

TK-5810(B) with KCH-14

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



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GENERAL

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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 this publication date. Changes which may occur after publication are covered by either Service Bulletins or Manual Revisions, which 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, and 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.

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.

GENERAL

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 5.00 or later for this transceiver. KPG-95D versions earlier than version 5.00 will not work properly.

TK-5810(B)

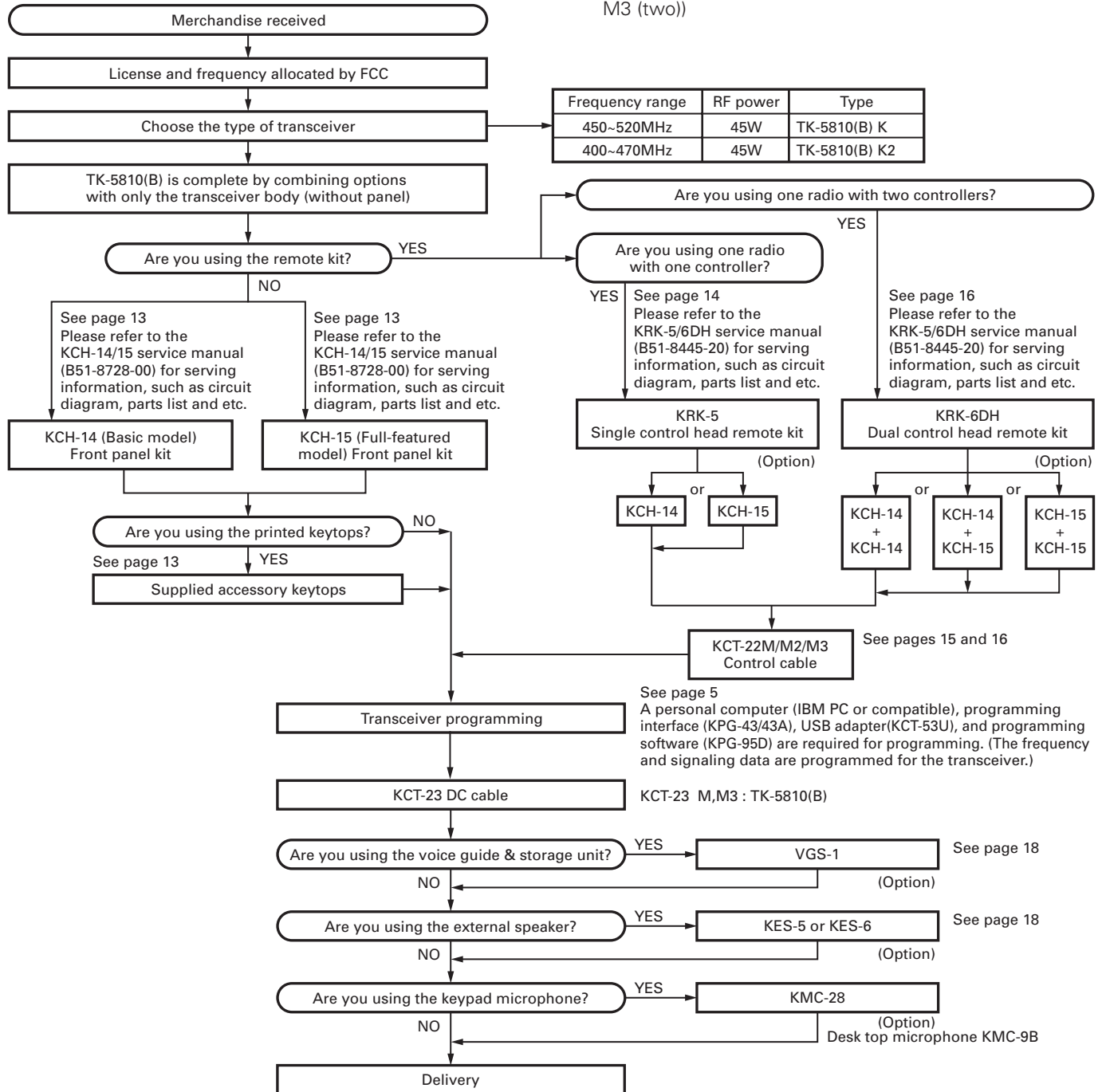
SYSTEM SET-UP

Before Reading About System Set-up

The TK-5810(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))

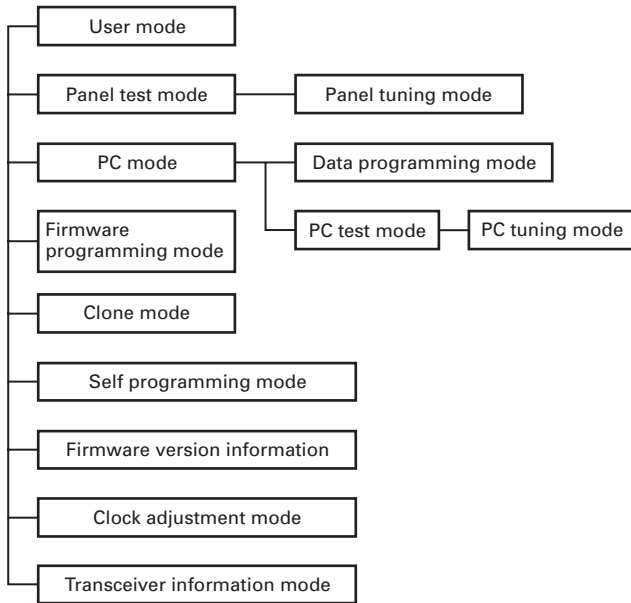


Service manual parts No. list

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

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 (IBM compatible).
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.
Clone mode	Used to transfer programming data from one transceiver to another.
Self programming mode	You can program the frequency, signaling and other functions using only the transceiver.
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
Clone mode	[PF5] + Power ON
Self programming mode	[GRP^] + 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).

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

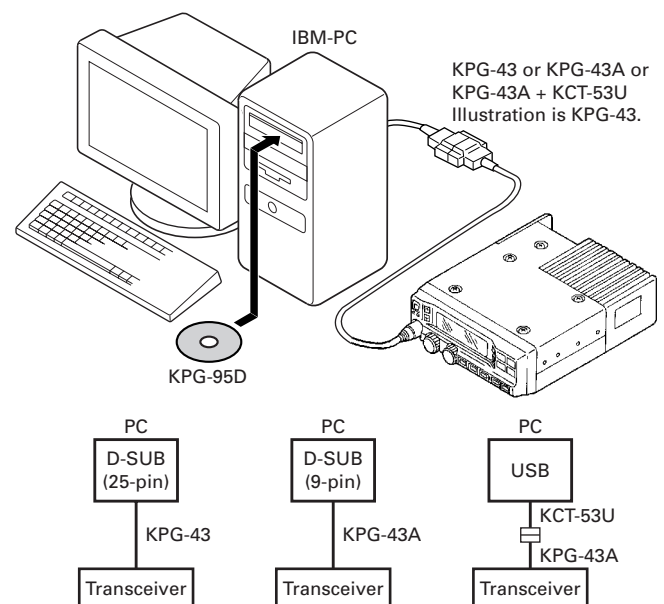


Fig. 1

TK-5810(B)

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.).

Notes:

- 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 EEPROM and 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 TTL 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 or XP.

5-5. Programming software KPG-95D description

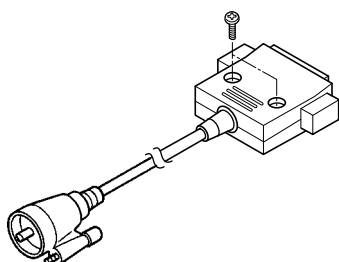
The KPG-95D is the programming software for the transceiver supplied on a CD-ROM. This software runs under MS-Windows 98, ME, Windows 2000 or XP on an IBM-PC or compatible machine.

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

6. PC Tuning Mode

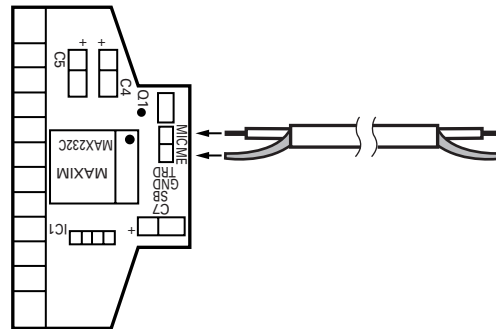
When making adjustment while in PC tuning mode, modify the KPG-43/43A programming interface cable as described below.

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

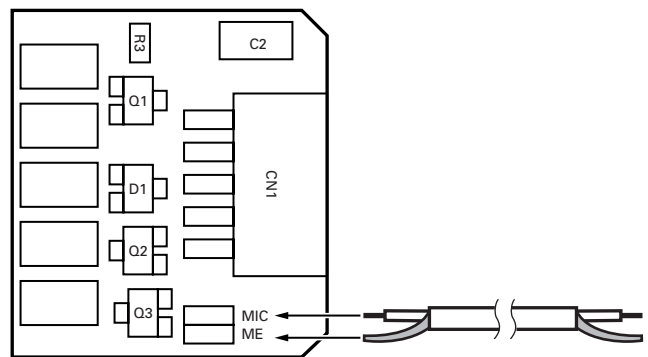


2. Solder the lead wire onto the MIC tab on the PCB, and the ground wire onto the ME tab.

- KPG-43



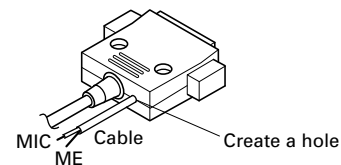
- KPG-43A



- 3.

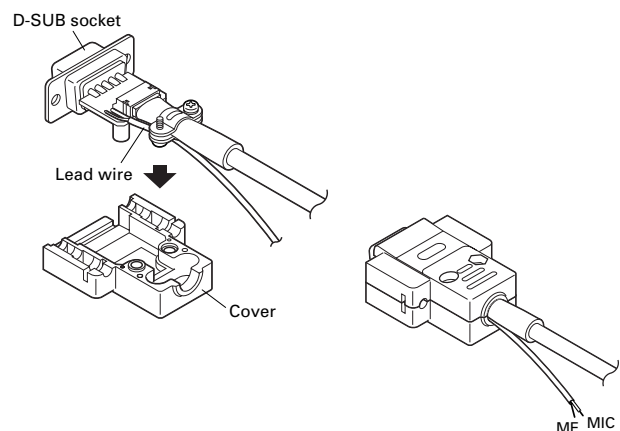
- KPG-43

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.



- 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.



REALIGNMENT

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 (IBM PC or compatible) 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 "PROG 115200" is displayed.
5. Check the connection between the transceiver and the personal computer, and make sure that the transceiver is in the Program mode.
6. Press "write" button in the window. When the transceiver starts to receive data, the [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.

Notes:

- This mode cannot be entered if the Firmware Programming mode is set to Disable in the Programming software.
- These transceivers use firmware versions F4.00 or later. When using firmware versions earlier than version F4.00, a "Check connection" error message will appear on the LCD. Firmware versions earlier than version F4.00 will not write to the transceiver.

7-4. Baud rate change

1. If you press the [PF4] key while "PROG 115200" is displayed, the display changes to "PROG 57600" (The LED blinks orange). If you press the [PF4] key again while "PROG 57600" is displayed, the display changes to "PROG 19200" (The LED blinks green) to indicate that the write speed is low speed (19200 bps). If you press the [PF4] key again while "PROG 19200" is displayed, the display returns to "PROG 115200" (The LED lights orange).
2. If you press the [PF5] key while "PROG 115200" is displayed, the checksum is calculated, and a result is displayed. If you press the [PF5] key again while the checksum is displayed, "PROG 115200" is redisplayed.

Note: Normally, write in the high-speed mode.

8. Clone Mode

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

The following data cannot be cloned.

- Tuning data
 - Embedded message with password
 - Model name data
 - ESN (Electronic Serial Number) data
 - Network file data (P25)
1. Press and hold the [PF5] key while turning the transceiver power ON. If the Read authorization password is set to the transceiver, the transceiver displays "CLONE LOCK". If the password is not set, the transceiver displays "CLONE MODE".
 2. When you enter the correct password, and "CLONE MODE" is displayed, the transceiver can be used as the cloning source. The following describes how to enter the read authorization password.
 3.
 - **How to enter the read authorization password using the microphone keypad;**
If one of keys 0 to 9 is pressed while "CLONE LOCK" is displayed, the pressed number is displayed on the LCD. Each press of the key shifts the display in order to the left. If you press the [#] key, the least digit of the password is deleted.
When you enter the password and press the [*] key, "CLONE MODE" is displayed if the entered password is correct. If the password is incorrect, "CLONE LOCK" is redisplayed.
 - **How to enter the read authorization password using the [Selector] knob;**
If the [Selector] knob is rotated while "CLONE LOCK" is displayed, the number (0 to 9) flashes on the LCD. When you press the [GRP^] key, the currently selected number is determined. If you press the [PF3] key, the least digit of the password is deleted. If you press the [PF2] key after entering the password in this procedure, "CLONE MODE" is displayed if the entered password is correct. If the password is incorrect, "CLONE LOCK" is redisplayed.
 4. Power ON the target transceiver.
 5. Connect the cloning cable (part No. E30-3370-05) to the microphone jacks on the source and target.
 6. Press the [PF2] key on the source while the source displays "CLONE MODE". The data of the source is sent to the target. While the target is receiving the data, "PROGRAM" is displayed. When cloning of data is completed, the source displays "END", and the target automatically operates in the User mode. The target can then be operated by the same program as the source.
 7. The other target can be continuously cloned. When the [PF2] key on the source is pressed while the source displays "END", the source displays "CLONE MODE". Carry out the operation in step 4 to 6.

REALIGNMENT

Notes:

- Cannot be cloned if the overwrite password is programmed to the target.
- Cannot be cloned if the checksum in the Network File area of the source transceiver and the target transceiver is different.
- "Model Name and Market Code", "Head Configuration" and "Head Type" must be same to clone the transceiver. However, it may be unable to clone the transceiver depending on the enhanced features settings.
(Refer to the FPU for the enhanced features details.)
- Under certain conditions, clone mode cannot be activated even if the clone mode of the source transceiver is set to enable. Refer to the FPU for more details.

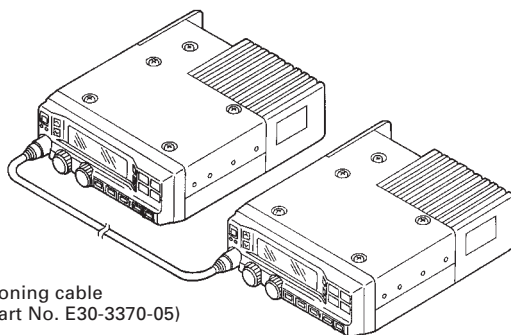
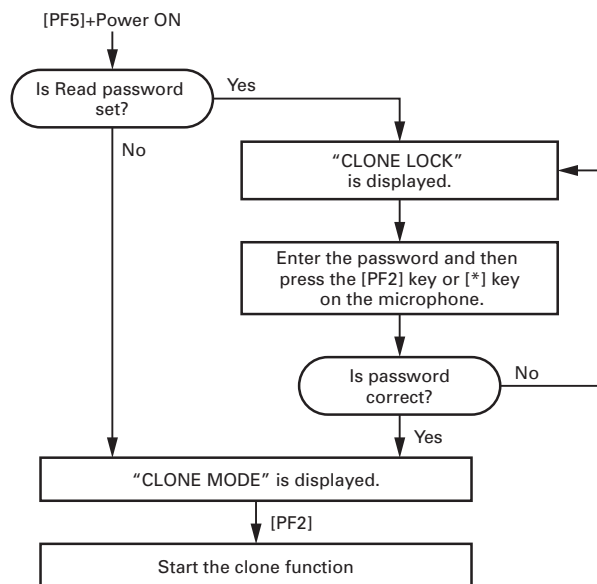


Fig. 2

Flow Chart (Source transceiver)



9. Self Programming Mode

Write mode for frequency data and signaling etc. To be used ONLY by the authorized service person maintaining the user's equipment. After programming, reset the FPU to the "Self- Programming" disabled mode. Transceivers CANNOT be delivered to the end-user in the self-programming mode.

The following setup items in the channels programmed by the FPU can be changed using the self-programming mode. The addition of new channel and the deletion of channel that has already been programmed by the FPU cannot be performed using the self-programming mode.

- RX Frequency
- TX Frequency
- Channel Type
- TX Mode (When the channel type is selected "MIXED".)
- Channel Spacing
- RX Signaling
- TX Signaling
- RX NAC
- TX NAC
- Talkgroup List No.

Note:

The personality will be also changed when the above-mentioned items is changed. (Refer to the FPU for the personality details.)

9-1. Enter to the self programming mode

Press and hold the [GRP^] key while turning the transceiver power ON. Ignoring whether the Read authorization password is set or not, "PASSWORD" appears.

If the Read authorization password is not set to the transceiver, "SELF PG MODE" is displayed on the LCD when the [PF2] key is pressed while "PASSWORD" is displayed.

If the password is set to the transceiver, "SELF PG MODE" is displayed on the LCD when you enter the correct password while "PASSWORD" is displayed.

For the password input method, see "8.Clone Mode" step 3 described on page 7.

Note :

This mode (self programming mode) cannot be set when it has been disabled with the FPU.

REALIGNMENT

9-2. Data writing

If the [PF4] key is pressed while Zone/Channel mode is displayed, new data is written into memory. "WRITING" is displayed while the transceiver is writing data.

The setup items for self programming mode are as follows.

No.	Setup item	Display	Remarks
1	Select Zone/Channel	** - **	Zone : 1~50, Channel : 1~250
2	RX Frequency	1**.***** MHz	Receive frequency
3	TX Frequency	1**.***** MHz	Transmit frequency
4	Channel Type	TYPE	ANALOG/P25/MIXED
5	TX Mode	MODE	ANALOG/P25
6	Channel Spacing	SPACE	25.0kHz/12.5kHz (When the Channel type is selected "ANALOG" or "MIXED".) P25 12.5kHz/12.5kHz (When the Channel type is selected "P25".)
7	RX Signaling	RX-SIG	Receive QT/DQT
8	TX Signaling	TX-SIG	Transmit QT/DQT
9	RX NAC	RX-NAC ***	000~FFF (Hexadecimal) Note:"F7F" cannot be set.
10	TX NAC	TX-NAC ***	000~FFF (Hexadecimal) Note:"F7E" and "F7F"cannot be set.
11	Talkgroup List No.	None	When you do not want to set the Talkgroup list number to the transceiver.
		***	Talkgroup list number (1~250) (When the Talkgroup list name is not set to the transceiver.)
		*****	Talkgroup list name (12 digits) (When the Talkgroup list name is set to the transceiver.)

