D11	9Q	D405	4N	D411	2L	D420	3J

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
D412	2L	D421	3J	D430	5K
D413	3L	D422	3L	D500	11H
D414	4K	D423	2L	D501	11H
D415	3K	D424	3L	D502	9F
D416	4K	D425	4L	D503	4G
D417	4J	D426	3L	D506	11J
D418	4J	D427	4L	D508	11J
D419	4J	D428	5J	D509	10P
D420	3J	D429	5J	D512	10Q



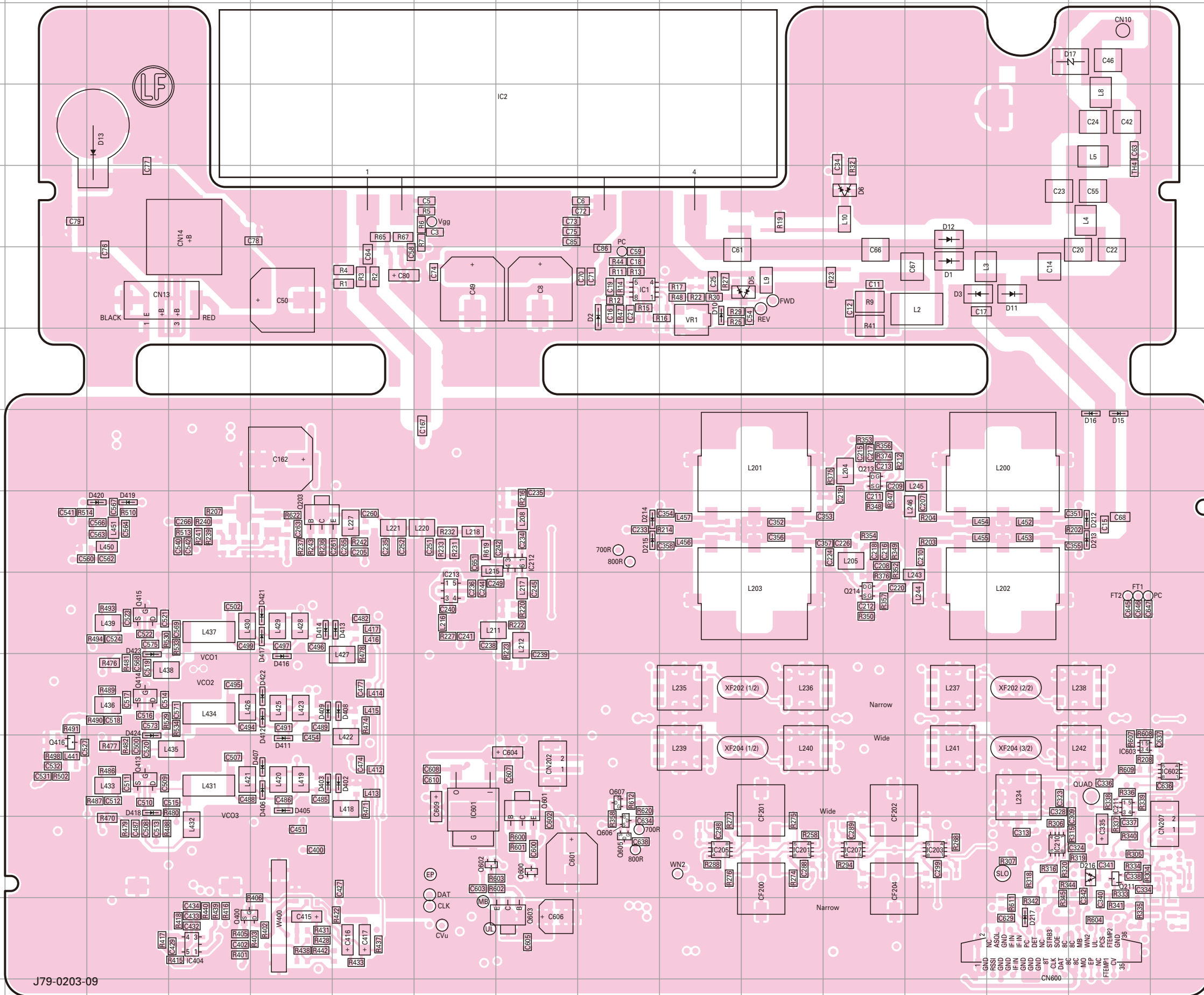


# TK-5910(B) PC BOARD

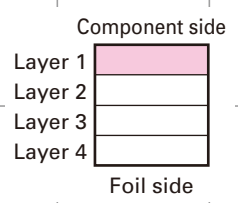
# PC BOARD TK-5910(B)