REALIGNMENT

Key operation

• Normal mode

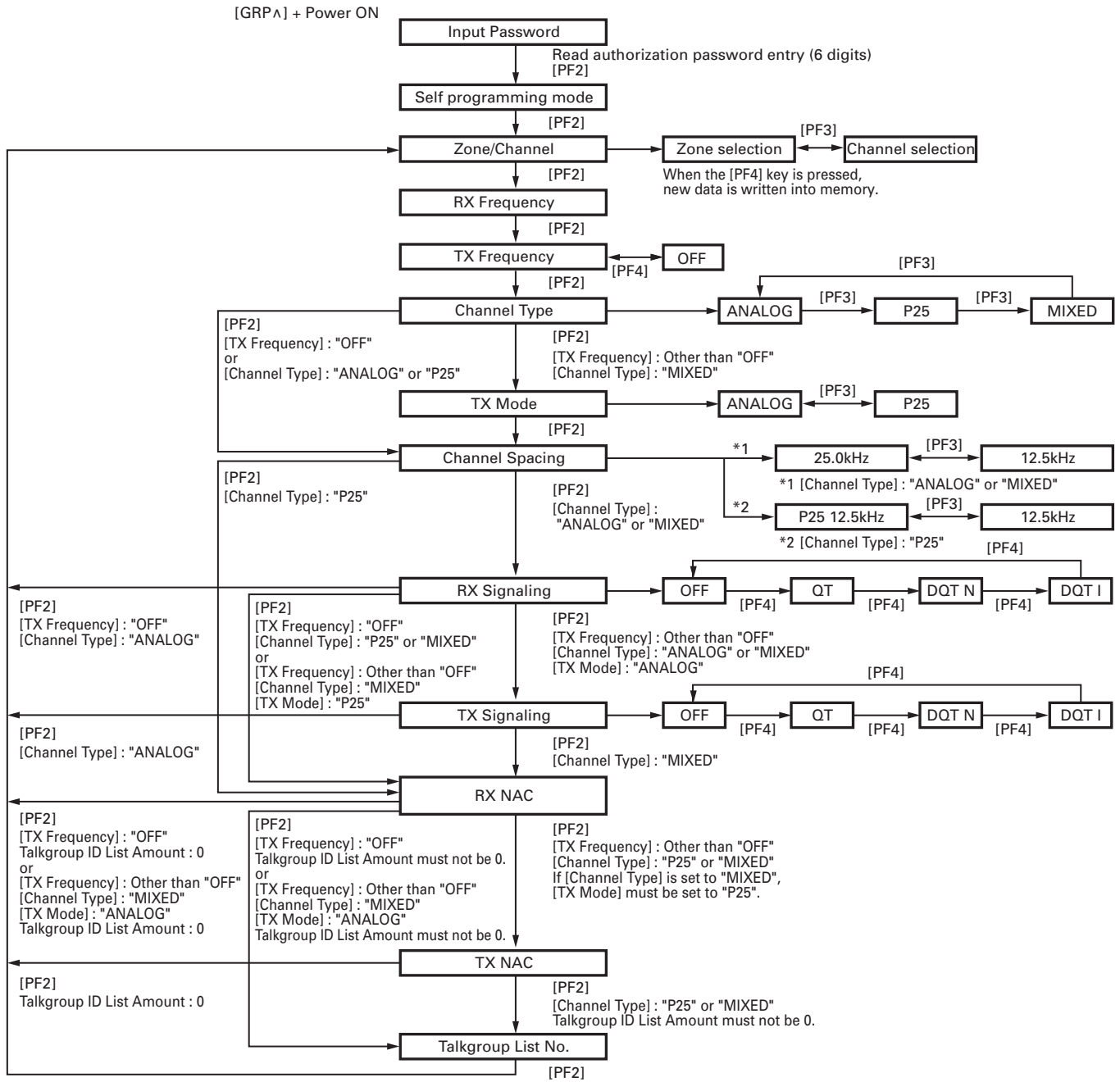
Key \ Item	Zone- Channel	RX Frequency	TX Frequency	Channel Type	TX Mode	Channel Spacing	RX Signaling	TX Signaling	RX NAC	TX NAC	TG List No.
[PF1]	Unused										
[PF2]	Go to the next item										
[PF3]	Zone/ Channel switching	2.5kHz/ 5kHz/ 6. 25kHz/ 7.5kHz/ 1MHz step switching		ANALOG/ P25/ MIXED switching	ANALOG/P25 switching	Channel Spacing switching	1step/ Standard switching		Delete the least digit from the current number (Press and hold to delete all numbers.)		Unused
[PF4]	Data Writing	Unused	ON/ OFF switching	Unused			QT/ DQT(N)/ DQT(I)/ OFF switching		Unused		
[PF5]	Unused										
[Selector]	Zone/ Channel up/ down	1step up/ down		Unused			Signaling up/ down		Increment/ Decrement a number in the specified digit		TG List number up/ down
[GRP^]	Zone/ Channel up	1step up		Unused			Signaling up		Determine the least digit		TG List number up
[GRPv]	Zone/ Channel down	1step down		Unused			Signaling down		Unused		TG List number down
MIC keypad ([0] to [9])	Unused	Go to the MIC keypad input mode		Unused			Go to the MIC keypad input mode		Add a digit to the current number		Unused
MIC keypad ([*)	Unused										
MIC keypad ([#])	Unused								Delete the least digit from the current number (Press and hold to delete all numbers.)		Unused
MIC PTT	Unused								[PTT] + [2] : "A" [PTT] + [5] : "B" [PTT] + [8] : "C" [PTT] + [0] : "D" [PTT] + [#] : "E" [PTT] + [*] : "F"		Unused

• MIC keypad input mode

Key \ Item	RX Frequency	TX Frequency	RX Signaling	TX Signaling
[PF1]	Cancel the MIC keypad input mode (Return to the normal mode)			
[PF2]	Cancel the MIC keypad input mode (Return to the normal mode)			
[PF3]	Delete the least digit from the current number (Press and hold to delete all numbers.)			
[PF4]	Unused	ON/ OFF switching	QT/ DQT(N)/ DQT(I)/ OFF switching	
[PF5]	Unused			
[Selector]	Unused			
[GRP^]	Unused			
[GRPv]	Unused			
MIC keypad ([0] to [9])	Add a digit to the current number (Return to the normal mode automatically if all digit are entered.)			
MIC keypad ([*)	Cancel the MIC keypad input mode (Return to the normal mode)			
MIC keypad ([#])	Delete the least digit from the current number (Press and hold to delete all numbers.)			
MIC PTT	Unused			

REALIGNMENT

• Self programming mode flow chart

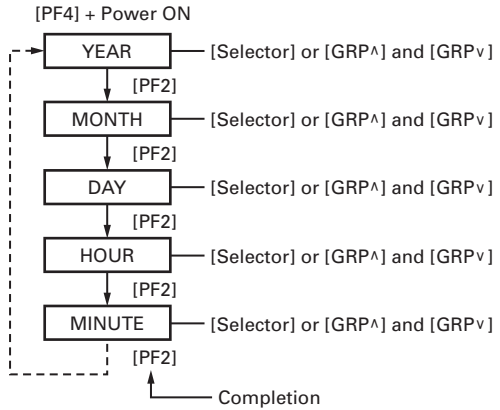


10. Firmware Version Information

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.

11. Clock Adjustment Mode

11-1. Flow chart of operation



12. 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 (X53-412) 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 23)

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.

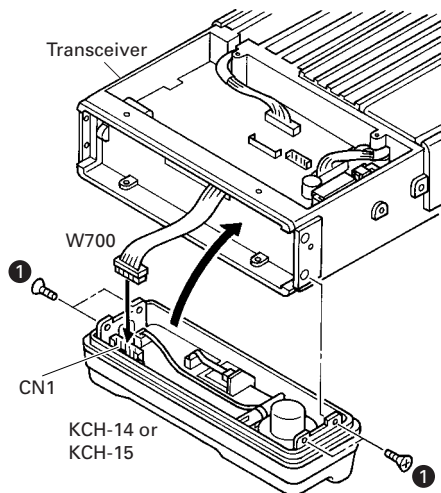


Fig. 1-1-1

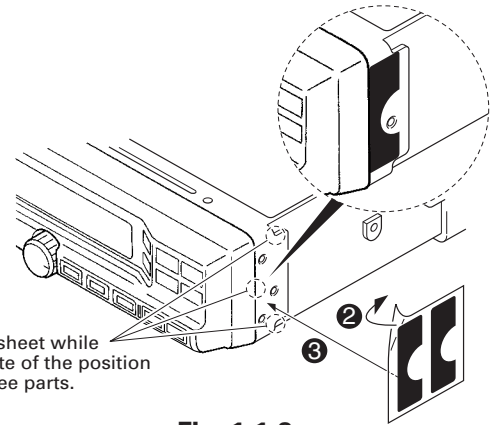


Fig. 1-1-2

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.

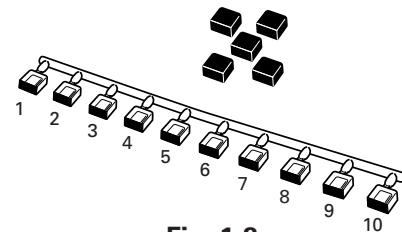


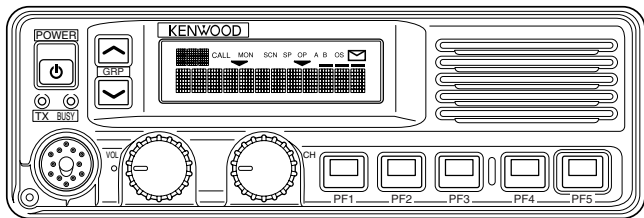
Fig. 1-2

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	v	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

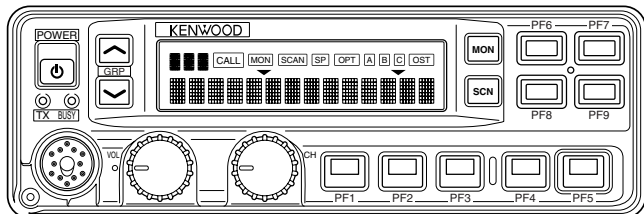


Fig. 1-3

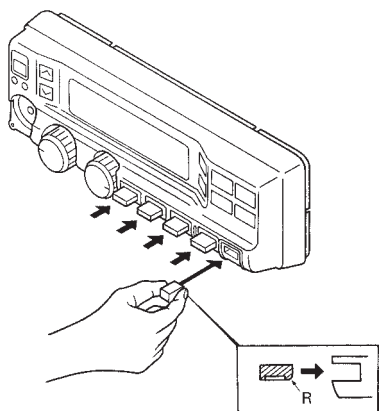


Fig. 1-4 Keytop insertion

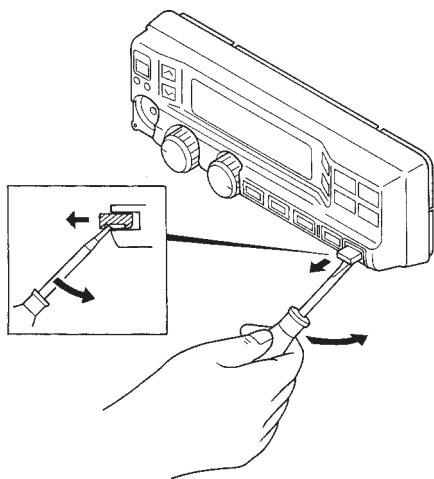


Fig. 1-5 Keytop removal

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 (X53-412) 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 23)

Note:

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

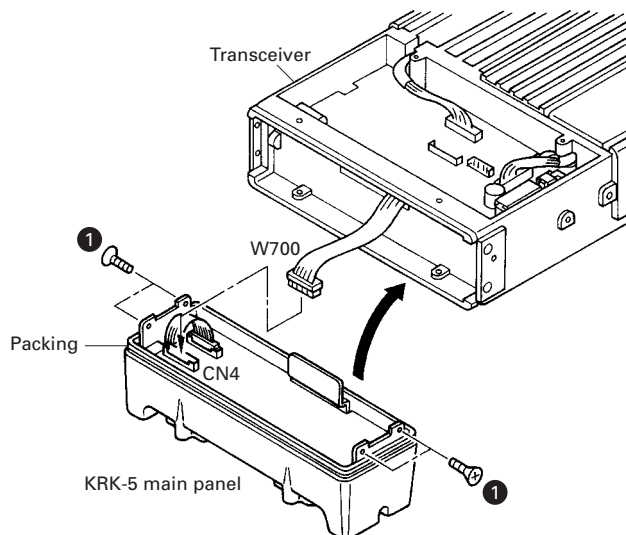


Fig. 2-1-1

INSTALLATION

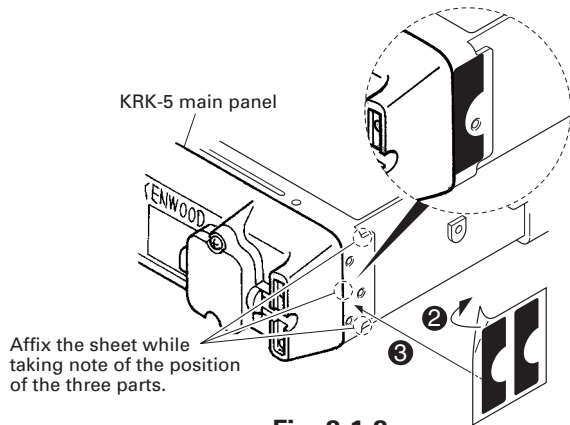


Fig. 2-1-2

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).

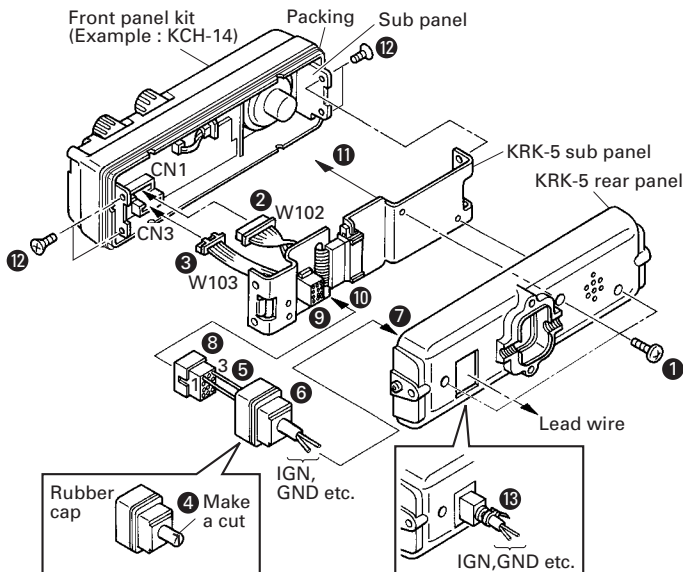


Fig. 2-2

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.

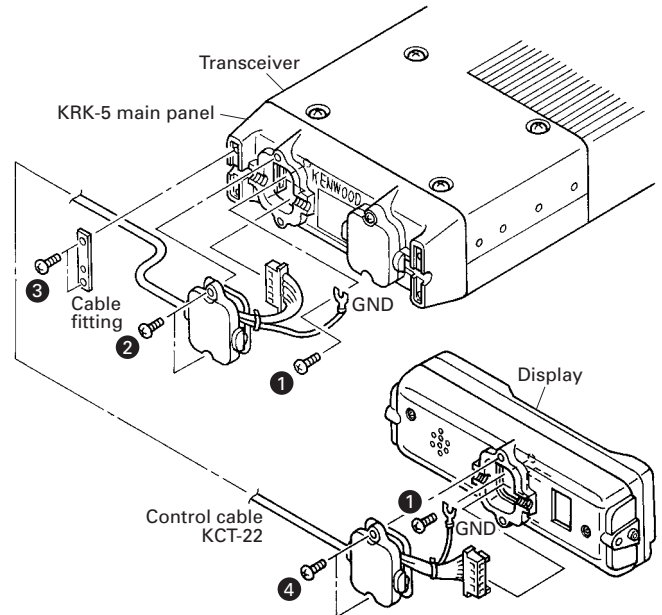


Fig. 2-3

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.

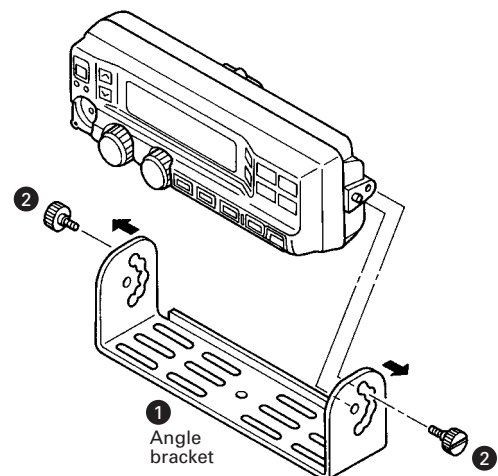


Fig. 2-4

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 (X53-412) into the connector (CN4) of the KRK-6DH. Insert the lead wire with connector (W104) of the KRK-6DH into the connector (CN724) of the transceiver.
3. Install the KRK-6DH main panel on the transceiver using four screws (1).

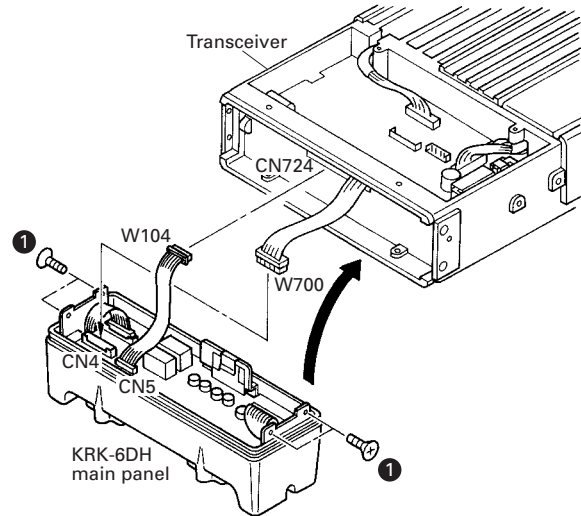


Fig. 3-1-1

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.

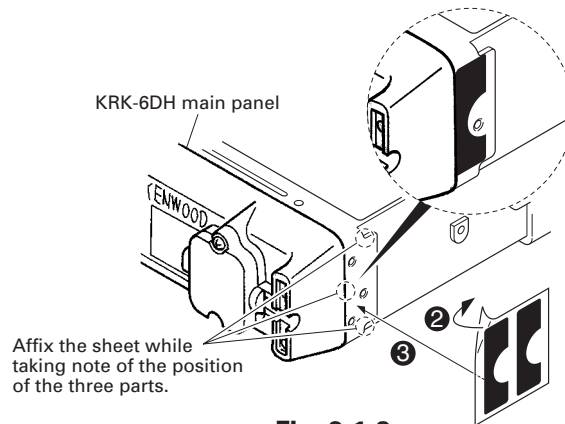


Fig. 3-1-2

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 23)

Note:

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

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 15.

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

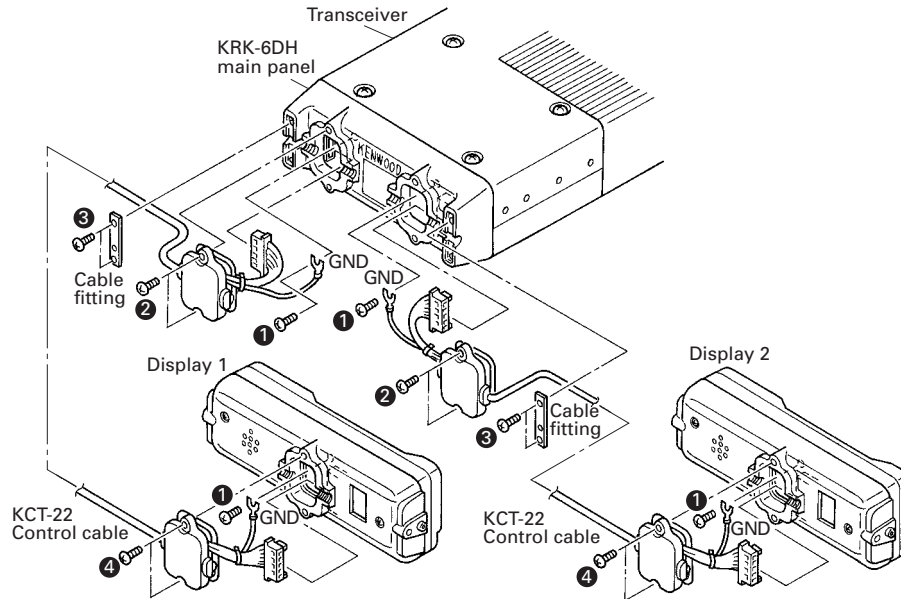


Fig. 3-2

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.

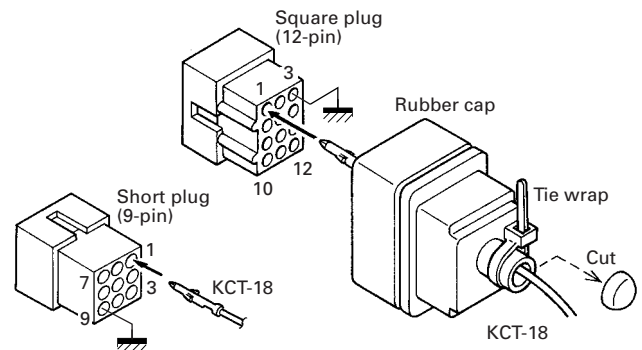


Fig. 4-1

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 (CN744).

Note: You must setup using the KPG-95D.

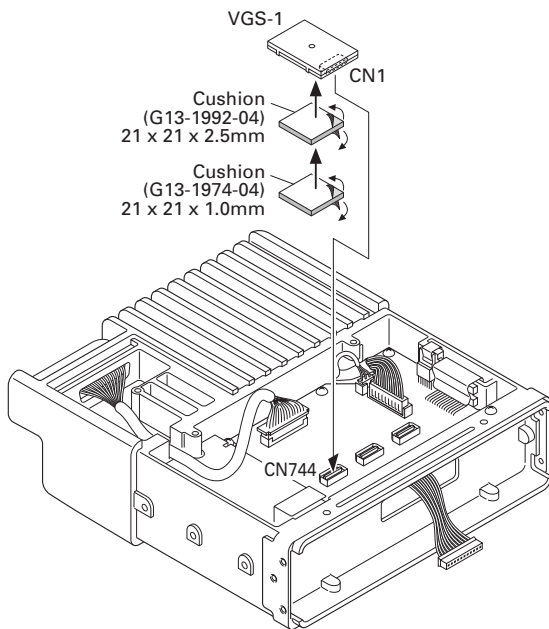


Fig. 5

6. External Speaker (KES-5/6: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 or KES-6.
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 or KES-6.

Note :

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

6-1. Connecting the KES-5/6 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.

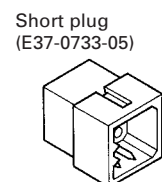


Fig. 6-1-1

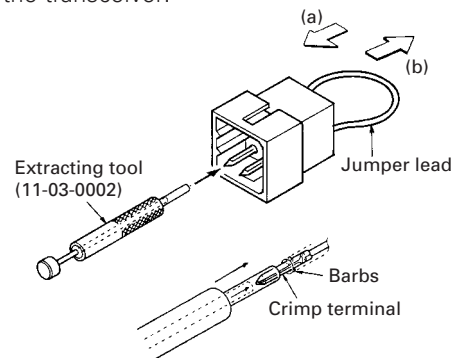


Fig. 6-1-2

INSTALLATION

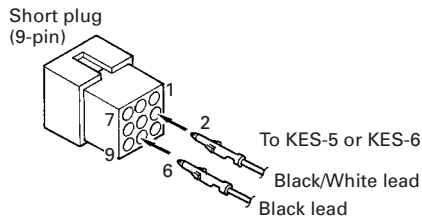


Fig. 6-1-3

6-2. Connecting the KES-5/6 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-5/6 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.

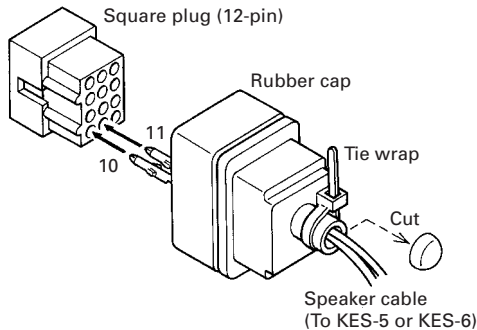


Fig. 6-2-1

- If the KCH-14 is used

If the KES-5 or KES-6 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.

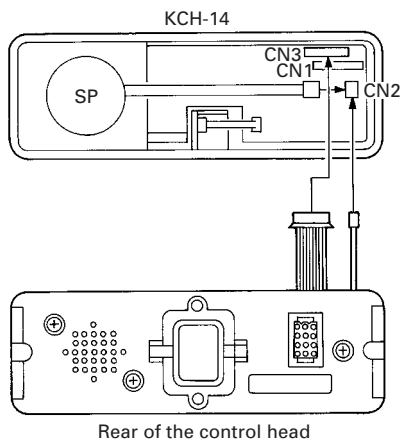


Fig. 6-2-2

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 SR73 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 or KES-6.

Note :

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

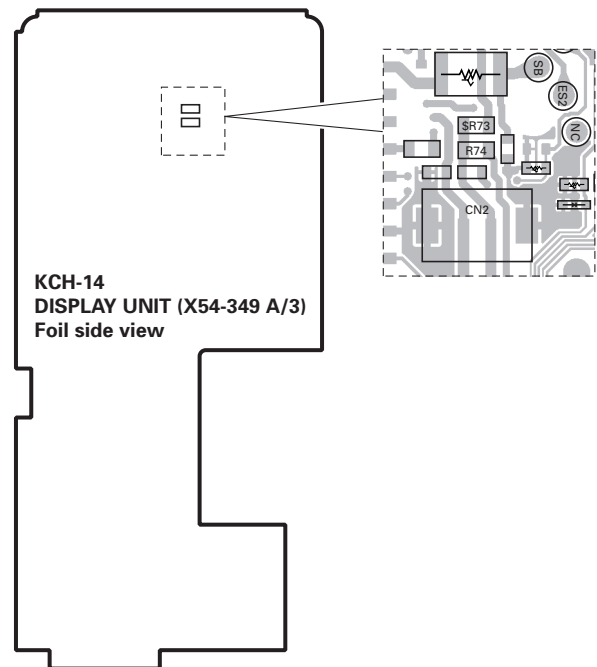


Fig. 6-3

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 18.)
2. Insert the KES-5/6 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

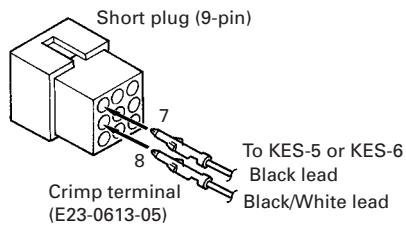


Fig. 6-4

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 (K700) 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) R960 on the control unit (X53-412) as shown in Table 1.
3. Reassemble the PC board and the upper case.

	Default	Modification
R960	Present	Absent
State		

Table 1

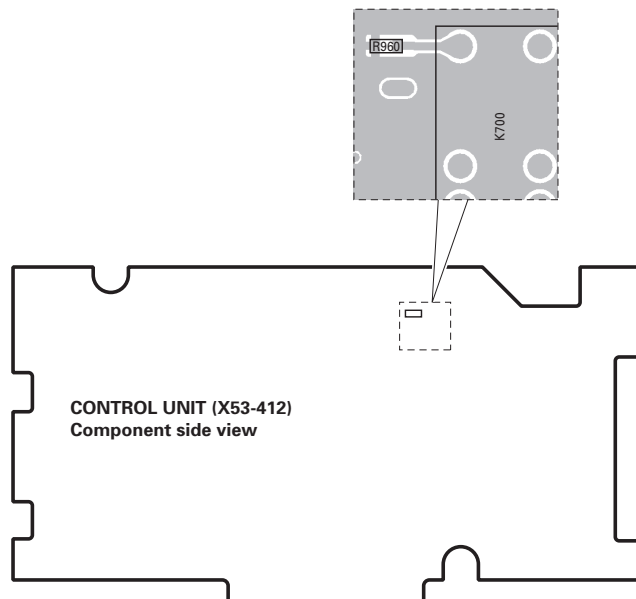


Fig. 7

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 (X57-727)

1. Remove the 7 screws ⑨ holding the PLL shield cover.
2. Remove the PLL shield cover ⑩.
3. Remove the coaxial cables from the two connectors (CN151, CN200) of the TX-RX unit ⑪.
4. Remove the flat cables from the two connectors (CN600, CN601) of the TX-RX unit ⑫.

Note :

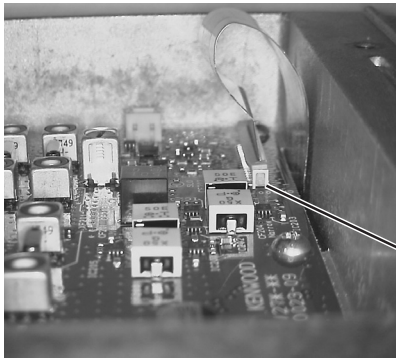
When re-installing the flat cable to the connector on the CN600 side, do not align the cable as shown in the figure 1, as there is a possibility of producing an effect on the sensitivity of P25.

5. Remove the 5 screws ⑬.

■ Removing the Final unit (X45-379)

1. Remove the cables from the connector (CN702) of the control unit ⑭.
2. Remove the 2 screws ⑮ holding the power module.
3. Remove the solder of the power module with a solder absorber.
4. Remove the 2 screws ⑯ holding the + (positive) terminal and - (negative) terminal of the power supply cable.
5. Remove the 8 screws ⑰ holding the final unit.
6. Remove the solder of the antenna receptacle with a solder absorber.

Wrong



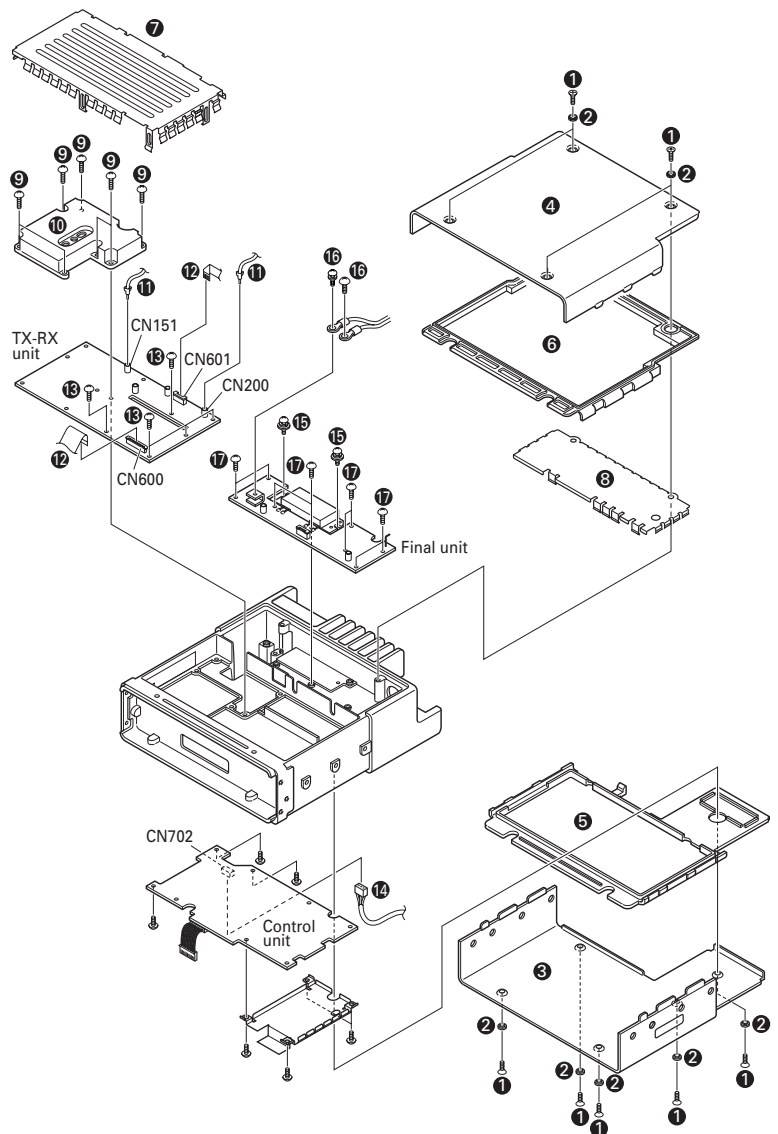
CN600

Fig. 1

Right



Fig. 2



TK-5810(B)

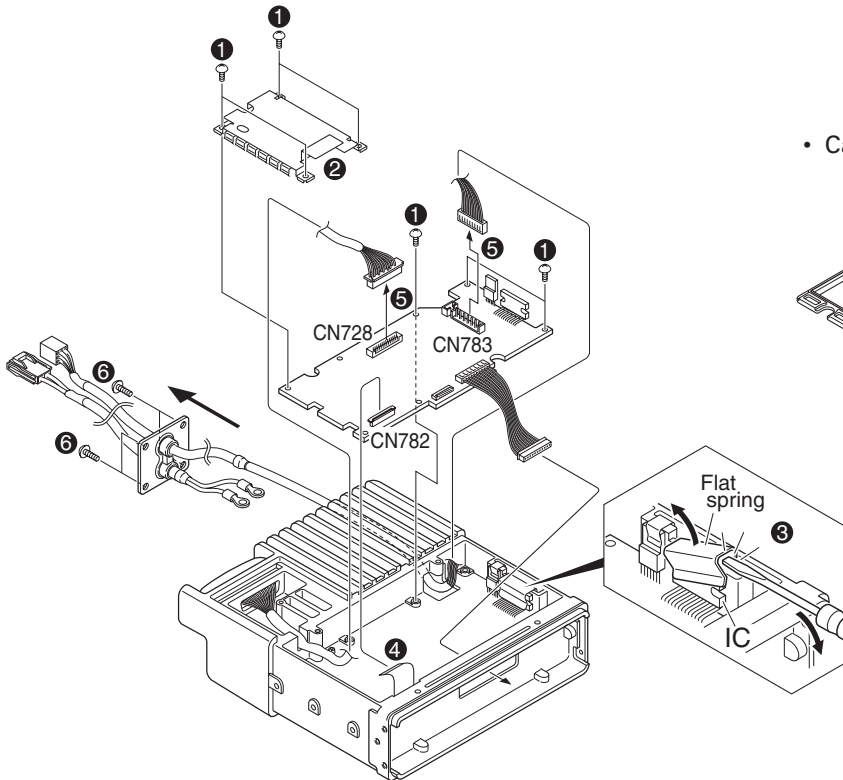
DISASSEMBLY FOR REPAIR

■ Removing the Control unit (X53-412)

1. Remove the 7 screws ①.
2. Remove the shield plate ②.
3. With a flat-head screwdriver, remove the 2 flat springs holding the ICs (IC706, IC732) ③.
4. Remove the flat cable from the connector (CN782) ④.
5. Remove the cables from the two connectors (CN728, CN783) 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 (CN783) 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

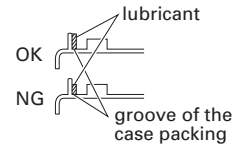
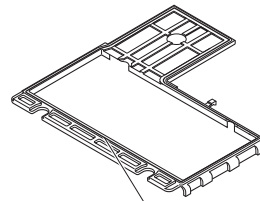
■ Painting the lubricant (Part No.:410-0019-05) on the groove of the case packing

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

Note :

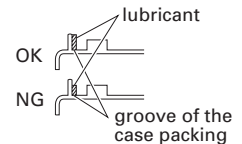
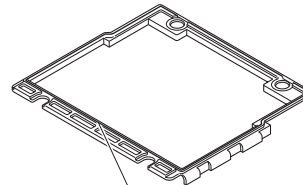
To assure waterproofing, paint the lubricant on the groove of the case packing.

- Case packing (Upper)



Paint the lubricant (Part No.410-0019-05) on the groove of the case packing.

- Case packing (Lower)



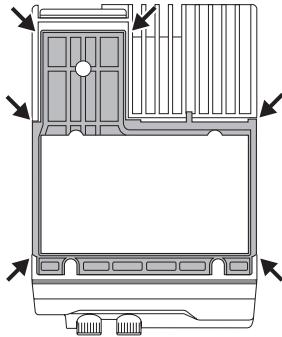
Paint the lubricant (Part No.410-0019-05) on the groove of the case packing.

DISASSEMBLY FOR REPAIR

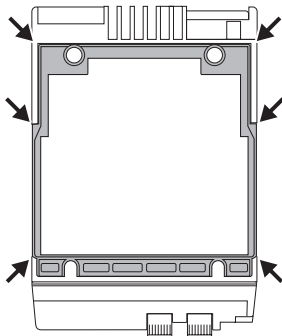
■ Procedures after installing the case packing to the chassis

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)



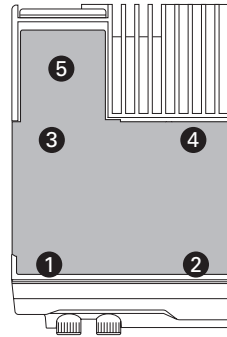
• Case packing (Lower)



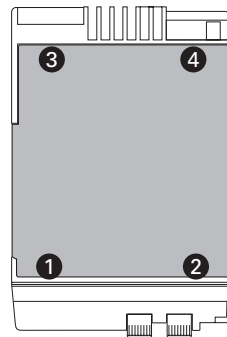
■ Sequence of tightening the screws for the upper / lower case to the chassis

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.

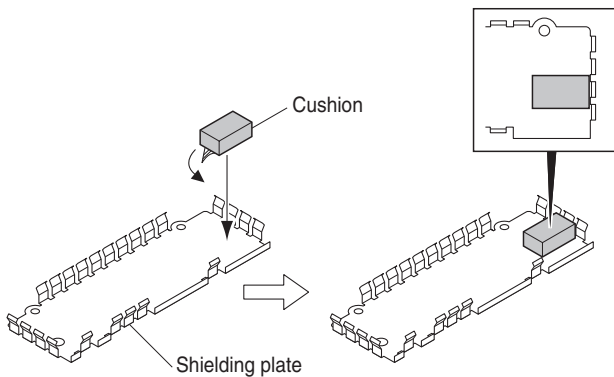
Installation Procedure during Parts Replacement

■ 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.

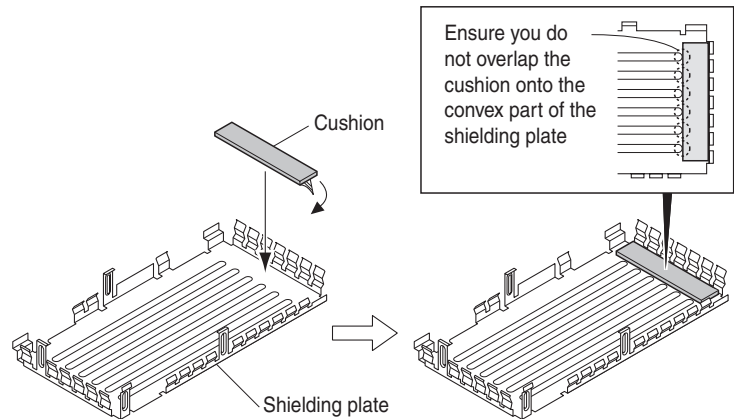


■ Attaching the new cushion (G13-2182-04) to the shielding plate

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

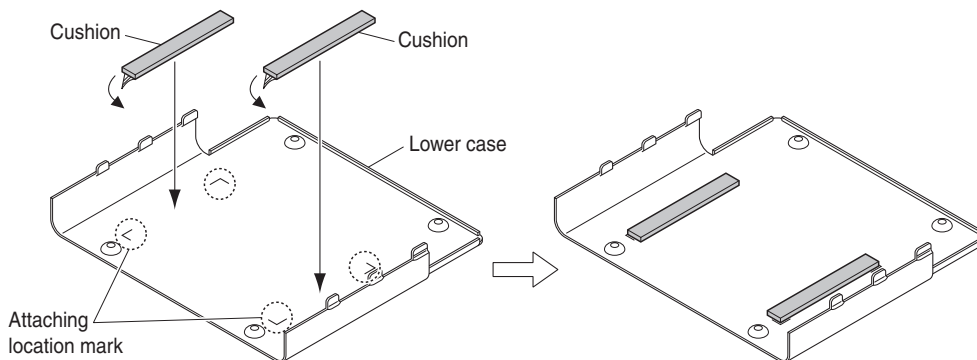
Notes :

- 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.



■ 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 UHF/FM/P25 mobile transceiver designed to operate in the frequency range of 450 to 520MHz (K) or 400 to 470MHz (K2).

The unit consists of receiver, transmitter, phase-locked loop (PLL) frequency synthesizer, base band parts, power supply, and control circuits.

2. Frequency Configuration

The receiver is a double-conversion superheterodyne using first intermediate frequency (IF) of 49.95MHz 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 49.95MHz.

This is then mixed with the 50.4MHz second local oscillator output 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.

This is then mixed with the 50.4MHz second local

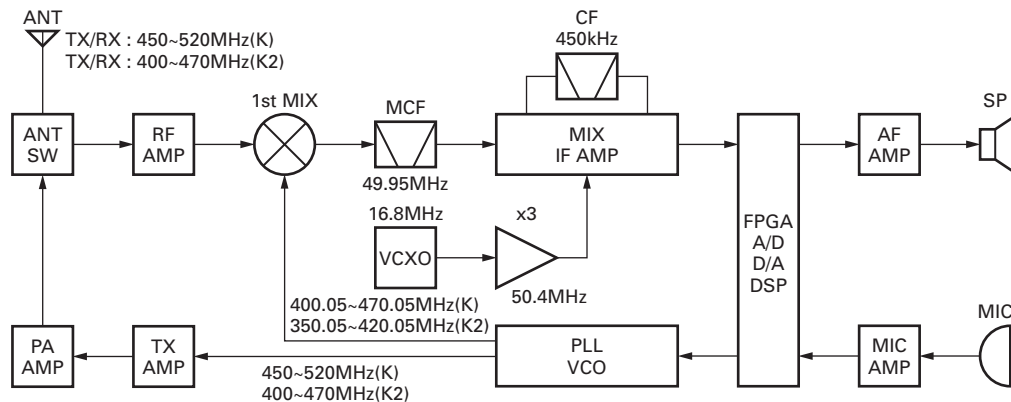


Fig. 1 Frequency configuration

3. Receiver System

3-1. Front-end RF Amplifier

The receive signal from the RX terminal (CN200) of the TX-RX unit (X57-727) is amplified by a transistor (Q200) and passes through the band-pass filter (L207, L208, L209, L210) to remove unwanted signal.

The signal passing through the band-pass filter goes into the 1st mixer.

These band-pass filters are tuned to a desired frequency by variable capacitance diode (D204, D205, D206, D207).

A tuning voltage corresponding to the desired signal is

applied to each variable capacitance diode to tune to the receive frequency.

3-2. 1st Local

The 1st mixer uses double balanced mixer (IC200).

The receive signal passing through the band-pass filter (L207, L208, L209, L210) and the 1st local signal generated by the VCO, are mixed by the 1st mixer (IC200) to produce a 1st IF signal (49.95 MHz) (Lower heterodyne).

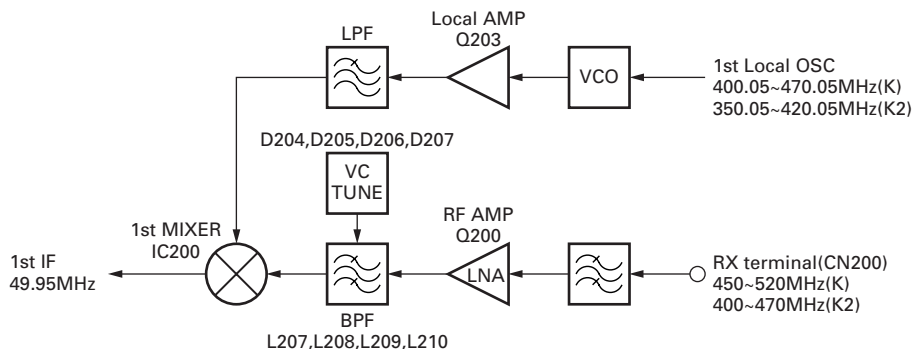


Fig. 2 Front-end RF amplifier and 1st local

CIRCUIT DESCRIPTION

3-3. 1st IF

The 1st IF signal passes through the MCF (Monolithic Crystal Filter) to remove unwanted signal.

The MCF has two paths (Wide band: XF201, Narrow band: XF200), and these are controlled with the IF filter switch (D208, D209, D210, D211, D212, D213, D214 and D215).

The signal passes through the MCF (XF201) when the Wide band (D209, D211, D213 and D215 are ON) is selected. The signal passes through the MCF (XF200) when the Narrow band (D208, D210, D212 and D214 are ON) is

selected.

The 1st IF signal passing through these MCFs is amplified by the IF amplifier (Q205) and goes into the FM IC (IC209).

3-4. 2nd Local

The 1st IF signal (49.95 MHz) amplified by the IF amplifier (Q205) and the 2nd local signal (50.4 MHz) generated by tripling the reference oscillator frequency (16.8 MHz) of the VCXO (X200) by Q207, are mixed in the FM IC (IC209) to produce a 2nd IF signal (450 kHz) (Upper heterodyne).