TX-RX UNIT (X57-7610-10) Component side view (J79-0203-09)

TX-RX UNIT (X57-7610-10) Component side view (J79-0203-09)



Ref. No.	Address	Ref. No.	Address
IC1	5I	D6	4L
IC2	3H	D10	5J
IC201	12K	D11	5N
IC203	12M	D12	4M
IC205	12J	D13	3C
IC207	12L	D15	7O
IC210	12N	D16	7O
IC211	11O	D17	2O
IC212	8H	D212	8O
IC213	9G	D213	8O
IC404	13D	D214	8I
IC601	11G	D215	8I
IC602	11P	D216	12O
IC603	11O	D217	13N
Q203	8E	D402	11F
Q211	12O	D403	11E
Q213	7L	D405	11E
Q214	9L	D406	11E
Q400	13D	D407	11E
Q413	11C	D408	10F
Q414	10C	D409	10E
Q415	9C	D411	11E
Q416	11B	D412	10E
Q600	12H	D413	9F
Q601	11H	D414	9E
Q602	12G	D416	10E
Q603	13H	D417	9E
Q605	12I	D418	11C
Q606	12I	D419	8C
Q607	11I	D420	8C
D1	5M	D421	9E
D2	5I	D422	10E
D3	5M	D423	10C
D5	5K	D424	11C