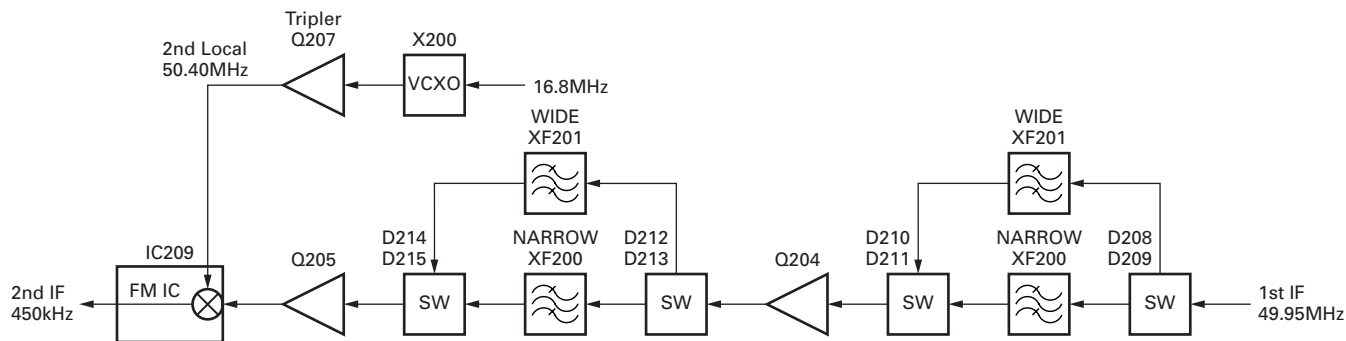


Fig. 3 1st IF and 2nd Local

3-5. 2nd IF

The 2nd IF signal passes through the ceramic filter to remove unwanted signal.

The ceramic filter has three paths (Wide band: CF201 and CF202, Narrow band: CF200 and CF204, P25 band: CF202 and CF203), and these are controlled with the multiplexers (IC201, IC202, IC203, IC205, IC206 and IC207).

The control line is W/N1, W/N2 and VN.

The signal passes through the ceramic filters (CF201 and CF202) when the Wide band (W/N1: high level, W/N2: high

level, VN: high level) is selected. The signal passes through the ceramic filters (CF200 and CF204) when the Narrow band (W/N1: low level, W/N2: low level, VN: high level) is selected. The signal passes through the ceramic filters (CF202 and CF203) when the P25 band (W/N1: high level, W/N2: low level, VN: low level) is selected.

The P25 signal is A/D-converted by the FPGA IC (IC730) and DSP IC (IC715), and is performed P25 demodulation. The detected FM signal and the P25 signal are fed to the CODEC IC (IC724) respectively.

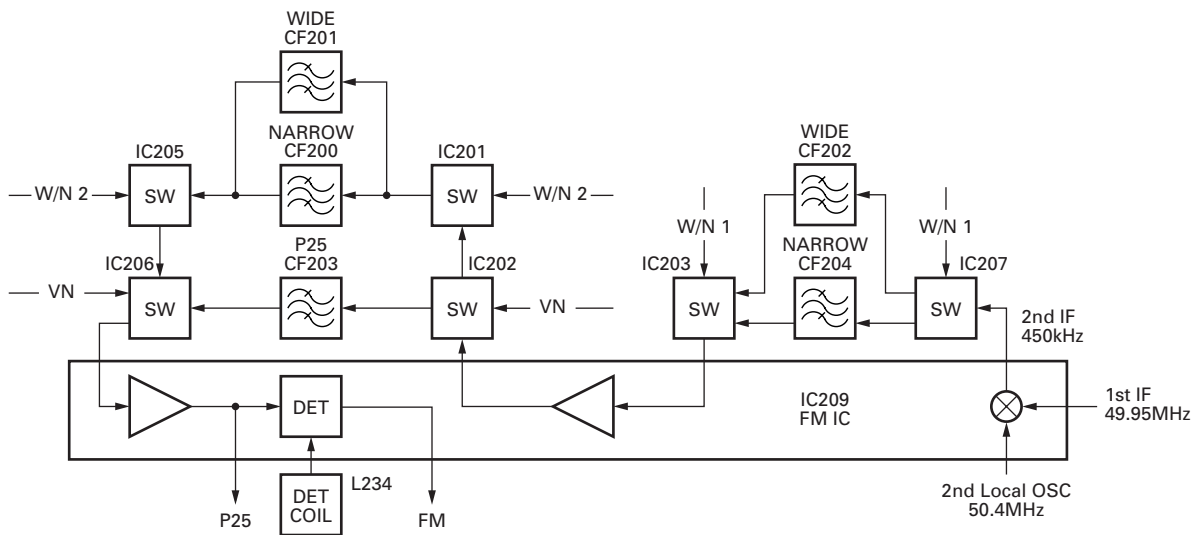


Fig. 4 2nd IF

CIRCUIT DESCRIPTION

3-6. Audio Amplifier Circuit

The AF signal from the CODEC IC (IC724) passes through the low-pass filter (IC729), analog switch (IC731) and summing amplifier (IC742), and then it goes into the D/A converter (IC738).

The output signal from the D/A converter (IC738) passes through the amplifier (IC739), audio mute switch (Q732) and analog switch (IC727), and then it is amplified by the audio amplifier (IC732).

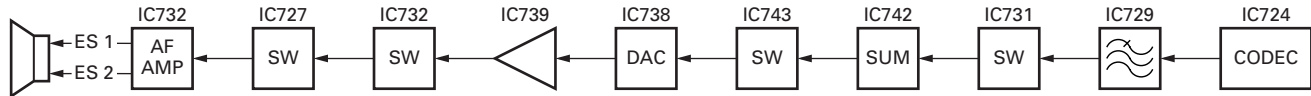


Fig. 5 Audio amplifier circuit

3-7. Squelch Circuit

A noise component is output from the FM IC (IC209). The desired noise signal is extracted by the band-pass filter, and is amplified by the noise amplifier (Q211).

The output signal from the noise amplifier is rectified by

D216 to produce a DC voltage, which is output from D216 as squelch voltage.

The squelch voltage goes into the ASQL terminal (pin 121) of the CPU (IC703) and is compared with the reference voltage preset in the CPU to control audio signal ON/OFF.

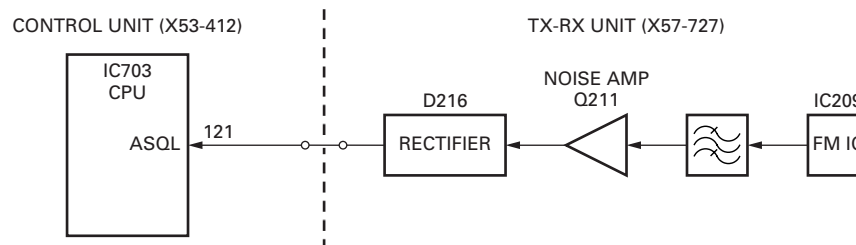


Fig. 6 Squelch circuit

4. Transmitter System

4-1. Microphone Circuit

The signal from the microphone passes through the mute switch (Q723), and the AGC circuit (IC719 1/2), and goes to the microphone amplifier IC (IC719 2/2). It is then fed into CODEC IC (IC724) and converted from analog to digital. The digitalized signal undergoes AGC processing, pre-emphasizing, filtering, and vocoding (in P25 mode), and then returns to the CODEC IC (IC724). The signal is converted from digital to analog and is amplified by IC729 and IC733 and fed into the D/A converter IC (IC738). The signal is then adjusted to the appropriate level and is passed through the buffer amplifier (IC735), before going to the VCO and VCXO in the PLL section.

The signal is applied to a varactor diode D418 in VCO and to the VC terminal of VCXO (X400).

4-2. Audio Band Circuit

The audio band circuit of the transmitter system consists of the following:

- Microphone mute switch (Q723)
- AGC (Automatic Gain Control) (Q715, Q716, IC719, D727, D728)
- Scrambler board switch (Q720)

The microphone mute switch (Q723) cuts off audio signals from the external microphone.

The AGC (Q715, Q716, IC719, D727, D728) is an amplifier that reduces gain automatically by greatly increasing the attenuation when the audio signal of a certain level or higher is present. It controls the gain so that the audio signal input to the CODEC IC (IC724) is not clipped.

If an optional scrambler board is installed, the switch (Q720) adjusts the signal path so that the audio signal is fed to the CODEC IC through the scrambler board.

The audio signal is fed to the CODEC IC (base band circuit) through the above path.

4-3. Base Band Circuit

The base band circuit of the transmitter system consists of the following:

- CODEC IC (IC724)
- DSP IC (IC715)
- LPF (Low-Pass Filter) (IC729)
- Summing amplifier (IC733)
- DAC (D/A Converter) (IC738)
- Buffer amplifier (IC735)

The audio signal output from the base band circuit is converted to digital data of a sampling frequency of 48 kHz and a quantization resolution of 16 bits. This digital data is sent to the DSP IC (IC715), and voice signals of 300 Hz or lower and frequencies of 3 kHz or higher are cut off and an audio range 300 Hz to 3 kHz is extracted.

CIRCUIT DESCRIPTION

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 CODEC IC. In P25 mode, the audio signal is converted to the C4FM base band signal and output from the CODEC IC. The DTMF and MSK base band signals are also generated by the DSP IC and output by the CODEC IC.

LPF (IC729) removes quantization noise from the base band signal output from the CODEC IC.

The summing amplifier (IC733) sets the base band signal level to the DAC input range.

The DAC (IC738) assigns the base band signal to the VCO (Q413) and VCXO (X400).

At this time, the level output according to the transmit carrier is fine-adjusted according to the modulation method of FM Wide, FM Narrow and P25.

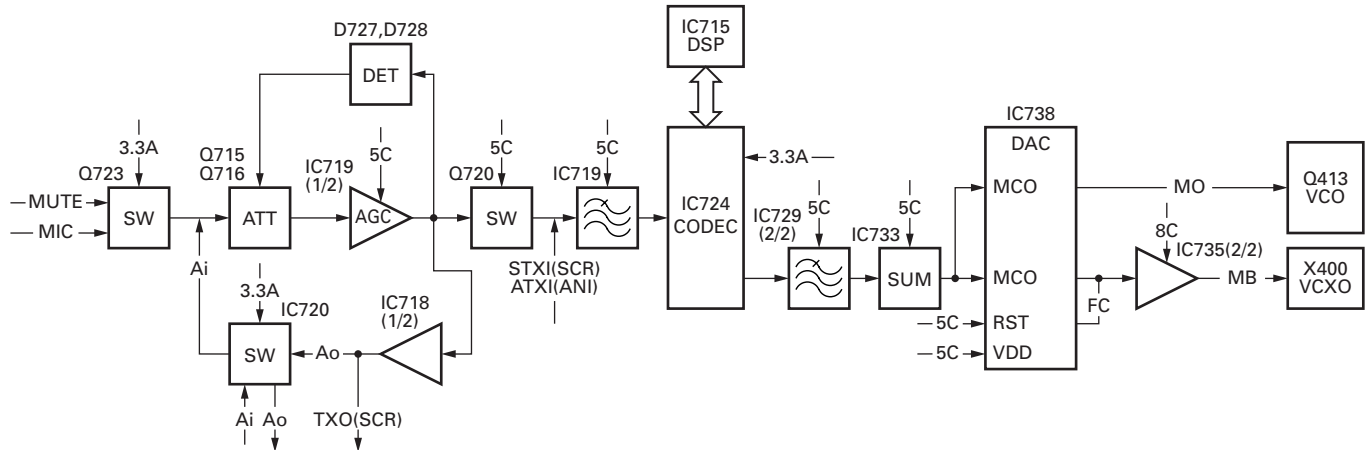


Fig. 7 Microphone, Audio band and Base band circuit

4-4. Drive Amplifier Circuit (From T/R switch to Power module)

The transmit signal passing through the T/R switch (D420) is amplified by the two drive amplifiers (Q150, Q151). The transmit signal from the drive amplifier (Q151) passes through a 3dB attenuator and is fed to the power module (IC2).

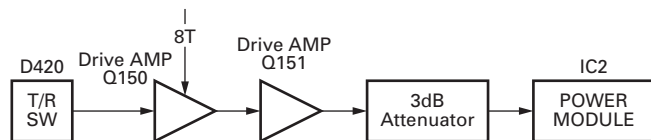


Fig. 8 Drive amplifier circuit

4-5. Final Amplifier Circuit (From Power module to Antenna output)

The transmit signal from the TX terminal (CN1) of the final unit (X45-379) is amplified by the power module (IC2).

The signal amplified by the power module passes through the CM coupler, antenna switch (D1, D12, D3 and D11) and low-pass filter, then it is fed to the antenna.

CM coupler is a line for detecting forward RF power and reflected RF power.

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 the OUT-B terminal (pin 7) of IC1 as an APC voltage. The APC voltage controls the gate voltage of the 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 (DC voltage) is fed to the APC comparator (IC1). The transmission output is reduced more as this DC voltage rises.

4-6. Automatic Power Control Circuit

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

The forward/reflected power detector circuits detect forward RF power and reflected RF power to DC voltage, and consists of a CM coupling type detection circuit formed by a CM coupler.

The voltage comparator (IC1) compares the voltage obtained by the above detected voltage with reference voltage, using the CPU (IC703), IC738 and IC735.

An APC voltage proportional to the difference between the sensed voltage and the reference voltage appears at the output of IC1. This output voltage controls the gate voltage to the final amplifier (IC2).

CIRCUIT DESCRIPTION

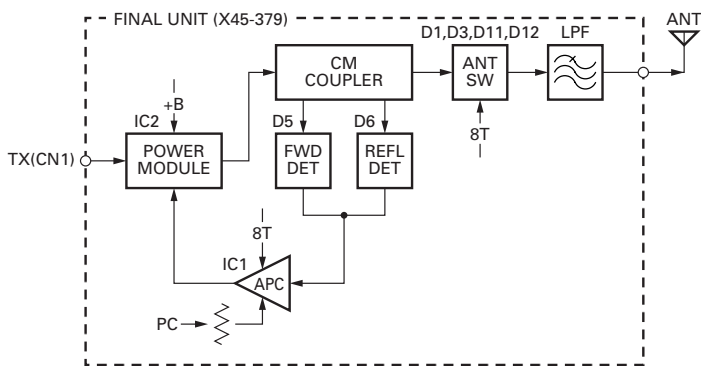


Fig. 9

Final amplifier and Automatic power control circuit

4-7. Temperature Protection Circuit

To prevent thermal destruction of the power module (IC2), this circuit reduces APC voltage when temperature of the power module (IC2) rises.

The CPU (IC703) detects temperature with a thermistor (TH1, TH4) and controls reference voltage to the APC 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 IC (IC401).

VCO (Voltage Controlled Oscillator) is provided with 2 input terminals which are controlled by the potentiometer IC and the PLL IC. The potentiometer IC brings the oscillation frequency of VCO close to the target frequency, after the PLL locks it up.

The operation frequency of PLL is from 450 to 520 MHz (K)/ 400 to 470 MHz (K2) in TX mode and from 400.05 to 470.05 MHz (K)/ 350.05 to 420.05 MHz (K2) in RX mode. The frequency steps of the PLL is 2.5, 5, 10, 12.5, 20 or 25kHz. The comparative frequency of PLL which is 5, 10, 12.5, 20 or 25 are made by a programmable reference divider in PLL IC (IC400) from the 16.8MHz reference signal of the crystal oscillator (X400). Similarly, the VCO output signal is divided into comparative frequency by the programmable N divider in the PLL IC (IC400), and is compared with the divided reference signal in its phase detector.

The output signal of the phase detector is sent to one of the input terminals of the VCO.

5-1. VCXO (X400)

VCXO (X400) generates a reference frequency of 16.8 MHz 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 VCXO with DAC (IC738). It is also controlled with pin 1 of the VCXO if the output from VCXO is modulated.

5-2. VCO

There is two RX VCOs (RX VCO 1, RX VCO 2) and a TX VCO.

The RX VCO 1 (Q415) and RX VCO 2 (Q414) generate a 1st local receive signal. The RX VCO 1 oscillation frequency is 400.05 to 435.045 MHz (K), 350.05 to 385.045 MHz (K2) and the RX VCO 2 oscillation frequency is 435.05 to 475.05 MHz (K), 385.05 to 420.05 MHz (K2).

The TX VCO (Q413) generates a transmit carrier. The TX VCO oscillation frequency is 450 to 520 MHz (K), 400 to 470 MHz (K2).

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 CPU (IC703). When the STR logic is high and the VCO1/2 logic is high, the RX VCO 1 output a 1st local receive signal. When the STR logic is high and the VCO1/2 logic is low, the RX VCO 2 output a 1st local receive signal. When the STR logic is low, the TX VCO output 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. This is used to modulate the VCO output. "MOD" works only when "STR" is low.

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 diodes (D413, D414, D408, D409, D402, and D403).

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 CPU (IC703) 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.

CIRCUIT DESCRIPTION

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 2 V.

The desired frequency is set for the PLL IC by the CPU (IC703) through the 3-line "EP", "DAT", "CLK" serial bus. Whether the PLL IC is locked or not is monitored by the CPU through the "UL" signal line. If the VCO is not the desired frequency (unlock), the "UL" logic is low.

5-6. Local Switch (D419, D420)

The connection destination of the signal output from the amplifier (Q418) 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.

If the 8T logic is high, it is connected to a transmit-side pre-drive amplifier (Q150). If the 8R logic is high, it passes through the local amplifier (Q203) and then is connected to a receive-side mixer (IC200).

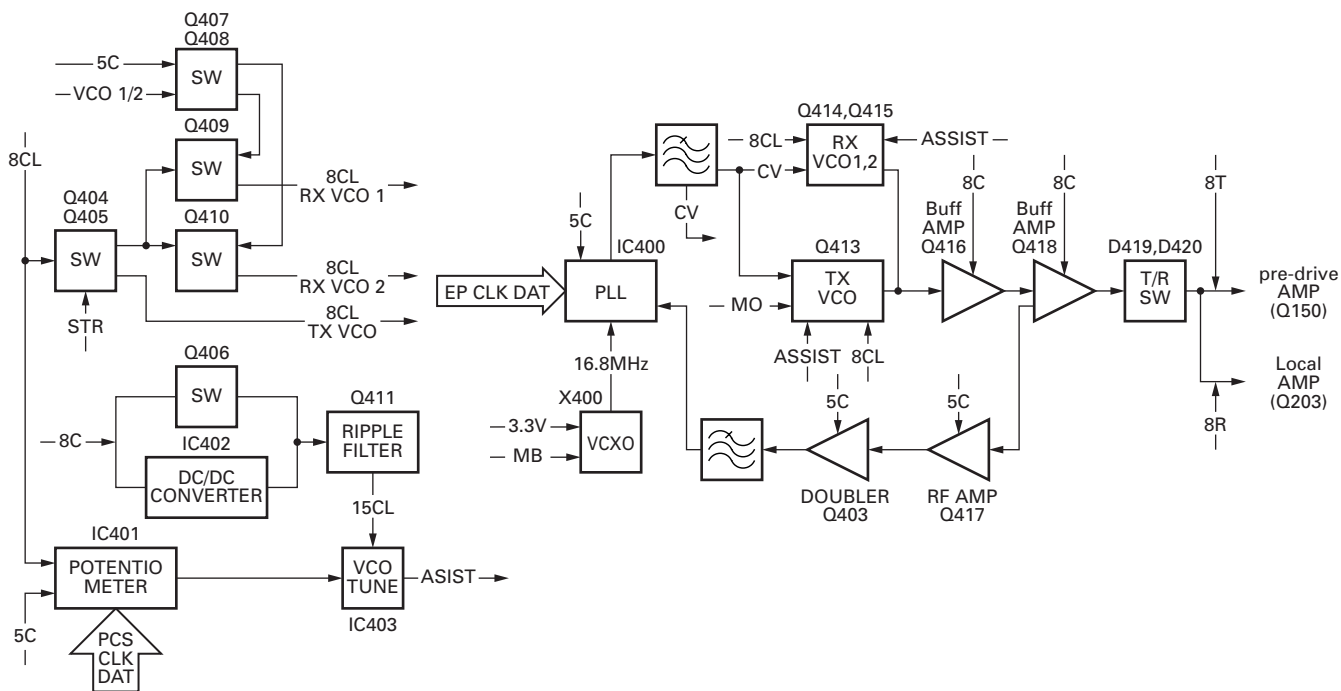


Fig. 11 PLL block diagram

6. Control Circuit

The control circuit consists of CPU (IC703) and its peripheral circuits. It controls the TX-RX unit and transfers data to the Control unit. IC703 mainly performs the following;

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

6-1. Memory Circuit

Memory circuit consists of the CPU (IC703) and a flash memory (IC712). A flash memory has a capacity of 16M bits and contains the transceiver control program for the CPU. It also stores the data for transceiver channels and operating parameter that are written by the FPU. This program can be easily written from an external devices.

The EEPROM (IC701) stores the last channel data, the scan on status, and other parameters.

Flash memory

Note : The flash memory (IC712) stores the data that is

CIRCUIT DESCRIPTION

written by the FPU (KPG-95D), and firmware program (User mode, Test mode, Tuning mode, etc.). This data must be rewritten when replacing the flash memory.

■ EEPROM

Note : The EEPROM (IC701) stores tuning data (Deviation, Squelch, etc.).

Realign the transceiver after replacing the EEPROM.

■ Real-time clock

The clock function is based on real-time clock IC (IC700).

The RTC circuit consists of RTC IC (IC700), crystal resonator (X700) and the lithium battery for backup.

It is powered by 3V from AVR (IC741).

When the power supply is off, it is backed up by an internal secondary lithium battery.

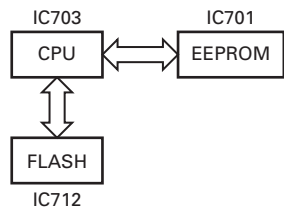


Fig. 12 Memory circuit

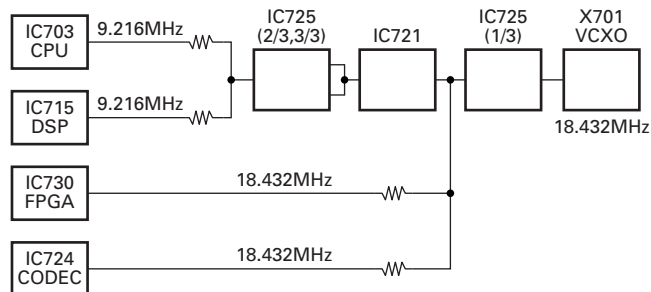


Fig. 13 Clock diagram

6-2. Temperature Detection Circuit

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

6-3. DSP

The DSP circuit consists of a DSP IC (IC715), a CODEC IC (IC724) and processes the base band signal. The DSP IC operates on an external clock of 9.216MHz (the same as the CPU), the I/O section operates at 3.3V and the core section operates at 1.5V. The DSP IC carries out the following processes:

- C4FM encoding
- Analog FM pre-emphasis/de-emphasis
- Vocoder (IMBE) processing between audio codec and modulation/ demodulation
- CAI processing, such as error correction encoding
- QT/DQT encoding/ decoding
- DTMF encoding/ decoding
- MSK encoding/ decoding

- 2-tone encoding/ decoding
- Compressor/ expander processing
- Transmit/ receive audio filtering processing
- Microphone amplifier AGC processing
- Audio mute processing
- Modulation level processing

6-4. FPGA

The FPGA IC (IC730) I/O section operates at 3.3V and the core section operates at 2.5V. The FPGA IC has the following function.

- Demodulation (C4FM,CQPSK)
- Shift register (8CH)
- Level convert Buffer amplifier(5V→3.3V)(9CH)
- Generates 1.536MHz for the demodulation and CODEC

7. Power Supply Circuit

The voltage is always applied from +B. D719 protects IC705 (DFF) against overvoltage.

Pulses from power switch are fed to the IC705 clock line and the CPU (IC703). These clock pulses reverse the output from High (The transceiver is turned OFF) to Low (The transceiver is turned ON), but it does not reverse the output from Low to High. The CPU (IC703) output the pulse to the S2 (SET2) terminal (pin 8) of IC705 to reverse the output from Low to High.

IGN is connected to the R2 (RESET2) terminal (pin 10) of IC705 and the CPU (IC703). When the IC705 reset voltage is increased, the output changes to Low (The transceiver is turned ON). When IGN voltage is decreased, the CPU (IC703) output the pulse to the S2 terminal (pin 8) of IC705 to reverse the output from Low to High after the programmed time expires (Timed power-off function).

If 24V is supplied to the transceiver by mistake, Q707 turns on, Q710 turns off, the power is forced to be turned off.

This circuit consists of IC706 (8V), IC707 (5V), IC708 (3.3V), IC710 (3.3V), IC711 (2.5V) and IC709 (1.5V).

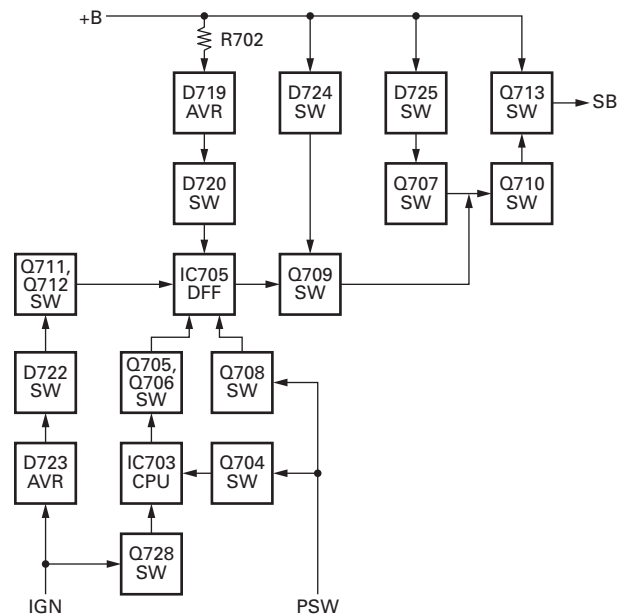


Fig. 14 Power supply circuit

CIRCUIT DESCRIPTION

8. Signaling Circuit

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

Each signaling data signal of QT, DQT, DTMF, 2-tone and MSK is generated by the DSP circuit, superposed on a modulation signal and output from pin 16 of the CODEC IC (IC724).

The modulation balance of the QT/DQT signal is adjusted by the D/A converter(IC738) and the resulting signal is routed to the modulation input of the VCO and VCXO (X400).

The each deviation of the TX QT, DQT, DTMF, 2-tone and MSK tone is adjusted by changing the output level of the CODEC IC and the resulting signal is routed to VCO and VCXO. The RX DTMF tone is output from pin 15 of the CODEC IC, passes through the receive audio signal system, and is output from the speaker.

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

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

9. Compander Circuit

The term "compander" means compressor and expander. The compander reduces noise by utilizing a compressor and an expander.

The transceiver contains DSP IC (IC715) to perform this operation. The transceiver compander can be turned on or off using the FPU.

SEMICONDUCTOR DATA

CPU:30625MGP347GU (Control unit IC703)

Pin No.	Port Name	I/O	Function
1	VREF	–	A/D converter reference voltage input terminal
2	AVCC	–	A/D converter power supply input terminal
3	PLAY	I	Play input (for VGS) (H: Playing)
4	EI	O	Enable output for shift register of KRK
5	KCS	O	Chip select output for D/A converter of KRK
6	NC	–	No connection
7	VOICE	O(D/A)	Voice output of built-in voice guide
8	SOE	O	Shift register output enable
9	UL	I	PLL unlock (L:Unlock, H:Lock)
10	DAT	O	Common data
11	CLK	O	Common clock
12	SDA	I/O	EEPROM data
13	BYTE	I	Use as 8bit data bus (Vcc)
14	CNVSS	I	Use as memory expansion mode (Vss)
15	PCS	O	Potentiometer CS
16	XOUT	–	No connection
17	RESET	I	Reset input
18	XOUT	–	No connection
19	VSS	–	GND
20	XIN	–	Clock input, 9.216MHz (18.432MHz/2)
21	VCC1	–	Power supply input (5V)
22	NC (NMI)	I	NC
23	RXD INT	I(INT2)	RXD interrupt input (L:Interrupt)
24	PSW (INT1)	I(INT1)	Power switch detection (L:Power off, H:Power on)
25	INTRA	I(INT0)	RTC interrupt input (L:Interrupt)
26	LD	O	DAC LD
27	BEEP	O	BEEP output
28	EP	O	PLL CS
29	AUX I/O 1	I/O	Auxiliary I/O 1 (FPU selectable)
30	AUX I/O 2	I/O	Auxiliary I/O 2 (FPU selectable)
31	STRB1	O	Shift register 1 CS
32	AUX I/O 3	I/O	Auxiliary I/O 3 (FPU selectable)
33	AUX I/O 4	I/O	Auxiliary I/O 4 (FPU selectable)
34	RXD2	I	to Display
35	TXD2	O	to Display
36	TXD1	O	to D-SUB 25pin (VGS)
37	VCC1	–	Power supply input (5V)
38	RXD1	I	to D-SUB 25pin (VGS)
39	VSS	–	GND
40	VBUSY	I	Busy input (for VGS) (H:Busy)
41	AUX I/O 5	I/O	Auxiliary I/O 5 (FPU selectable)
42	TXD0	O	to D-SUB 25pin (232C level)
43	RXD0	I	to D-SUB 25pin (232C level)
44	AUX I/O 6	I/O	Auxiliary I/O 6 (FPU selectable)
45	AUX I/O 7	I/O	Auxiliary I/O 7 (FPU selectable)
46	MM	O	MIC mute output (L:Unmute, H:Mute)
47	SBC	O	Power control output (L:Power on, H:Power off)

Pin No.	Port Name	I/O	Function
48	DS	O	Dual band switch
49	SELF	I	Self programming mode (L:Enable, H:Disable)
50	RDY	I	Bus control (Ready)
51	ALE	–	No connection
52	HOLD	I	Bus control (Hold)
53	HLDA	–	No connection
54	STRB	O	Shift register strobe of FPGA
55,56	NC	–	No connection
57	SCSW	O	When the scramble board is installed, the route of AF is change. (L:Scrambler on, H:off)
58	BCLK	O	Bus control (Base clock output)
59	RD	O	Bus control (Read)
60	BHE	–	No connection
61	WR	O	Bus control (Write)
62	NC	–	No connection
63	AUXO 1	O	Auxiliary output 1 (FPU selectable)
64	AUXO 2	O	Auxiliary output 2 (FPU selectable)
65	CHECK	I	for port check
66	CS2	O	Flash memory CS
67	CS1	O	DSP CS
68	CS0	O	Flash memory CS
69~79	A19~A9	O	Address bus 19~9
80	AM	O	AF mute (L:Unmute, H:Mute)
81	TCNT	I	Tone control input (for ANI board)
82	KEY	I	TX key input (for ANI board)
83	INH	I	Audio inhibit input (for ANI board)
84	BEEPS	O	Beep mute switch (L:Unmute, H:Mute)
85	VCC2	–	Power supply input (3.3V)
86	A8	O	Address bus 8
87	VSS	–	GND
88~95	A7~A0	O	Address bus 7~0
96	A20	O	Address bus 20
97	HINT	I(INT4)	DSP HINT interrupt (L:Interrupt)
98	NC	–	No connection
99	1/2	I	Deak 1/2 L:Deak 1 (default), H:Deak 2 (Modification:Pd→Pu)
100	IGN	I	Ignition sense (L:Ignition on, H:Ignition off)
101	DRST	O	DSP reset output (L:Reset)
102	FRST	O	Flash memory reset output (L:Reset)
103	NC	O	No connection
104~111	D7~D0	I/O	Data bus 7~0
112	STRB2	O	Shift register 2 CS
113	TAMS	O	TX audio monitor switch (L:Disconnect, H:Connect)
114	AUX I/O 8	I/O	Auxiliary I/O 8 (FPU selectable)
115	LOK	I/O	for LOK customize
116	RTCDT	I/O	RTC data I/O
117	AUX I/O 9	I/O	Auxiliary I/O 9 (FPU selectable)
118	STRB3	O	Shift register 3 CS
119	PTOS	O	for K-USA customize

SEMICONDUCTOR DATA

Pin No.	Port Name	I/O	Function
120	FTEMP1	I(A/D)	Temperature compensation 1 input
121	ASQL	I(A/D)	Analog squelch input
122	CV	I(A/D)	VCO CV input
123	RSSI	I(A/D)	RSSI input
124	TEMP	I(A/D)	Temperature Input
125	BATT	I(A/D)	Battery level input
126	FTEMP2	I(A/D)	Temperature compensation 2 input
127	AVSS	-	A/D converter power supply input terminal
128	AUX I/O	I/O	AUX input/ouput (for ANI board)

Shift Register:BU4094BCFV (Control unit IC728)

Pin No.	Port Name	I/O	Function
1	STRB1	I	Latch clock input (Rising edge)
2	DAT	I	Serial data input
3	CLK	I	Serial clock input (Rising edge)
4	C	O	External MIC mute (L:Mute, H:Unmute)
5	B	O	External data line mute (L:Mute, H:Unmute)
6	A	O	INT SP/EXT SP switching (L:Normal SP, H:PA SP)
7	HR	O	Horn alert (L:Relay off, H:Relay on)
8	VSS	-	GND
9,10	NC	O	No connection
11	PTOS	O	PTT output for scrambler board (L:PTT on, H:PTT off)
12	EN	O	VGS enable (L:Enable Low, H: Enable High)
13	USEL	O	VGS USEL (L:19200bps, H:115200bps)
14	VRST	O	VGS reset (L:Reset Low, H:Reset High)
15	SOE	I	Output enable control input
16	VDD	-	Power supply input (5V)

Shift Register:BU4094BCFV (Control unit IC717)

Pin No.	Port Name	I/O	Function
1	STRB2	I	Latch clock input (Rising edge)
2	DAT	I	Serial data input
3	CLK	I	Serial clock input (Rising edge)
4~7	BC1~BC4	O	Scrambler code 1~4 (L:Off, H:On)
8	VSS	-	GND
9,10	NC	O	No connection
11	AC	O	Scrambler on/off (L:On, H:Off)
12	BUSY	O	Channel busy (L:Busy, H:Not busy)
13	EMG	O	Emergency on/off (L:On H:Off)
14	PTOA	O	PTT output for ANI board (L:PTT on, H:PTT off)
15	SOE	I	Output enable control input
16	VDD	-	Power supply input (5V)

Shift Register:BU4094BCFV (TX-RX unit IC600)

Pin No.	Port Name	I/O	Function
1	STRB3	I	Latch clock input (Rising edge)
2	DAT	I	Serial data input
3	CLK	I	Serial clock input (Rising edge)
4	VCO 1/2	O	VCO 1/ VCO 2 switching (L:VCO 2, H:VCO 1)
5	STR	O	TX VCO/RX VCO switching (L:TX, H:RX)
6	8RC	O	8R control (L:Off, H:On)
7	8TC	O	8T control (L:Off, H:On)
8	VSS	-	GND
9,10	NC	O	No connection
11	WN1	O	CF 1st stage W/N switching (Wide H:WN1, H:WN2, H:VN)
12	WN2	O	CF 2nd stage W/N switching (Narrow L:WN1, L:WN2, H:VN)
13	VN	O	CF 2nd stage W or N/VN switching (P25 H:WN1, L:WN2, L:VN)
14	NC	O	No connection
15	SOE	I	Output enable control input
16	VDD	-	Power supply input (5V)

D/A Converter : M62364FP-F (Control unit IC738)

Pin No.	Port Name	I/O	Function
1	VIN1	I	RX AF input 1
2	VOUT1	O	RX AF output 1
3	VOUT2	O	RX AF output 2
4	VIN2	I	RX AF input 2
5	VDD	-	5V (5C)
6	LD	I	LD
7	CLK	I	Serial clock input
8	DI	I	Serial data input
9	VIN3	I	GND
10	VOUT3	O	BPF tuning
11	VOUT4	O	2nd local tuning
12	VIN4	I	GND
13	VIN5	I	TX modulation input
14	VOUT5	O	TX modulation output
15	VOUT6	O	Balance adjust
16	VIN6	I	TX modulation input
17	DO	-	No connection
18	VDAREf	-	2V (VREF)
19	RESET	-	5V (5C)
20	GND	-	GND
21	VIN7	I	3.3V (33A)
22	VOUT7	O	Frequency control
23	VOUT8	O	APC
24	VIN8	I	5V (5C)

COMPONENTS DESCRIPTION

Control unit (X53-4120-10)

Ref. No.	Part name	Description
IC700	IC	RTC IC
IC701	IC	EEPROM
IC702	IC	Temperature DET
IC703	IC	CPU
IC704	IC	Reset IC
IC705	IC	D-type flip flop
IC706	IC	Voltage regulator (8C)
IC707	IC	Voltage regulator (5C)
IC708	IC	Voltage regulator (33A)
IC709	IC	Voltage regulator (15D)
IC710	IC	Voltage regulator (33M)
IC711	IC	Voltage regulator (25D)
IC712	IC	Flash ROM
IC713	IC	Address decoder
IC714	IC	OP AMP (DEO)
IC715	IC	DSP
IC716	IC	Voltage regulator (5V)
IC717	IC	Shift register
IC718	IC	OP AMP (VREF)
IC719	IC	OP AMP (MIC AMP)
IC720	IC	Analog switch (VGS)
IC721	IC	Clock divider
IC722	IC	Level converter
IC723	IC	OP AMP (RX AF)
IC724	IC	CODEC
IC725,726	IC	Clock buffer
IC727	IC	Analog switch
IC728	IC	Shift register
IC729	IC	OP AMP (MOD/RX AF)
IC730	IC	FPGA
IC731	IC	Analog switch (Scrambler)
IC732	IC	Audio power AMP
IC733	IC	OP AMP (MOD)
IC734	IC	Analog switch (TAMS)
IC735	IC	OP AMP (PC/MB)
IC736	IC	Analog switch (VGS)
IC737	IC	OP AMP (2nd Lo Tune)
IC738	IC	D/A converter
IC739	IC	OP AMP (RX audio)
IC740	IC	OP AMP (Front end tune)
IC741	IC	Voltage regulator (RTC5V)
IC742	IC	OP AMP (Summing AMP)
IC743	IC	Analog switch (DS)
IC745	IC	Buffer AMP (AFO)
IC950	IC	Bus switch
IC951	IC	Buffer AMP (DI)
IC952	IC	Voltage regulator (RTC)
Q700	Transistor	Buffer (AUXO1)
Q701	Transistor	Buffer (AUXO2)
Q702	Transistor	Buffer (TXD2)
Q703	Transistor	Buffer (TXD2)
Q704	FET	DC switch (PSW)

Ref. No.	Part name	Description
Q705	Transistor	DC switch (SBC)
Q706	Transistor	DC switch (SBC)
Q707	Transistor	DC switch (SBC)
Q708	Transistor	DC switch (PSW)
Q709	Transistor	DC switch (SBC)
Q710	Transistor	DC switch (SBC)
Q711	Transistor	DC switch (IGN)
Q712	Transistor	DC switch (IGN)
Q713	FET	DC switch (SB)
Q714	Transistor	Buffer (RXD3)
Q715,716	Transistor	Auto gain control
Q717	Transistor	Buffer (RXD3)
Q719	FET	DC switch (VATS)
Q720	FET	Analog switch (Scrambler)
Q721	FET	DC switch (Scrambler)
Q723	FET	Analog switch (MIC/MIC2)
Q725	FET	DC switch (Beat Shift)
Q728	Transistor	DC switch (IGN)
Q729	FET	RX audio mute switch
Q730	Transistor	DC switch (HR)
Q731	Transistor	RX audio mute switch
Q732	Transistor	RX audio mute switch
Q733	FET	DC switch (VARS)
Q734	FET	DC switch (DS)
Q735	FET	DC switch (BEEPS)
Q736	FET	DC switch (SCSW)
Q950,951	Transistor	Buffer (D_TXD)
D650~653	Diode	Reverse current prevention
D700~706	Diode	Voltage protection
D707	Zener diode	Voltage protection
D708,709	Diode	Voltage protection
D710	Zener diode	Voltage protection
D711,712	Diode	Voltage protection
D713,714	Zener diode	Voltage protection
D715~717	Diode	Reverse current prevention
D719	Zener diode	Voltage regulator (5V)
D720	Diode	Reverse current prevention
D721	Zener diode	Voltage protection
D722	Diode	Reverse current prevention
D723	Zener diode	Voltage protection
D724	Diode	Reverse current prevention
D725	Zener diode	Voltage detection
D726	Diode	Voltage protection
D727,728	Diode	TX AGC detection
D731,732	Zener diode	Voltage protection
D734	Diode	Surge absorption
D735	Zener diode	Voltage protection
D736	Varistor	Surge absorption
D737	Zener diode	Voltage protection
D738~742	Varistor	Surge absorption
D743~748	Diode	Voltage protection
D749,750	Diode	DC switch
D751	Diode	Voltage protection

TK-5810(B)

COMPONENTS DESCRIPTION

TX-RX unit (X57-7270-XX)

Ref. No.	Part name	Description
IC200	IC	DBM
IC201~203	IC	Multiplexer
IC204	IC	OP AMP
IC205~207	IC	Multiplexer
IC209	IC	FM IC
IC210	IC	Buffer
IC211	IC	Multiplexer
IC400	IC	PLL IC
IC401	IC	Potentiometer
IC402	IC	DC/DC
IC403	IC	VCO Tune
IC600	IC	Shift register
IC601	IC	Voltage regulator (5V)
Q150,151,200	Transistor	RF AMP
Q201,202	Transistor	DC switch
Q203	Transistor	Local AMP
Q204,205	Transistor	IF AMP
Q207	Transistor	VCXO frequency AMP
Q208,209	Transistor	DC switch
Q210	FET	DC switch
Q211	Transistor	Noise AMP
Q400	FET	CV detection
Q401,402	Transistor	UL detection
Q403	Transistor	PLL Fin AMP
Q404	Transistor	TX/RX switch
Q405	FET	TX/RX switch
Q406	FET	DC/DC
Q407	Transistor	VCO1/2 switch
Q408	FET	VCO1/2 switch
Q409,410	Transistor	VCO1/2 switch
Q411,412	Transistor	Ripple filter
Q413~415	FET	VCO oscillator
Q416	Transistor	Buffer AMP
Q417	Transistor	PLL Fin AMP
Q418	Transistor	Buffer AMP
Q600,601	Transistor	8T switch
Q602,603	Transistor	8R switch
D200~203	Variable capacitance diode	HPF control
D204~207	Variable capacitance diode	BPF control
D208~217	Diode	IF filter switch
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
D416,417	Variable capacitance diode	VCO control
D418	Variable capacitance diode	Modulation
D419,420	Diode	TX/RX switch
D421,422	Variable capacitance diode	VCO control

Final unit (X45-3790-XX)

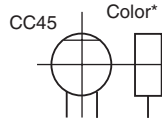
Ref. No.	Part name	Description
IC1	IC	APC comparator
IC2	IC	Power module
D1	Diode	ANT switch
D2	Zener diode	Protect of voltage
D3	Diode	ANT switch
D5	Diode	Forward wave rectification
D6	Diode	Reflected wave rectification
D10	Diode	Combiner
D11	Diode	ANT switch
D12	Diode	ANT switch
D13	Surge absorber	Surge absorption
D14	Diode	Protect of reverse connection

PARTS LIST

CAPACITORS

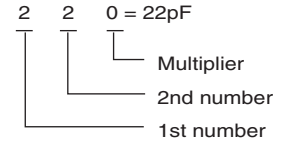
CC 45 TH 1H 220 J
 1 2 3 4 5 6

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



Capacitor value

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



Temperature coefficient

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

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

Example : CC45TH = -470 ± 60ppm/°C

Tolerance (More than 10pF)

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

(Less than 10pF)

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

Voltage rating

2nd word \ 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	-

Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
 1 2 3 4 5 6 7

(Chip)(CH,RH,UJ,SL)

Refer to the table above.