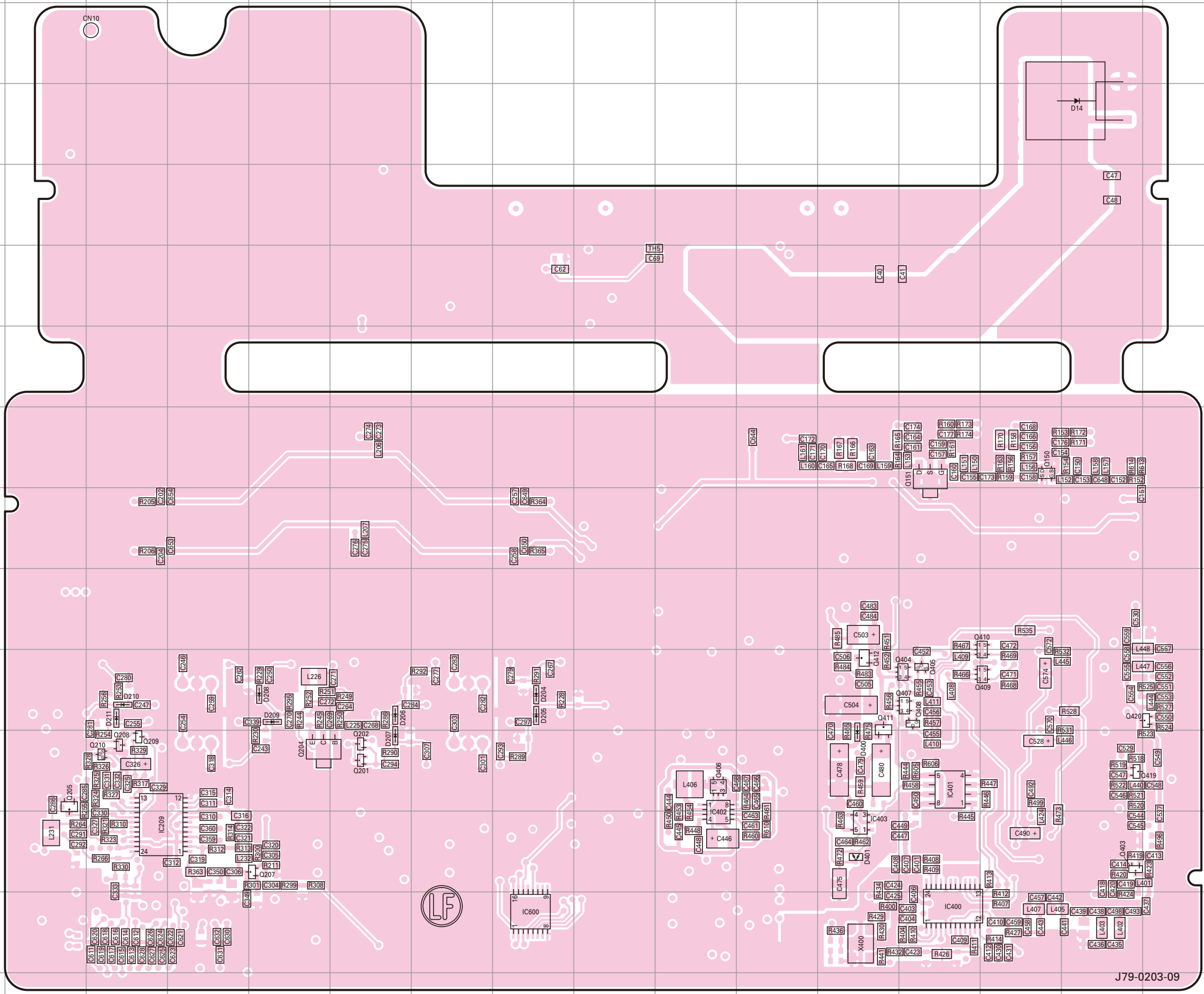
J79-0203-09

# TK-5910(B) PC BOARD

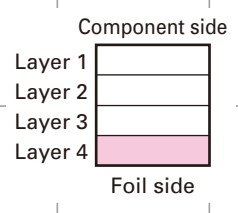
TX-RX UNIT (X57-7610-10) Foil side view (J79-0203-09)

# PC BOARD TK-5910(B)

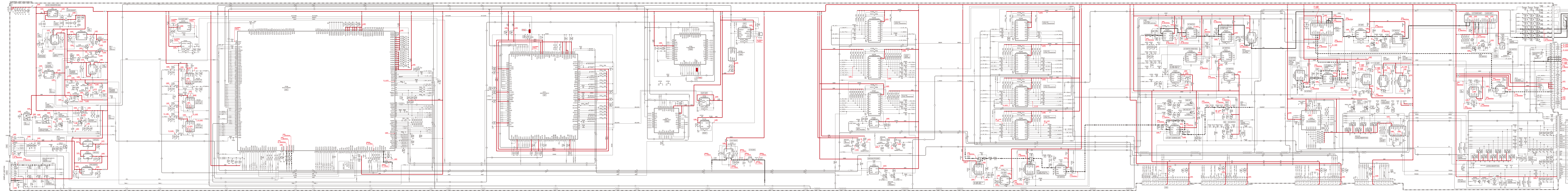
TX-RX UNIT (X57-7610-10) Foil side view (J79-0203-09)