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

(EX) C K 7 3 F F 1 H 0 0 0 Z
 1 2 3 4 5 6 7

(Chip)(B,F)

Dimension (Chip capacitors)

Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.0 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0
H	1.0 ± 0.05	0.5 ± 0.05	0.5 ± 0.05

RESISTORS

Chip resistor (Carbon)

(EX) R D 7 3 E B 2 B 0 0 0 J
 1 2 3 4 5 6 7

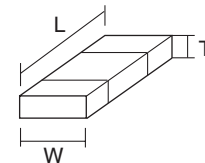
(Chip)(B,F)

Carbon resistor (Normal type)

(EX) R D 1 4 B B 2 C 0 0 0 J
 1 2 3 4 5 6 7

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

Dimension



Dimension (Chip resistor)

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

Rating wattage

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

TK-5810(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 K: USA P: Canada
 Y: PX (Far East, Hawaii) T: England E: Europe
 Y: AAFES (Europe) X: Australia M: Other Areas

TK-5810(B) (Y51-5110-XX) FINAL UNIT (X45-3790-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
TK-5810(B)						C18			CK73GB1C104K	CHIP C 0.10UF K	
1	3A		A01-2161-22	METALLIC CABINET(TOP)		C19			CK73GB1C683K	CHIP C 0.068UF K	K
2	1B	*	A01-2162-32	METALLIC CABINET(BOTTOM)		C19			CK73GB1H153K	CHIP C 0.015UF K	K2
6	2B		A10-1388-51	CHASSIS		C20			CM73F2H820J	CHIP C 82PF J	
10	2C	*	B62-1938-00	INSTRUCTION MANUAL		C21			CK73GB1H471K	CHIP C 470PF K	
14	2B		E04-0167-05	RF COAXIAL RECEPTACLE(M)		C22			CM73F2H060D	CHIP C 6.0PF D	
16	1C		E37-0733-05	SHORT PLUG(SP) ACCESSORY		C23			CM73F2H050D	CHIP C 5.0PF D	
17	2B		E37-0772-25	LEAD WIRE WITH CONNECTOR(D-SUB)		C24			CM73F2H060D	CHIP C 6.0PF D	K
18	1A,3A		E37-1147-05	FLAT CABLE(X53:CN782-X57:CN600)		C24			CM73F2H070D	CHIP C 7.0PF D	K2
19	1B	*	E37-1149-25	LEAD WIRE WITH CONNECTOR(DC2P/ACC9P)		C25			CK73GB1H471K	CHIP C 470PF K	
21	1A,2A		E37-1153-05	FLAT CABLE(X45:CN9-X57:CN601)		C27			CC73FCH1H050C	CHIP C 5.0PF C	K
25	2B		F10-1479-03	SHIELDING PLATE(FINAL:X45)		C27			CC73FCH1H220J	CHIP C 22PF J	K2
27	1A		F10-2265-13	SHIELDING COVER(VCO, TX-RX:X57)		C34			CC73GCH1H181J	CHIP C 180PF J	
28	3B		F10-3012-04	SHIELDING PLATE(CONTROL:X53)		C37			CC73FCH1H050C	CHIP C 5.0PF C	K
33	3A		G02-0599-04	FLAT SPRING(AVR)		C37			CC73FCH1H080D	CHIP C 8.0PF D	K2
34	3A		G02-0709-04	FLAT SPRING(AUDIO AMP)		C40, 41			CK73FB1H471K	CHIP C 470PF K	
35	1A	*	G02-1833-03	EARTH SPRING(POWER MODULE)	K	C42			CM73F2H060D	CHIP C 6.0PF D	K
36	1B		G10-1327-04	FIBROUS SHEET		C42			CM73F2H070D	CHIP C 7.0PF D	K2
37	2A,2B,1C		G11-4379-04	SHEET ACCESSORY		C46			CM73F2H070D	CHIP C 7.0PF D	
38	1A	*	G13-2182-04	CUSHION(X57 SHIELDING PLATE)		C47, 48			CK73FB1H471K	CHIP C 470PF K	
39	1B	*	G13-2195-14	CUSHION(BOTTOM CABINET)		C49, 50	*		C92-0891-05	ELECTRO 330UF 25WV	
40	2B	*	G13-2196-04	CUSHION(X45 SHIELDING PLATE)		C52, 53			CK73GB1H471K	CHIP C 470PF K	
41	2B		G53-1626-03	PACKING(D-SUB CAP)		C55			CM73F2H050D	CHIP C 5.0PF D	
42	2B		G53-1657-04	PACKING(ANT)		C56			CK73GB1H152J	CHIP C 1500PF J	
43	2B		G53-1658-04	PACKING(DC/ACC)		C58, 59			CK73GB1H471K	CHIP C 470PF K	
45	3A		G53-1665-12	PACKING(TOP)		C61			CM73F2H101J	CHIP C 100PF J	
46	1B		G53-1666-12	PACKING(BOTTOM)		C62, 63			CK73GB1H471K	CHIP C 470PF K	
49	2B		G53-1687-04	PACKING(D-SUB)		C65			CK73GB1H471K	CHIP C 470PF K	K
50	1C		H02-0626-04	INNER CARTON CASE		CN1, 2			E04-0154-05	PIN SOCKET	
51	2C		H12-3176-02	PACKING FIXTURE(HEAD-SPACE)		CN9			E40-6429-05	FLAT CABLE CONNECTOR	
52	2C,3C		H12-3183-02	PACKING FIXTURE(TOP,BOTTOM)		CN10			E23-1118-05	TERMINAL	
57	3C	*	H52-2128-02	ITEM CARTON CASE		CN13			E41-2672-05	PIN ASSY	
62	1B,3A		J39-0651-05	SPACER(TOP,BOTTOM CABINET)		CN14	*		E23-1290-05	RELAY TERMINAL	
A	2B		N09-2292-05	HEXAGON HEAD SCREW(D-SUB)		W2			E37-1325-05	LEAD WIRE WITH CONNECTOR	
B	1B,3A		N32-3008-43	FLAT HEAD MACHINE SCREW(CABINET)		L2			L34-4523-05	AIR-CORE COIL	
D	1A		N35-3006-48	BINDING HEAD MACHINE SCREW(DC TERMINAL)		L3 -5			L34-4517-05	AIR-CORE COIL	
E	1A		N67-3008-48	PAN HEAD SEMS SCREW(POWER MODULE)		L8			L34-4517-05	AIR-CORE COIL	
F	1A		N68-4006-48	PAN HEAD SEMS SCREW(DC TERMINAL)		L10			L34-4523-05	AIR-CORE COIL	
H	1A,2A, 2B,3B		N87-2606-48	BRAZIER HEAD TAPTITE SCREW(PCB)		L11			L40-1575-92	SMALL FIXED INDUCTOR(15NH)	K
I	1A		N87-2612-48	BRAZIER HEAD TAPTITE SCREW(SHIELD)		R1			RK73FB2B471J	CHIP R 470 J 1/8W	K2
J	1B,2B		N87-3008-48	BRAZIER HEAD TAPTITE SCREW(DC/ACC,ANT)		R1			RK73FB2B821J	CHIP R 820 J 1/8W	K
63	1C		N99-2051-05	SCREW SET ACCESSORY		R2, 3			RK73FB2B100J	CHIP R 10 J 1/8W	K
65	3B		W09-0971-05	LITHIUM CELL(X53)		R2, 3			RK73FB2B180J	CHIP R 18 J 1/8W	K2
FINAL UNIT (X45-3790-XX) -10:K -11:K2						R4			RK73FB2B471J	CHIP R 470 J 1/8W	K2
C5, 6		*	CK73GB1H471K	CHIP C 470PF K		R4			RK73FB2B821J	CHIP R 820 J 1/8W	K
C8			C92-0891-05	ELECTRO 330UF 25WV		R6			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C11 -13		*	CK73GB1H471K	CHIP C 470PF K		R7			RK73GB2A101J	CHIP R 100 J 1/10W	
C15, 16			CK73GB1H471K	CHIP C 470PF K	K2	R9			RK73PB2H101J	CHIP R 100 J 1/2W	
C16			CK73GB1H471K	CHIP C 470PF K	K	R11			RK73GB2A224J	CHIP R 220K J 1/10W	K2
C17			CC73GCH1H030C	CHIP C 3.0PF C	K2	R11			RK73GB2A473J	CHIP R 47K J 1/10W	K
C17			CC73GCH1H050C	CHIP C 5.0PF C	K	R12			RK73GB2A101J	CHIP R 100 J 1/10W	
						R13			RK73GB2A153J	CHIP R 15K J 1/10W	K
						R13			RK73GB2A183J	CHIP R 18K J 1/10W	K2
						R14			RK73GB2A394J	CHIP R 390K J 1/10W	

PARTS LIST

FINAL UNIT (X45-3790-XX)
CONTROL UNIT (X53-4120-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R15			RK73GB2A103J	CHIP R 10K J 1/10W		C669			CK73GB0J105K	CHIP C 1.0UF K	
R16			RK73GB2A224J	CHIP R 220K J 1/10W		C670			CK73GB1H102K	CHIP C 1000PF K	
R17			RK73GB2A104J	CHIP R 100K J 1/10W		C700			CK73GB1H102K	CHIP C 1000PF K	
R18			RK73FB2B181J	CHIP R 180 J 1/8W	K2	C701			CK73GB1C473K	CHIP C 0.047UF K	
R18			RK73FB2B820J	CHIP R 82 J 1/8W	K	C702			CK73GB1H471K	CHIP C 470PF K	
R19			RK73PB2H330J	CHIP R 33 J 1/2W	K2	C703			CC73GCH1H101J	CHIP C 100PF J	
R19			RK73PB2H560J	CHIP R 56 J 1/2W	K	C704			CK73GB1C473K	CHIP C 0.047UF K	
R22			RK73GB2A104J	CHIP R 100K J 1/10W		C705			CK73GB1C104K	CHIP C 0.10UF K	
R23			RK73PB2H560J	CHIP R 56 J 1/2W	K2	C706			CK73GB1C473K	CHIP C 0.047UF K	
R23		*	RK73PB2H680J	CHIP R 68 J 1/2W	K	C707			CK73FB1E474K	CHIP C 0.47UF K	
R27			RK73GB2A102J	CHIP R 1.0K J 1/10W		C708			CK73GB1H471K	CHIP C 470PF K	
R28			RK73FB2B102J	CHIP R 1.0K J 1/8W	K2	C710			CK73GB1C473K	CHIP C 0.047UF K	
R28			RK73FB2B331J	CHIP R 330 J 1/8W	K	C711			CK73GB1C104K	CHIP C 0.10UF K	
R29			RK73GB2A000J	CHIP R 0.0 J 1/10W		C712			CK73GB1A105K	CHIP C 1.0UF K	
R30			RK73GB2A334J	CHIP R 330K J 1/10W		C713			CK73FBOJ106K	CHIP C 10UF K	
R32			RK73GB2A102J	CHIP R 1.0K J 1/10W		C714,715			CK73GB1A105K	CHIP C 1.0UF K	
R34			RK73GB2A104J	CHIP R 100K J 1/10W		C716,717			CK73GB1C104K	CHIP C 0.10UF K	
R41			RK73PB2H101J	CHIP R 100 J 1/2W		C718-721			CC73GCH1H101J	CHIP C 100PF J	
R42			RK73GB2A473J	CHIP R 47K J 1/10W		C722-732			CK73GB1H102K	CHIP C 1000PF K	
R44			RK73GB2A000J	CHIP R 0.0 J 1/10W		C733			CC73GCH1H101J	CHIP C 100PF J	
R47			RK73GB2A000J	CHIP R 0.0 J 1/10W		C734			CK73GB1H102K	CHIP C 1000PF K	
VR1			R32-0328-05	SEMI FIXED VARIABLE RESISTOR(10K)		C735			CC73GCH1H101J	CHIP C 100PF J	
D1			MA4PH633	DIODE		C736			CK73GB1H102K	CHIP C 1000PF K	
D2			UDZS6.2B	ZENER DIODE		C737-741			CC73GCH1H101J	CHIP C 100PF J	
D3			MA4PH633	DIODE		C743-745			CC73GCH1H101J	CHIP C 100PF J	
D5 ,6			HSM88AS-E	DIODE		C746-748			CK73GB1C104K	CHIP C 0.10UF K	
D10			MA2S111-F	DIODE		C749			CK73GB1H102K	CHIP C 1000PF K	
D11 ,12			MA4PH633	DIODE		C751			CK73GB1H472K	CHIP C 4700PF K	
D13			ZSH5MA27	SURGE ABSORBER		C753			CK73HB1A104K	CHIP C 0.10UF K	
D14			DF25V60	DIODE		C754			CK73HB1H102K	CHIP C 1000PF K	
IC1			TA75W01FUF	MOS-IC		C756			CK73HB1A104K	CHIP C 0.10UF K	
IC2		*	RA60H40471101	MOS-IC	K2	C757		*	CS77CA1D4R7M	CHIP TNL 4.7UF 20WV	
IC2		*	RA60H44521101	MOS-IC	K	C758			CK73HB1A104K	CHIP C 0.10UF K	
TH1			S1R103J440H	THERMISTOR		C759,760			CK73GB1H471K	CHIP C 470PF K	
TH4			S1R103J440H	THERMISTOR		C761			CK73HB1A104K	CHIP C 0.10UF K	
CONTROL UNIT (X53-4120-10)											
C601			CK73HB1A104K	CHIP C 0.10UF K		C770			CK73GB1H102K	CHIP C 1000PF K	
C603			CK73HB1A104K	CHIP C 0.10UF K		C771			CS77CPOJ100M	CHIP TNL 10UF 6.3WV	
C605			CK73HB1C103K	CHIP C 0.010UF K		C772,773			CK73HB1C103K	CHIP C 0.010UF K	
C608			CK73HB1A104K	CHIP C 0.10UF K		C775			CK73HB1C103K	CHIP C 0.010UF K	
C610			CK73GB0J105K	CHIP C 1.0UF K		C776			CS77CPOJ100M	CHIP TNL 10UF 6.3WV	
C611			CC73GCH1H101J	CHIP C 100PF J		C778			CK73HB1C103K	CHIP C 0.010UF K	
C613		*	C92-0891-05	ELECTRO 330UF 25WV		C780,781			CK73HB1C103K	CHIP C 0.010UF K	
C614,615			CK73FBOJ106K	CHIP C 10UF K		C783,784			CK73HB1C103K	CHIP C 0.010UF K	
C621			CK73FBOJ106K	CHIP C 10UF K		C785			CK73GB1C104K	CHIP C 0.10UF K	
C651			CC73GCH1H220J	CHIP C 22PF J		C786			CK73GB0J105K	CHIP C 1.0UF K	
C652,653			CK73GB1E105K	CHIP C 1.0UF K		C787			CC73GCH1H101J	CHIP C 100PF J	
C654			CK73GB1C104K	CHIP C 0.10UF K		C788			CK73GB1H103K	CHIP C 0.010UF K	
C655			CC73GCH1H470J	CHIP C 47PF J		C789,790			CS77AA1A100M	CHIP TNL 10UF 10WV	
C656-660			CK73GB1H102K	CHIP C 1000PF K		C791			CC73GCH1H220J	CHIP C 22PF J	
C661			CK73GB1C104K	CHIP C 0.10UF K		C792			CK73GB1C104K	CHIP C 0.10UF K	
C662			CC73GCH1H470J	CHIP C 47PF J		C793,794			CS77AP1C1R5M	CHIP TNL 1.5UF 16WV	
C663			CK73GB1C104K	CHIP C 0.10UF K		C795,796			CK73GB1C104K	CHIP C 0.10UF K	
C664			CK73GB0J475K	CHIP C 4.7UF K		C797			CC73GCH1H101J	CHIP C 100PF J	
C665			CK73GB1H103K	CHIP C 0.010UF K		C798			CK73GB0J105K	CHIP C 1.0UF K	
C667,668			CK73GB1C104K	CHIP C 0.10UF K		C799			CK73FBOJ106K	CHIP C 10UF K	

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

TK-5810(B)

PARTS LIST

CONTROL UNIT (X53-4120-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C800,801			CK73GB1C104K	CHIP C 0.10UF K		C916-919			CC73HCH1H330J	CHIP C 33PF J	
C802,803			CK73GB0J475K	CHIP C 4.7UF K		C921,922			CK73GB0J475K	CHIP C 4.7UF K	
C804,805			CK73GB1C104K	CHIP C 0.10UF K		C930			CK73GB1C104K	CHIP C 0.10UF K	
C808			CK73GB1H103K	CHIP C 0.010UF K		C931-938			CK73GB1H471K	CHIP C 470PF K	
C809			CK73GB1C104K	CHIP C 0.10UF K		C941			CK73HB1H471K	CHIP C 470PF K	
C810			CK73GB1H471K	CHIP C 470PF K		C942-954			CK73GB1H471K	CHIP C 470PF K	
C811			CK73GB1C104K	CHIP C 0.10UF K		C956-961			CK73GB1H471K	CHIP C 470PF K	
C812			CK73GB1H471K	CHIP C 470PF K		C995			CK73FBOJ106K	CHIP C 10UF K	
C814			CS77AAQJ220M	CHIP TNL 22UF 6.3VWV		C996			CK73GB1C104K	CHIP C 0.10UF K	
C815			CK73GB0J105K	CHIP C 1.0UF K		C997			CK73GB1H471K	CHIP C 470PF K	
C818			CK73FBOJ106K	CHIP C 10UF K		C998			CK73GB1C104K	CHIP C 0.10UF K	
C820			CK73FBOJ106K	CHIP C 10UF K		C999			CK73GB1H222K	CHIP C 2200PF K	
C822			CK73GB1E105K	CHIP C 1.0UF K		CN702			E41-2672-05	PIN ASSY	
C823,824			CK73GB1C104K	CHIP C 0.10UF K		CN724	*		E40-6472-05	PIN ASSY	
C825			CC73GCH1H220J	CHIP C 22PF J		CN728			E40-5960-05	PIN ASSY	
C826,827			CK73GB1E105K	CHIP C 1.0UF K		CN744			E40-6357-05	PIN ASSY	
C829			CK73GB1H103K	CHIP C 0.010UF K		CN755			E40-6357-05	PIN ASSY	
C833			CK73GB1E105K	CHIP C 1.0UF K		CN771			E40-6357-05	PIN ASSY	
C837,838			CK73FBOJ106K	CHIP C 10UF K		CN782			E40-6438-05	FLAT CABLE CONNECTOR	
C841			CK73FBOJ106K	CHIP C 10UF K		CN783	*		E40-6532-05	PIN ASSY	
C844			CK73FBOJ106K	CHIP C 10UF K		CN950	*		E40-6720-05	SOCKET FOR PIN ASSY	
C845			CK73GB1H152K	CHIP C 1500PF K		CN951	*		E41-2730-05	PIN ASSY	
C846,847			CK73GB1H103K	CHIP C 0.010UF K		W700			E37-1326-05	LEAD WIRE WITH CONNECTOR	
C849			CC73GCH1H121J	CHIP C 120PF J		F700			F53-0328-05	FUSE(5.0A)	
C850			CK73GB1C104K	CHIP C 0.10UF K		F701			F53-0195-05	FUSE(2.5A)	
C851			CK73GB1H472K	CHIP C 4700PF K		CN701			J19-5386-05	HOLDER	
C852			CK73GB0J475K	CHIP C 4.7UF K		L650			L92-0446-05	BEADS CORE	
C853,854			CK73GB1H103K	CHIP C 0.010UF K		L700,701			L92-0140-05	CHIP FERRITE	
C855			CK73GB0J475K	CHIP C 4.7UF K		L704-715			L92-0163-05	BEADS CORE	
C856			CK73GB1H103K	CHIP C 0.010UF K		L716,717			L92-0162-05	BEADS CORE	
C857			CC73GCH1H121J	CHIP C 120PF J		L718			L92-0446-05	BEADS CORE	
C858			CK73GB1H392K	CHIP C 3900PF K		L721			L92-0446-05	BEADS CORE	
C859			C92-0894-05	ELECTRO 47UF 25WV		L722,723			L92-0140-05	CHIP FERRITE	
C860			CK73GB0J475K	CHIP C 4.7UF K		L724-732			L92-0179-05	CHIP FERRITE	
C862			CC73GCH1H101J	CHIP C 100PF J		X700			L77-2304-05	CRYSTAL RESONATOR(32768HZ)	
C863		*	CK73GB1H102K	CHIP C 1000PF K		X701			L77-1962-05	VCXO(18.432MHZ)	
C864			C92-0895-05	ELECTRO 100UF 25WV		CP700-702			R90-0743-05	MULTIPLE RESISTOR(47K*2)	
C865-867			CK73GB1H103K	CHIP C 0.010UF K		CP703,704			R90-0745-05	MULTIPLE RESISTOR(470K*2)	
C868			CK73GB1C104K	CHIP C 0.10UF K		R597			RK73GB2A333J	CHIP R 33K J 1/10W	
C869			CK73GB1H103K	CHIP C 0.010UF K		R598,599			RK73GB2A104J	CHIP R 100K J 1/10W	
C871			CK73GB1C104K	CHIP C 0.10UF K		R602			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C872			C92-0894-05	ELECTRO 47UF 25WV		R603			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C874			CK73GB1C104K	CHIP C 0.10UF K		R604,605			RK73HB1J100J	CHIP R 10 J 1/16W	
C875			CK73GB1H103K	CHIP C 0.010UF K		R606			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C878			CK73GB1C104K	CHIP C 0.10UF K		R607			RK73HB1J474J	CHIP R 470K J 1/16W	
C879			CK73GB1H103K	CHIP C 0.010UF K		R608,609			RK73HB1J100J	CHIP R 10 J 1/16W	
C880			CK73GB1C104K	CHIP C 0.10UF K		R610,611			RK73HB1J474J	CHIP R 470K J 1/16W	
C881			CK73GB1H103K	CHIP C 0.010UF K		R612			RK73HB1J100J	CHIP R 10 J 1/16W	
C889			CK73GB1C104K	CHIP C 0.10UF K		R613,614			RK73HB1J470J	CHIP R 47 J 1/16W	
C890,891			CK73GB1H103K	CHIP C 0.010UF K		R615			RK73HB1J474J	CHIP R 470K J 1/16W	
C892-899			CK73GB1H102K	CHIP C 1000PF K		R616,617			RK73HB1J100J	CHIP R 10 J 1/16W	
C900			CC73GCH1H470J	CHIP C 47PF J		R618			RK73HB1J474J	CHIP R 470K J 1/16W	
C901,902			CK73GB1C104K	CHIP C 0.10UF K		R619,620			RK73HB1J470J	CHIP R 47 J 1/16W	
C904			CK73GB1H103K	CHIP C 0.010UF K		R621			RK73HB1J101J	CHIP R 100 J 1/16W	
C905,906			CK73GB1C104K	CHIP C 0.10UF K		R623,624			RK73GB2A220J	CHIP R 22 J 1/10W	
C907-909			CK73GB1H103K	CHIP C 0.010UF K		R625			RK73GB2A000J	CHIP R 0.0 J 1/10W	
C910			CK73FBOJ106K	CHIP C 10UF K							
C912			C92-0870-05	CHIP TNL 4.7UF 16WV							
C914			CK73GB1C104K	CHIP C 0.10UF K							
C915			CK73GB1C473K	CHIP C 0.047UF K							

PARTS LIST

CONTROL UNIT (X53-4120-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R627			RK73GB2A223J	CHIP R 22K J 1/10W		R720			RK73GB2A473J	CHIP R 47K J 1/10W	
R628			RK73GB2A103J	CHIP R 10K J 1/10W		R721			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R629			RK73HB1J100J	CHIP R 10 J 1/16W		R722			RK73GB2A473J	CHIP R 47K J 1/10W	
R630			RK73GB2A563J	CHIP R 56K J 1/10W		R723			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R631			RK73GB2A274J	CHIP R 270K J 1/10W		R724			RK73GB2A473J	CHIP R 47K J 1/10W	
R632,633			RK73GB2A333J	CHIP R 33K J 1/10W		R726			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R634-636			RK73GB2A102J	CHIP R 1.0K J 1/10W		R728,729			RK73GB2A473J	CHIP R 47K J 1/10W	
R637-640			RK73GB2A333J	CHIP R 33K J 1/10W		R730-734			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R641-649			RK73HB1J000J	CHIP R 0.0 J 1/16W		R735			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R650			RK73FB2B000J	CHIP R 0.0 J 1/8W		R736			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R651			RK73GB2A000J	CHIP R 0.0 J 1/10W		R738			RK73GB2A103J	CHIP R 10K J 1/10W	
R652			RK73GB2A474J	CHIP R 470K J 1/10W		R739			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R653			RK73GB2A470J	CHIP R 47 J 1/10W		R740			RK73GB2A332J	CHIP R 3.3K J 1/10W	
R654,655			RK73GB2A474J	CHIP R 470K J 1/10W		R741-744			RK73GB2A473J	CHIP R 47K J 1/10W	
R656-658			RK73GB2A100J	CHIP R 47 J 1/10W		R745			RK73HB1J104J	CHIP R 100K J 1/16W	
R659			RK73GB2A474J	CHIP R 470K J 1/10W		R746			RK73HB1J473J	CHIP R 47K J 1/16W	
R660			RK73GB2A103J	CHIP R 10K J 1/10W		R748			RK73HB1J473J	CHIP R 47K J 1/16W	
R661			RK73GB2A333J	CHIP R 33K J 1/10W		R749,750			RK73HB1J104J	CHIP R 100K J 1/16W	
R662			RK73GB2A100J	CHIP R 10 J 1/10W		R751			RK73HB1J474J	CHIP R 470K J 1/16W	
R663,664			RK73GB2A333J	CHIP R 33K J 1/10W		R752,753			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R665			RK73GB2A100J	CHIP R 10 J 1/10W		R754			RK73HB1J474J	CHIP R 470K J 1/16W	
R666			RK73GB2A104J	CHIP R 100K J 1/10W		R755			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R667			RK73GB2A684J	CHIP R 680K J 1/10W		R756			RK73HB1J473J	CHIP R 47K J 1/16W	
R668			RK73GB2A474J	CHIP R 470K J 1/10W		R757			RK73GB2A104J	CHIP R 100K J 1/10W	
R669			RK73GB2A100J	CHIP R 10 J 1/10W		R758			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R670			RK73GB2A333J	CHIP R 33K J 1/10W		R759			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R671			RK73GB2A104J	CHIP R 100K J 1/10W		R760			RK73GB2A333J	CHIP R 33K J 1/10W	
R672,673			RK73GB2A100J	CHIP R 10 J 1/10W		R761			RK73GB2A473J	CHIP R 47K J 1/10W	
R674			RK73GB2A474J	CHIP R 470K J 1/10W		R762,763			RN73HH1J102D	CHIP R 1.0K D 1/16W	
R675			RK73GB2A473J	CHIP R 47K J 1/10W		R764			RK73HH1J393D	CHIP R 39K D 1/16W	
R676			RK73GB2A333J	CHIP R 33K J 1/10W		R765			RK73HH1J123D	CHIP R 12K D 1/16W	
R677			RK73GB2A103J	CHIP R 10K J 1/10W		R766			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R678			RK73GB2A104J	CHIP R 100K J 1/10W		R767			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R679-681			RK73HB1J000J	CHIP R 0.0 J 1/16W		R768			RK73FB2B471J	CHIP R 470 J 1/8W	
R682			RK73GB2A000J	CHIP R 0.0 J 1/10W		R769			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R685			RK73GB2A000J	CHIP R 0.0 J 1/10W		R771			RK73GB2A472J	CHIP R 4.7K J 1/10W	
R686			RK73GB2A223J	CHIP R 22K J 1/10W		R772			RK73GB2A104J	CHIP R 100K J 1/10W	
R687			RK73GB2A153J	CHIP R 15K J 1/10W		R773			RK73HB1J474J	CHIP R 470K J 1/16W	
R688,689			RK73GB2A473J	CHIP R 47K J 1/10W		R774,775			RK73GB2A473J	CHIP R 47K J 1/10W	
R690			RK73FB2B000J	CHIP R 0.0 J 1/8W		R776			RK73HB1J474J	CHIP R 470K J 1/16W	
R693,694			RK73FB2B000J	CHIP R 0.0 J 1/8W		R777			RK73GB2A473J	CHIP R 47K J 1/10W	
R697			RK73FB2B000J	CHIP R 0.0 J 1/8W		R778-782			RK73HB1J101J	CHIP R 100 J 1/16W	
R699			RK73GB2A473J	CHIP R 47K J 1/10W		R783			RK73HB1J473J	CHIP R 47K J 1/16W	
R701			RK73GB2A000J	CHIP R 0.0 J 1/10W		R784-786			RK73HB1J101J	CHIP R 100 J 1/16W	
R702			RK73GB2A102J	CHIP R 1.0K J 1/10W		R787			RK73HB1J474J	CHIP R 470K J 1/16W	
R703			RK73GB2A103J	CHIP R 10K J 1/10W		R788			RK73FB2B473J	CHIP R 47K J 1/8W	
R704			R92-3591-05	METAL-R 1.0K J 1/2W		R789			RK73HB1J473J	CHIP R 47K J 1/16W	
R705			RK73GB2A102J	CHIP R 1.0K J 1/10W		R790			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R706,707			RK73GB2A104J	CHIP R 100K J 1/10W		R791-810			RK73HB1J101J	CHIP R 100 J 1/16W	
R708			RK73GB2A103J	CHIP R 10K J 1/10W		R811			RK73HB1J474J	CHIP R 470K J 1/16W	
R709			RK73GB2A104J	CHIP R 100K J 1/10W		R812			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R710-712			RK73GB2A473J	CHIP R 47K J 1/10W		R813			RK73GB2A274J	CHIP R 270K J 1/10W	
R713			RK73GB2A102J	CHIP R 1.0K J 1/10W		R814			RK73HB1J104J	CHIP R 100K J 1/16W	
R714			RK73GB2A473J	CHIP R 47K J 1/10W		R815			RK73HB1J473J	CHIP R 47K J 1/16W	
R715			RK73GB2A102J	CHIP R 1.0K J 1/10W		R816			RK73GB2A104J	CHIP R 100K J 1/10W	
R716			RK73GB2A473J	CHIP R 47K J 1/10W		R817,818			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R717			RK73GB2A102J	CHIP R 1.0K J 1/10W		R819			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R718			RK73GB2A473J	CHIP R 47K J 1/10W		R820			RK73HB1J104J	CHIP R 100K J 1/16W	
R719			RK73GB2A102J	CHIP R 1.0K J 1/10W		R821			RK73HB1J473J	CHIP R 47K J 1/16W	

TK-5810(B)

PARTS LIST

CONTROL UNIT (X53-4120-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R822			RK73HB1J000J	CHIP R 0.0 J 1/16W		R908			RK73GB2A103J	CHIP R 10K J 1/10W	
R823			RK73HB1J473J	CHIP R 47K J 1/16W		R909			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R824-826			RK73HB1J474J	CHIP R 470K J 1/16W		R910			RK73GB2A103J	CHIP R 10K J 1/10W	
R829-834			RK73HB1J473J	CHIP R 47K J 1/16W		R911			RK73GB2A333J	CHIP R 33K J 1/10W	
						R912			RK73GB2A473J	CHIP R 47K J 1/10W	
R835			RK73GB2A103J	CHIP R 10K J 1/10W							
R837			RK73GB2A473J	CHIP R 47K J 1/10W		R913			RK73GB2A124J	CHIP R 120K J 1/10W	
R838			RK73GB2A102J	CHIP R 1.0K J 1/10W		R914			RK73GB2A103J	CHIP R 10K J 1/10W	
R839			RK73GB2A473J	CHIP R 47K J 1/10W		R915			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R840			RK73GB2A153J	CHIP R 15K J 1/10W		R916			RK73GB2A333J	CHIP R 33K J 1/10W	
						R917			RK73HB1J103J	CHIP R 10K J 1/16W	
R841			RK73GB2A103J	CHIP R 10K J 1/10W							
R842			RK73GB2A123J	CHIP R 12K J 1/10W		R918,919			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R843			RK73GB2A564J	CHIP R 560K J 1/10W		R920			RK73GB2A333J	CHIP R 33K J 1/10W	
R844			RK73GB2A474J	CHIP R 470K J 1/10W		R922			RK73HB1J104J	CHIP R 100K J 1/16W	
R845			RK73GB2A472J	CHIP R 4.7K J 1/10W		R923,924			RK73GB2A473J	CHIP R 47K J 1/10W	
						R926			RN73GH1J473D	CHIP R 47K D 1/16W	
R846			RK73GB2A682J	CHIP R 6.8K J 1/10W							
R847			RK73GB2A822J	CHIP R 8.2K J 1/10W		R928			RK73GB2A473J	CHIP R 47K J 1/10W	
R848			RK73GB2A000J	CHIP R 0.0 J 1/10W		R929			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R849			RK73GB2A154J	CHIP R 150K J 1/10W		R930			RK73GB2A333J	CHIP R 33K J 1/10W	
R850			RK73GB2A333J	CHIP R 33K J 1/10W		R932			RN73GH1J273D	CHIP R 27K D 1/16W	
						R933			RN73GH1J184D	CHIP R 180K D 1/16W	
R851,852			RK73HB1J473J	CHIP R 47K J 1/16W							
R853			RK73GB2A470J	CHIP R 47 J 1/10W		R934			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R854			RK73GB2A123J	CHIP R 12K J 1/10W		R937,938			RK73GB2A223J	CHIP R 22K J 1/10W	
R855			RK73GB2A474J	CHIP R 470K J 1/10W		R939			RK73HB1J470J	CHIP R 47 J 1/16W	
R856			RK73GB2A104J	CHIP R 100K J 1/10W		R940			RK73GB2A123J	CHIP R 12K J 1/10W	
						R941,942			RK73HB1J470J	CHIP R 47 J 1/16W	
R857			RK73HB1J000J	CHIP R 0.0 J 1/16W							
R858			RK73GB2A224J	CHIP R 220K J 1/10W		R943			RK73GB2A333J	CHIP R 33K J 1/10W	
R859			RK73GB2A104J	CHIP R 100K J 1/10W		R944			RK73GB2A471J	CHIP R 470 J 1/10W	
R860			RK73GB2A000J	CHIP R 0.0 J 1/10W		R945			RK73GB2A103J	CHIP R 10K J 1/10W	
R861			RK73GB2A223J	CHIP R 22K J 1/10W		R946			RK73GB2A105J	CHIP R 1.0M J 1/10W	
						R947			RK73GB2A471J	CHIP R 470 J 1/10W	
R862			RK73GB2A000J	CHIP R 0.0 J 1/10W							
R863			RK73GB2A333J	CHIP R 33K J 1/10W		R948			RK73GB2A103J	CHIP R 10K J 1/10W	
R864			RK73HB1J000J	CHIP R 0.0 J 1/16W		R949			RK73GB2A474J	CHIP R 470K J 1/10W	
R865			RK73GB2A104J	CHIP R 100K J 1/10W		R950			RK73GB2A394J	CHIP R 390K J 1/10W	
R866			RK73GB2A473J	CHIP R 47K J 1/10W		R951			RK73GB2A154J	CHIP R 150K J 1/10W	
						R955			RK73GB2A474J	CHIP R 470K J 1/10W	
R867			RK73GB2A333J	CHIP R 33K J 1/10W							
R868			RK73GB2A000J	CHIP R 0.0 J 1/10W		R956			RK73GB2A123J	CHIP R 12K J 1/10W	
R870			RK73GB2A000J	CHIP R 0.0 J 1/10W		R957			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R874			RK73GB2A100J	CHIP R 10 J 1/10W		R958,959			RK73GB2A104J	CHIP R 100K J 1/10W	
R875			RK73GB2A153J	CHIP R 15K J 1/10W		R960			RK73GB2A000J	CHIP R 0.0 J 1/10W	
						R961			RK73GB2A394J	CHIP R 390K J 1/10W	
R876			RK73GB2A154J	CHIP R 150K J 1/10W							
R877			RK73HB1J000J	CHIP R 0.0 J 1/16W		R962			RK73GB2A273J	CHIP R 27K J 1/10W	
R878			RK73GB2A103J	CHIP R 10K J 1/10W		R963			RK73GB2A100J	CHIP R 10 J 1/10W	
R879			RK73GB2A104J	CHIP R 100K J 1/10W		R964,965			RK73GB2A103J	CHIP R 10K J 1/10W	
R882			RK73GB2A473J	CHIP R 4.7 J 1/10W		R966			RK73GB2A102J	CHIP R 1.0K J 1/10W	
						R967			RK73GB2A683J	CHIP R 68K J 1/10W	
R883			RK73GB2A272J	CHIP R 2.7K J 1/10W							
R886			RK73GB2A104J	CHIP R 100K J 1/10W		R968			RK73GB2A273J	CHIP R 27K J 1/10W	
R887			RK73HB1J000J	CHIP R 0.0 J 1/16W		R969			RK73GB2A274J	CHIP R 270K J 1/10W	
R888			RK73GB2A473J	CHIP R 47K J 1/10W		R970,971			RK73GB2A104J	CHIP R 100K J 1/10W	
R890			RK73GB2A684J	CHIP R 680K J 1/10W		R973			RK73GB2A104J	CHIP R 100K J 1/10W	
						R974			RK73GB2A563J	CHIP R 56K J 1/10W	
R891			RK73GB2A473J	CHIP R 47K J 1/10W							
R892			RK73HB1J473J	CHIP R 47K J 1/16W		R975			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R893			RK73GB2A392J	CHIP R 3.9K J 1/10W		R976			RK73GB2A334J	CHIP R 330K J 1/10W	
R894			RK73GB2A103J	CHIP R 10K J 1/10W		R977			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R895			RK73GB2A332J	CHIP R 3.3K J 1/10W		R978			RK73GB2A104J	CHIP R 100K J 1/10W	
						R980			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R896			RK73GB2A274J	CHIP R 270K J 1/10W							
R897			RK73GB2A000J	CHIP R 0.0 J 1/10W		R981			RK73GB2A472J	CHIP R 4.7K J 1/10W	
R898			RK73GB2A103J	CHIP R 10K J 1/10W		R982			RK73GB2A274J	CHIP R 270K J 1/10W	
R899-903			RK73GB2A000J	CHIP R 0.0 J 1/10W		R983,984			RK73GB2A104J	CHIP R 100K J 1/10W	
R906			RK73GB2A473J	CHIP R 47K J 1/10W		R987			RK73GB2A000J	CHIP R 0.0 J 1/10W	
						R988			RK73GB2A684J	CHIP R 680K J 1/10W	