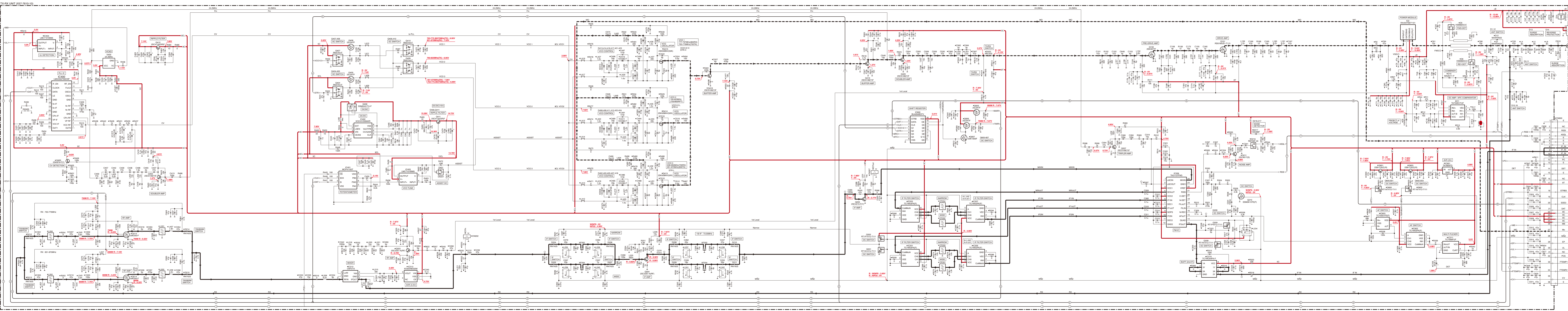


Ref. No.	Address
IC209	12C
IC400	13M
IC401	11M
IC403	12L
IC600	13H
Q150	7N
Q151	7M
Q201	11F
Q202	11F
Q204	11E
Q205	11B
Q207	12E
Q208	11C
Q209	11C
Q210	11C
Q403	12O
Q404	10M
Q405	10M
Q406	11J
Q407	10M
Q408	10M
Q409	10N
Q410	9N
Q411	10L
Q412	10L
Q419	11O
Q420	10O
D14	3O
D204	10H
D205	10H
D206	10F
D207	11F
D208	10E
D209	10E
D210	10C
D211	10C
D400	11L
D401	12L

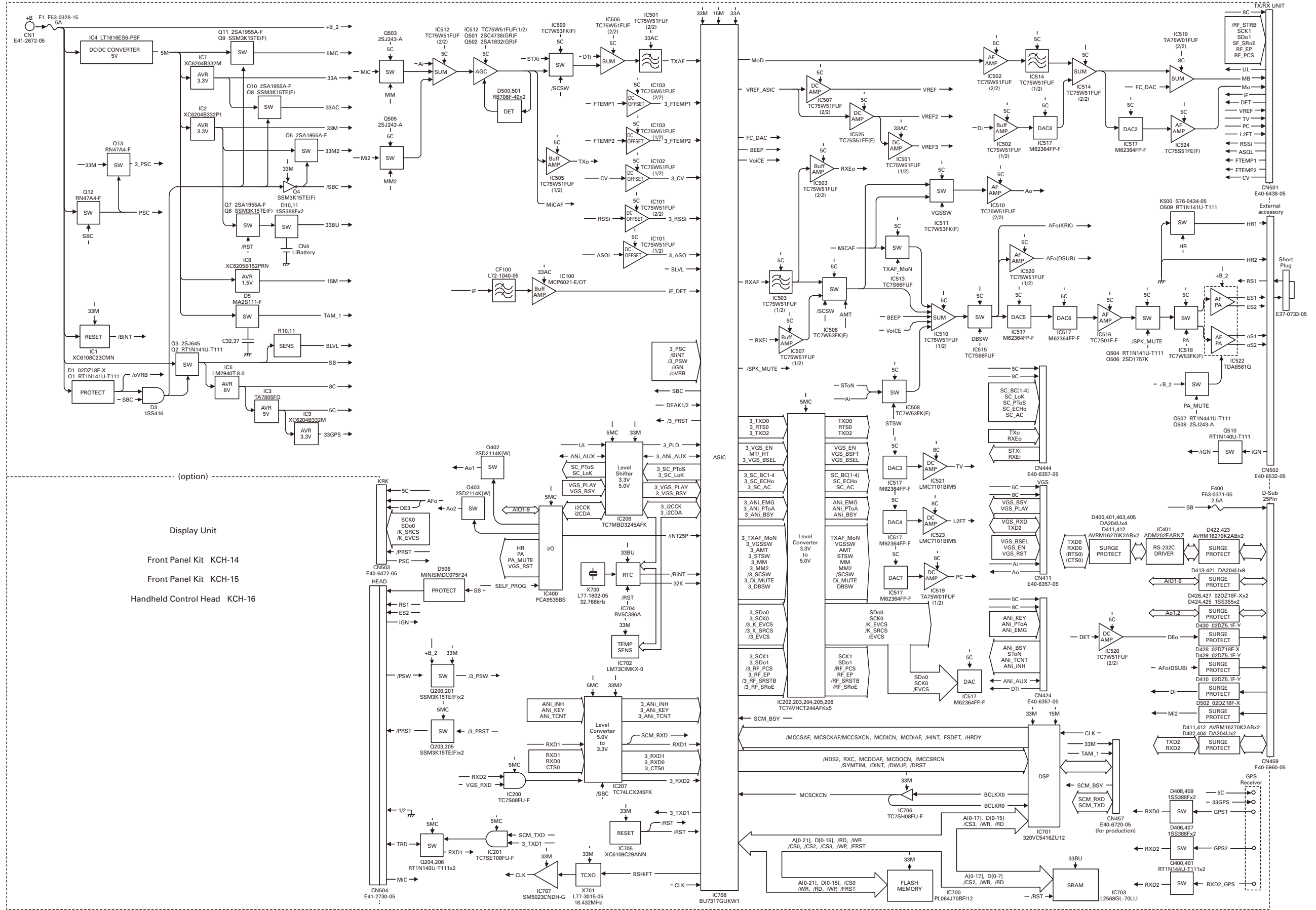


J79-0203-09





# Control unit (X53-4400-10)



(option)

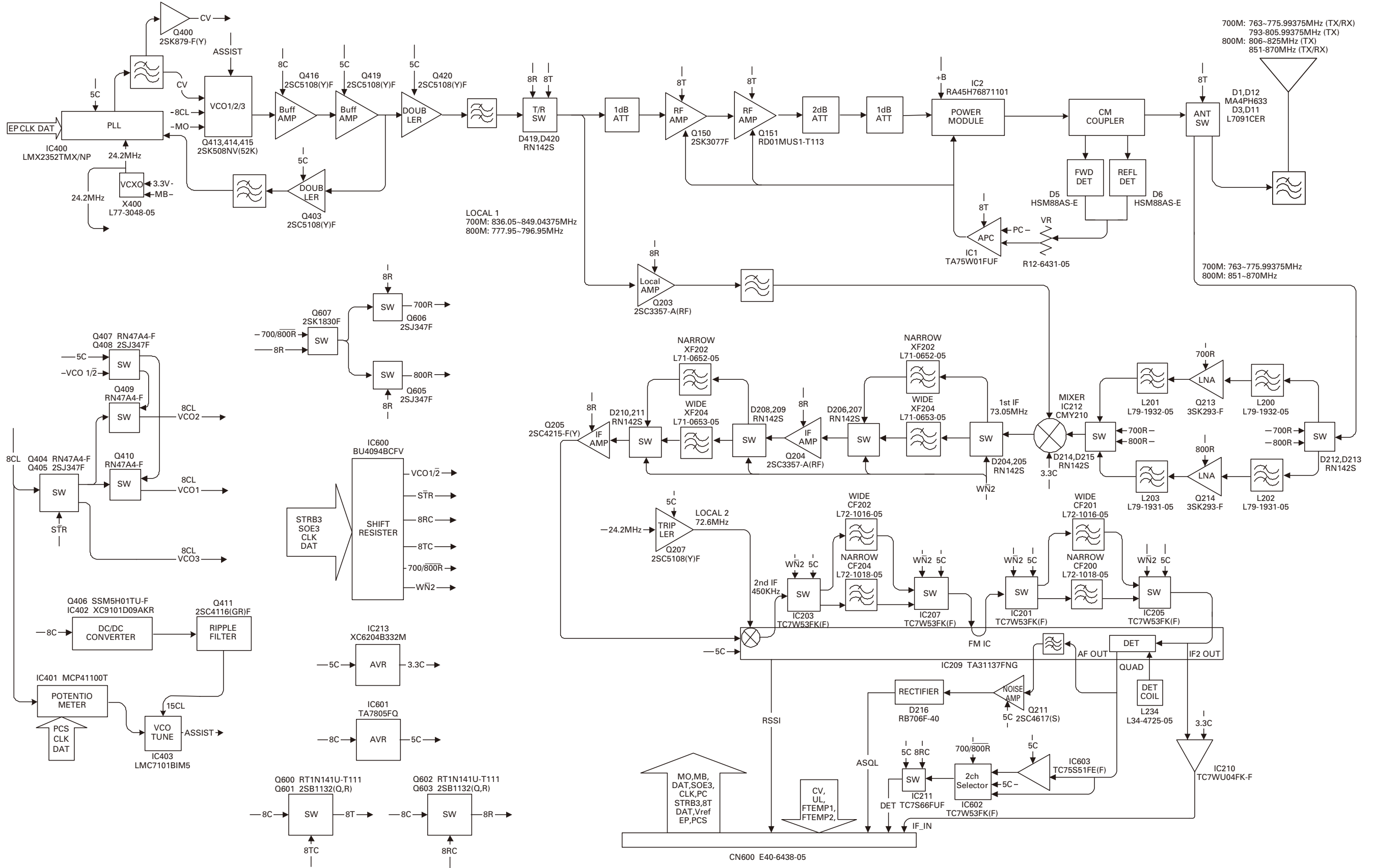
Display Unit

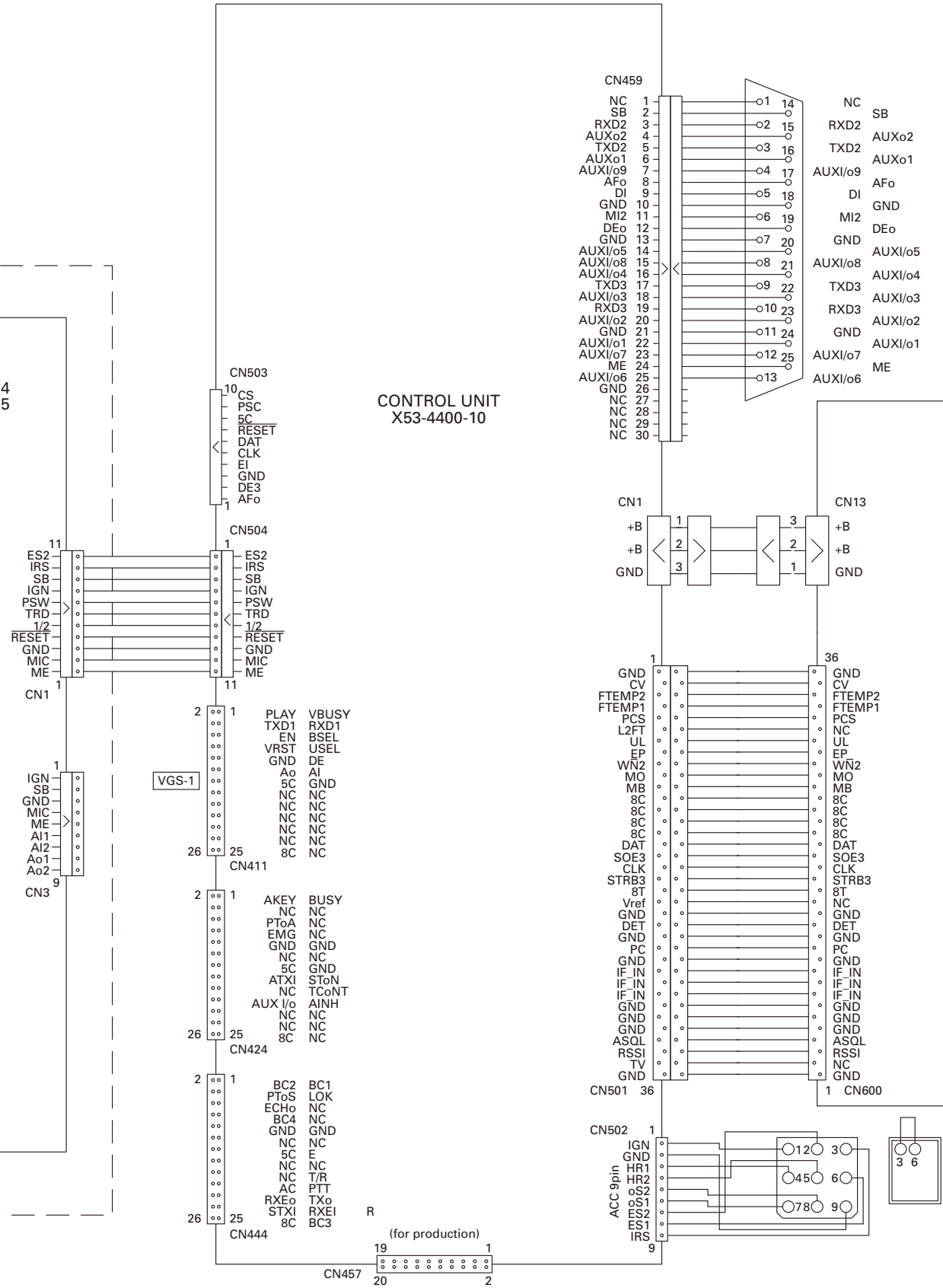
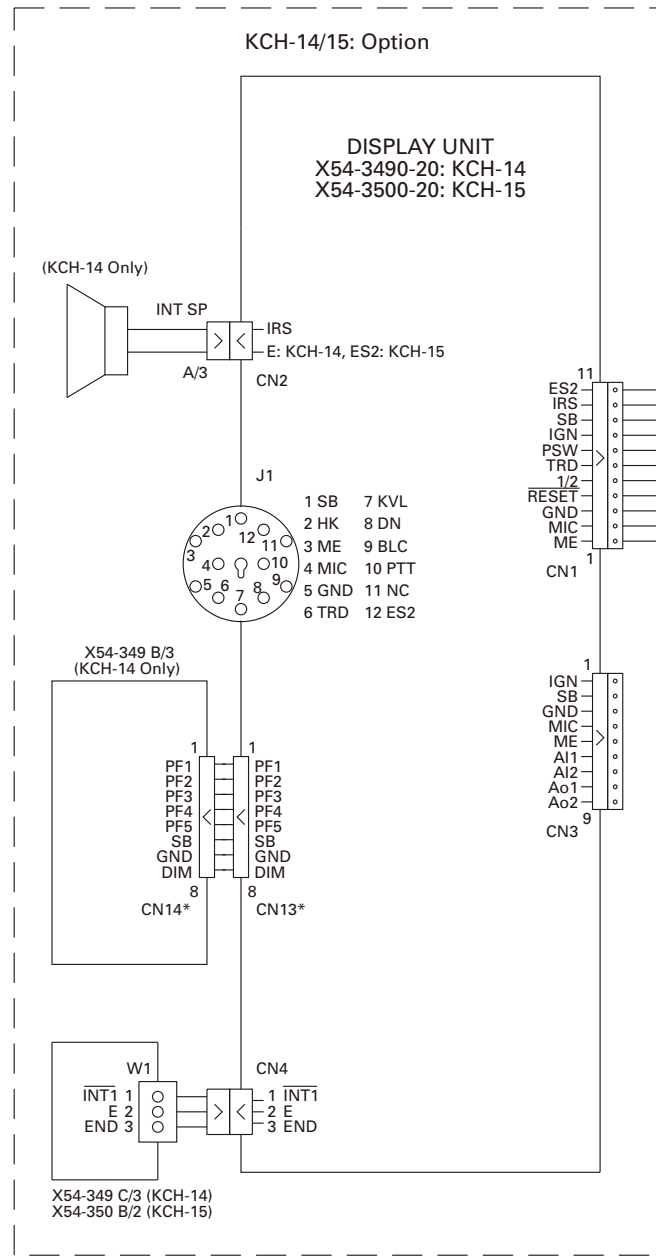
Front Panel Kit KCH-14

Front Panel Kit KCH-15

Handheld Control Head KCH-16

# TX-RX unit (X57-7610-10)





**TX-RX UNIT**  
 X57-7610-10

		CN13	CN14
X54-349	KCH-14	YES	YES
X54-350	KCH-15	NO	NO