PARTS LIST

CONTROL UNIT (X53-4120-10)
TX-RX UNIT (X57-7270-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R993			RK73GB2A681J	CHIP R 680 J 1/10W		IC722			ADM202EARNZ	MOS-IC	
R994			RK73GB2A104J	CHIP R 100K J 1/10W		IC723			TA75S01F-F	MOS-IC	
R995			RK73GB2A333J	CHIP R 33K J 1/10W		IC724			AK4550VTP	MOS-IC	
R996			RK73HB1J470J	CHIP R 47 J 1/16W		IC725,726			TC7WU04FK	MOS-IC	
R998			RK73HB1J470J	CHIP R 47 J 1/16W							
R999			RK73GB2A000J	CHIP R 0.0 J 1/10W		IC727			BU4053BCFV	MOS-IC	
K700			S76-0434-05	RELAY		IC728			BU4094BCFV	MOS-IC	
D650,651			CUS01	DIODE		IC729			TC75W51FUF	MOS-IC	
D652,653			DA221	DIODE		IC730			EX128TQ64I630C	MOS-IC	
D700-704			DA204U	DIODE		IC731			TC7W66FK-F	MOS-IC	
D705			1SS355	DIODE		IC732			TDA8561Q	BI-POLAR IC	
D706			DA204U	DIODE		IC733			TC75W51FUF	MOS-IC	
D707			02DZ18F-X,Y	ZENER DIODE		IC734			TC7S66FUF	MOS-IC	
D708			DA204U	DIODE		IC735			TA75W01FUF	MOS-IC	
D709			1SS355	DIODE		IC736			TC7W66FK-F	MOS-IC	
D710			02DZ18F-X,Y	ZENER DIODE		IC737			LMC7101BIM5	MOS-IC	
D711,712			DA204U	DIODE		IC738			M62364FP-F	MOS-IC	
D713,714			02DZ18F-X,Y	ZENER DIODE		IC739			TA75S01F-F	MOS-IC	
D715			1SS388F	DIODE		IC740			LMC7101BIM5	MOS-IC	
D719			02DZ15F-X,Y	ZENER DIODE		IC741			NJM78L05UA-ZB	BI-POLAR IC	
D720			1SS355	DIODE		IC742			TA75S01F-F	MOS-IC	
D721			02DZ5.1F-Y	ZENER DIODE		IC743			TC7S66FUF	MOS-IC	
D722			1SS355	DIODE		IC745			TC75S51F-F	MOS-IC	
D723		*	02DZ10F-Z	ZENER DIODE		IC950			TC7SBD384AFU	MOS-IC	
D724			1SS355	DIODE		IC951			TC75S51F-F	MOS-IC	
D725			02DZ18F-X,Y	ZENER DIODE		IC952			XC6201P302MR	MOS-IC	
D726			DA204U	DIODE		Q700,701			2SD2114K(W)	TRANSISTOR	
D727,728			RB706F-40	DIODE		Q702,703			DTC114TUA	DIGITAL TRANSISTOR	
D731,732			02DZ5.1F-Y	ZENER DIODE		Q704			SSM3K15TE(F)	FET	
D734			1SS355	DIODE		Q705			DTC114YE	DIGITAL TRANSISTOR	
D736			MINISMD075F24	VARISTOR		Q706			DTA114YE	DIGITAL TRANSISTOR	
D737			02DZ5.1F-Y	ZENER DIODE		Q707			DTC114EE	DIGITAL TRANSISTOR	
D738-742			AVRM1608C270K2	VARISTOR		Q708,709			DTA114EE	DIGITAL TRANSISTOR	
D743,744			DA204U	DIODE		Q710			DTC114EE	DIGITAL TRANSISTOR	
D745-748			1SS388F	DIODE		Q711			DTA114YE	DIGITAL TRANSISTOR	
D749,750			MA2S111-F	DIODE		Q712			DTC114TE	DIGITAL TRANSISTOR	
D751			02DZ5.1F-Y	ZENER DIODE		Q713			2SJ506-E(S)	FET	
IC700			RV5C386A	MOS-IC		Q714			DTC114YE	DIGITAL TRANSISTOR	
IC701			CAT24C256WIG3	ROM IC		Q715			2SC4738(GR)F	TRANSISTOR	
IC702			MM1522XURE	ANALOGUE IC		Q716			2SA1832(GR)F	TRANSISTOR	
IC703			30625MGP347GU	MICROPROCESSOR IC		Q717			DTC114YE	DIGITAL TRANSISTOR	
IC704		*	S-80942CNNBG9C	MOS-IC		Q719			SSM3K15TE(F)	FET	
IC705			TC4013BF(N)	MOS-IC		Q720			2SJ243-A	FET	
IC706			LM2940T-8.0	MOS-IC		Q721			SSM3K15TE(F)	FET	
IC707			TA7805FQ	MOS-IC		Q723			2SJ243-A	FET	
IC708			XC6204B332M	MOS-IC		Q725			SSM3K15TE(F)	FET	
IC709			XC6209B152M	MOS-IC		Q728			DTC114TE	DIGITAL TRANSISTOR	
IC710			XC6204B332M	MOS-IC		Q729			2SJ243-A	FET	
IC711			XC6204B252M	MOS-IC		Q730			DTC114EE	DIGITAL TRANSISTOR	
IC712			Note 1	ROM IC		Q731			DTC144EE	DIGITAL TRANSISTOR	
IC713			TC7S08FU	MOS-IC		Q732			2SD1757K	TRANSISTOR	
IC714			TC75S51F-F	MOS-IC		Q733,734			SSM3K15TE(F)	FET	
IC715			Note 1	MICROPROCESSOR IC		Q735,736			UM6K1N	FET	
IC716			NJM78L05UA-ZB	BI-POLAR IC		Q950,951			DTC114TUA	DIGITAL TRANSISTOR	
IC717			BU4094BCFV	MOS-IC		TX-RX UNIT (X57-7270-XX) -10:K -11:K2					
IC718,719			TC75W51FUF	MOS-IC		C151			CK73GB1H471K	CHIP C 470PF	K
IC720			TC7W66FK-F	MOS-IC		C152			CC73GCH1H100C	CHIP C 10PF	C
IC721			TC7WH74FK	MOS-IC		C153			CC73GCH1H220J	CHIP C 22PF	J
						C155			CC73GCH1H181J	CHIP C 180PF	J

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 (X57-7270-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C156			CK73GB1H471K	CHIP C 470PF K		C233			CC73GCH1H220J	CHIP C 22PF J	K
C157			CC73GCH1H010B	CHIP C 1.0PF B	K	C233			CC73GCH1H270J	CHIP C 27PF J	K2
C157			CC73GCH1H080B	CHIP C 8.0PF B	K2	C234			CK73GB1H471K	CHIP C 470PF K	
C158			CC73GCH1H120J	CHIP C 12PF J	K	C235			CC73GCH1H080B	CHIP C 8.0PF B	K
C158			CC73GCH1H180J	CHIP C 18PF J	K2	C235			CC73GCH1H100C	CHIP C 10PF C	K2
C160			CC73GCH1H101J	CHIP C 100PF J		C236			CK73GB1H471K	CHIP C 470PF K	
C161			CK73GB1H471K	CHIP C 470PF K		C238,239			CC73GCH1H680J	CHIP C 68PF J	
C162		*	C92-0865-05	ELECTRO 47UF 20WV		C240			CK73GB1H103K	CHIP C 0.010UF K	
C163			CC73GCH1H050B	CHIP C 5.0PF B		C241,242			CK73GB1H471K	CHIP C 470PF K	
C164			CK73GB1H471K	CHIP C 470PF K		C243			CK73GB1H103K	CHIP C 0.010UF K	
C165			CC73GCH1H060B	CHIP C 6.0PF B	K	C244,245			CC73GCH1H080B	CHIP C 8.0PF B	
C165			CC73GCH1H070B	CHIP C 7.0PF B	K2	C246			CC73GCH1H050B	CHIP C 5.0PF B	
C166			CK73GB1H471K	CHIP C 470PF K		C247			CC73GCH1H040B	CHIP C 4.0PF B	
C167			CC73GCH1H050B	CHIP C 5.0PF B		C248			CC73GCH1H090B	CHIP C 9.0PF B	
C168			CK73GB1H103K	CHIP C 0.010UF K		C249,250			CK73GB1H103K	CHIP C 0.010UF K	
C169,170			CK73GB1H471K	CHIP C 470PF K		C251			CC73GCH1H050B	CHIP C 5.0PF B	K
C200			CK73GB1H471K	CHIP C 470PF K		C251			CC73GCH1H080B	CHIP C 8.0PF B	K2
C201			CC73GCH1H030B	CHIP C 3.0PF B	K	C252			CC73GCH1H100C	CHIP C 10PF C	K
C201			CC73GCH1H040B	CHIP C 4.0PF B	K2	C252			CC73GCH1H120J	CHIP C 12PF J	K2
C202			CK73GB1H471K	CHIP C 470PF K		C253			CC73GCH1H050B	CHIP C 5.0PF B	K
C203			CC73GCH1H020B	CHIP C 2.0PF B	K2	C253			CC73GCH1H080B	CHIP C 8.0PF B	K2
C203			CC73GCH1H1R5B	CHIP C 1.5PF B	K	C254			CK73GB1H103K	CHIP C 0.010UF K	
C204			CC73GCH1H030B	CHIP C 3.0PF B	K	C255			CC73GCH1H100C	CHIP C 10PF C	
C204			CC73GCH1H040B	CHIP C 4.0PF B	K2	C256			CC73GCH1H090B	CHIP C 9.0PF B	
C205			CC73GCH1H0R5B	CHIP C 0.5PF B	K	C257			CC73GCH1H080B	CHIP C 8.0PF B	
C205			CC73GCH1H010B	CHIP C 1.0PF B	K2	C260			CC73GCH1H040B	CHIP C 4.0PF B	K2
C206			CK73GB1H471K	CHIP C 470PF K		C260			CC73GCH1H050B	CHIP C 5.0PF B	K
C207			CC73GCH1H030B	CHIP C 3.0PF B		C261			CK73GB1H471K	CHIP C 470PF K	K
C208			CC73GCH1H0R5B	CHIP C 0.5PF B	K	C262			CK73GB1H103K	CHIP C 0.010UF K	
C208			CC73GCH1H010B	CHIP C 1.0PF B	K2	C263			CC73GCH1H101J	CHIP C 100PF J	K2
C209,210			CK73GB1H471K	CHIP C 470PF K		C263			CC73GCH1H120J	CHIP C 12PF J	K
C211			CC73GCH1H030B	CHIP C 3.0PF B	K	C264			CK73GB1H103K	CHIP C 0.010UF K	
C211			CC73GCH1H040B	CHIP C 4.0PF B	K2	C265			CK73GB1H471K	CHIP C 470PF K	K2
C212			CC73GCH1H020B	CHIP C 2.0PF B	K2	C265,266			CK73GB1H471K	CHIP C 470PF K	K
C212			CC73GCH1H1R5B	CHIP C 1.5PF B	K	C266			CC73GCH1H101J	CHIP C 100PF J	K2
C213			CK73GB1H471K	CHIP C 470PF K		C267			CK73GB1H103K	CHIP C 0.010UF K	
C214			CC73GCH1H120J	CHIP C 12PF J	K2	C268			CC73GCH1H101J	CHIP C 100PF J	
C214			CC73GCH1H150J	CHIP C 15PF J	K	C269			CC73GCH1H120J	CHIP C 12PF J	
C216			CK73GB1H471K	CHIP C 470PF K		C270			CK73GB1E103K	CHIP C 0.010UF K	
C218			CC73GCH1H080B	CHIP C 8.0PF B	K2	C271			CK73GB1H102K	CHIP C 1000PF K	
C218			CC73GCH1H100C	CHIP C 10PF C	K	C272			CK73GB1H103K	CHIP C 0.010UF K	
C220-223			CK73GB1H471K	CHIP C 470PF K		C273			CC73GCH1H090B	CHIP C 9.0PF B	
C224			CC73GCH1H180J	CHIP C 18PF J	K2	C274			CC73GCH1H080B	CHIP C 8.0PF B	
C224			CC73GCH1H220J	CHIP C 22PF J	K	C275,276			CC73GCH1H040B	CHIP C 4.0PF B	
C225			CC73GCH1H090B	CHIP C 9.0PF B	K	C277			CC73GCH1H090B	CHIP C 9.0PF B	
C225			CC73GCH1H100C	CHIP C 10PF C	K2	C278			CC73GCH1H100C	CHIP C 10PF C	
C226			CC73GCH1H030B	CHIP C 3.0PF B	K	C279,280			CK73GB1H103K	CHIP C 0.010UF K	
C226			CC73GCH1H050B	CHIP C 5.0PF B	K2	C281			CC73GCH1H090B	CHIP C 9.0PF B	
C227			CC73GCH1H150J	CHIP C 15PF J	K2	C282			CC73GCH1H080B	CHIP C 8.0PF B	
C227			CC73GCH1H180J	CHIP C 18PF J	K	C285,286			CK73GB1H102K	CHIP C 1000PF K	
C228			CC73GCH1H070B	CHIP C 7.0PF B	K	C287			CK73GB1H103K	CHIP C 0.010UF K	
C228			CC73GCH1H090B	CHIP C 9.0PF B	K2	C288-290			CK73GB1C104K	CHIP C 0.10UF K	
C229			CC73GCH1H040B	CHIP C 4.0PF B	K	C291			CC73GCH1H470J	CHIP C 47PF J	
C229			CC73GCH1H060B	CHIP C 6.0PF B	K2	C292			CC73GCH1H101J	CHIP C 100PF J	
C230			CC73GCH1H150J	CHIP C 15PF J	K2	C296			CK73GB1H103K	CHIP C 0.010UF K	
C230			CC73GCH1H180J	CHIP C 18PF J	K	C298-300			CK73GB1C104K	CHIP C 0.10UF K	
C231			CC73GCH1H070B	CHIP C 7.0PF B	K	C302			CK73GB1E103K	CHIP C 0.010UF K	
C231			CC73GCH1H090B	CHIP C 9.0PF B	K2	C304			CC73GCH1H470J	CHIP C 47PF J	
C232			CC73GCH1H050B	CHIP C 5.0PF B		C305			CK73GB1E103K	CHIP C 0.010UF K	

PARTS LIST

TX-RX UNIT (X57-7270-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C306			CC73GCH1H101J	CHIP C 100PF J		C441			CC73GCH1H020B	CHIP C 2.0PF B	K
C309-315			CK73GB1C104K	CHIP C 0.10UF K		C441			CC73GCH1H1R5B	CHIP C 1.5PF B	K2
C316			CK73FB0J106K	CHIP C 10UF K		C442			CC73GCH1H020B	CHIP C 2.0PF B	K2
C317			CC73GCH1H150J	CHIP C 15PF J		C442			CC73GCH1H030B	CHIP C 3.0PF B	K
C319			CC73GCH1H150J	CHIP C 15PF J		C443			CC73GCH1H030B	CHIP C 3.0PF B	K2
C320			CK73GB1C104K	CHIP C 0.10UF K		C443			CC73GCH1H050B	CHIP C 5.0PF B	K
C321,322			CK73GB1E103K	CHIP C 0.010UF K		C444,445			CK73GB1E105K	CHIP C 1.0UF K	
C323			CC73GCH1H030B	CHIP C 3.0PF B		C446			CS77AB21C4R7M	CHIP TNTL 4.7UF 16WV	
C324			CK73GB1C104K	CHIP C 0.10UF K		C447			CC73GCH1H101J	CHIP C 100PF J	
C325			CK73GB1E103K	CHIP C 0.010UF K		C448,449			CK73GB1C104K	CHIP C 0.10UF K	
C326			CS77AA0J100M	CHIP TNTL 10UF 6.3WV		C450			CK73GF1A105Z	CHIP C 1.0UF Z	
C327			CC73GCH1H181J	CHIP C 180PF J		C451-456			CK73GB1H471K	CHIP C 470PF K	
C328			CC73GCH1H270J	CHIP C 27PF J		C457			CC73GCH1H020B	CHIP C 2.0PF B	K2
C329			CK73GB1C104K	CHIP C 0.10UF K		C457			CC73GCH1H3R5B	CHIP C 3.5PF B	K
C330			CC73GCH1H181J	CHIP C 180PF J		C458			CC73GCH1H010B	CHIP C 1.0PF B	K
C331			CK73GB1H152J	CHIP C 1500PF J		C458			CC73GCH1H1R5B	CHIP C 1.5PF B	K2
C332			CK73GB1H102K	CHIP C 1000PF K		C459			CC73GCH1H101J	CHIP C 100PF J	K
C333			CK73GB1C333K	CHIP C 0.033UF K		C459			CC73GCH1H470J	CHIP C 47PF J	K2
C334			CK73GB1C104K	CHIP C 0.10UF K		C460			CK73GB1E105K	CHIP C 1.0UF K	
C335			CS77AAQJ220M	CHIP TNTL 22UF 6.3WV		C461			CC73GCH1H181J	CHIP C 180PF J	
C336			CK73GB1H102K	CHIP C 1000PF K		C463			CK73GB1H471K	CHIP C 470PF K	
C337,338			CK73GB1C104K	CHIP C 0.10UF K		C464			CC73GCH1H101J	CHIP C 100PF J	
C340			CK73GB1H102K	CHIP C 1000PF K		C465			CC73GCH1H220J	CHIP C 22PF J	
C341			CK73GB1C104K	CHIP C 0.10UF K		C466-468			CK73GB1E105K	CHIP C 1.0UF K	
C342			CK73GB1A224K	CHIP C 0.22UF K		C470-472			CK73GB1H471K	CHIP C 470PF K	
C400			CK73GB1H471K	CHIP C 470PF K		C474			CK73GB1H103K	CHIP C 0.010UF K	
C401			CK73GB1E103K	CHIP C 0.010UF K		C475			C93-0787-05	CERAMIC 0.1UF 50WV	
C402,403			CC73GCH1H101J	CHIP C 100PF J		C477			CK73GB1H103K	CHIP C 0.010UF K	
C404			CK73GB1C104K	CHIP C 0.10UF K		C478	*		CS77AC1D220M	CHIP TNTL 22UF 20WV	
C406			CK73GB1E103K	CHIP C 0.010UF K		C479			CK73GB1H471K	CHIP C 470PF K	
C407			CC73GCH1H101J	CHIP C 100PF J		C480	*		CS77AC1D220M	CHIP TNTL 22UF 20WV	
C408-410			CK73GB1H471K	CHIP C 470PF K		C482,483			CK73GB1H103K	CHIP C 0.010UF K	
C412			CC73GCH1H101J	CHIP C 100PF J	K	C484			CK73GB1H471K	CHIP C 470PF K	
C412,413			CC73GCH1H101J	CHIP C 100PF J	K2	C485			CC73GCH1H101J	CHIP C 100PF J	K
C413,414			CC73GCH1H470J	CHIP C 47PF J	K	C485			CC73GCH1H270G	CHIP C 27PF G	K2
C414			CC73GCH1H470J	CHIP C 47PF J	K2	C487			CK73GB1H471K	CHIP C 470PF K	
C415			C92-0863-05	CHIP TNTL 0.047UF 35WV		C488			CC73GCH1H120G	CHIP C 12PF G	K
C416			CS77AA1E010M	CHIP TNTL 1.0UF 25WV	K	C488			CC73GCH1H150G	CHIP C 15PF G	K2
C416			CS77CA1ER47M	CHIP TNTL 0.47UF 25WV	K2	C489			CC73GCH1H330G	CHIP C 33PF G	
C417			C92-0863-05	CHIP TNTL 0.047UF 35WV		C490			CS77AA1A100M	CHIP TNTL 10UF 10WV	
C418			CK73GB1C104K	CHIP C 0.10UF K		C491			CC73GCH1H010B	CHIP C 1.0PF B	K
C419			CC73GCH1H470J	CHIP C 47PF J		C491			CC73GCH1H0R5B	CHIP C 0.5PF B	K2
C420			CK73GB1H471K	CHIP C 470PF K		C492			CK73GB1H471K	CHIP C 470PF K	K
C423			CK73GB1H103K	CHIP C 0.010UF K		C492			CK73GB1H681K	CHIP C 680PF K	K2
C424			CK73GB1C104K	CHIP C 0.10UF K		C494			CC73GCH1H070B	CHIP C 7.0PF B	
C425			CC73GCH1H101J	CHIP C 100PF J		C495			CC73GCH1H1R5B	CHIP C 1.5PF B	
C427			CK73GB1H102K	CHIP C 1000PF K		C496			CC73GCH1H101J	CHIP C 100PF J	K
C430			CK73GB1H471K	CHIP C 470PF K		C496			CC73GCH1H390J	CHIP C 39PF J	K2
C431			CK73GB1H103K	CHIP C 0.010UF K		C497			CC73GCH1H1R5B	CHIP C 1.5PF B	K
C432			CK73FB1C334K	CHIP C 0.33UF K		C497			CC73GCH1H0R5B	CHIP C 0.5PF B	K2
C433			CK73GB1C104K	CHIP C 0.10UF K		C499			CC73GCH1H090B	CHIP C 9.0PF B	K2
C434			CK73GB1H471K	CHIP C 470PF K		C499			CC73GCH1H100C	CHIP C 10PF C	K
C435			CC73GCH1H080B	CHIP C 8.0PF B	K2	C500,501			CK73GB1H471K	CHIP C 470PF K	
C436			CC73GCH1H060B	CHIP C 6.0PF B	K2	C502			CC73GCH1H020B	CHIP C 2.0PF B	K
C436			CC73GCH1H270J	CHIP C 27PF J	K	C502			CC73GCH1H2R5B	CHIP C 2.5PF B	K2
C437			CC73GCH1H470J	CHIP C 47PF J		C503			CS77AB21A220M	CHIP TNTL 22UF 10WV	
C438			CC73GCH1H050B	CHIP C 5.0PF B	K2	C504			CS77AC1A470M	CHIP TNTL 47UF 10WV	
C438,439			CC73GCH1H2R5B	CHIP C 2.5PF B	K	C505			CK73GB1H103K	CHIP C 0.010UF K	
C439			CC73GCH1H470J	CHIP C 47PF J	K2	C506			CK73GB1H471K	CHIP C 470PF K	

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TX-RX UNIT (X57-7270-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C508			CK73GB1H471K	CHIP C 470PF K		CN202			E41-2735-05	PIN ASSY	
C509			CC73GCH1H050B	CHIP C 5.0PF B		CN207			E41-2735-05	PIN ASSY	
C510			CC73GCH1H040B	CHIP C 4.0PF B							
C511			CC73GCH1H030B	CHIP C 3.0PF B		CN600			E40-6438-05	FLAT CABLE CONNECTOR	
C512			CC73GCH1H0R5B	CHIP C 0.5PF B		CN601			E40-6429-05	FLAT CABLE CONNECTOR	
C513			CK73GB1H471K	CHIP C 470PF K		W400			E37-1235-05	JUMPER WIRE	
C514			CC73GCH1H060B	CHIP C 6.0PF B	K						
C514			CC73GCH1H070B	CHIP C 7.0PF B	K2	CF200			L72-1018-05	CERAMIC FILTER	
C515			CC73GCH1H0R5B	CHIP C 0.5PF B		CF201,202			L72-1016-05	CERAMIC FILTER	
C516			CC73GCH1H060B	CHIP C 6.0PF B		CF203			L72-1009-05	CERAMIC FILTER	
C517			CC73GCH1H050B	CHIP C 5.0PF B		CF204			L72-1018-05	CERAMIC FILTER	
C518			CC73GCH1H0R5B	CHIP C 0.5PF B		L150,151			L40-3975-92	SMALL FIXED INDUCTOR(39NH)	
C519,520			CK73GB1H471K	CHIP C 470PF K		L152			L40-5663-92	SMALL FIXED INDUCTOR(5.6NH)	
C521			CC73GCH1H070B	CHIP C 7.0PF B	K	L153			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	K2
C521			CC73GCH1H090B	CHIP C 9.0PF B	K2	L153,154			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	K
C522			CC73GCH1H070B	CHIP C 7.0PF B	K2	L154			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	K2
C522,523			CC73GCH1H060B	CHIP C 6.0PF B	K	L200-204			L34-4604-05	AIR-CORE COIL	
C523			CC73GCH1H050B	CHIP C 5.0PF B	K2	L205	*		L41-1878-08	SMALL FIXED INDUCTOR(18NH)	
C524			CC73GCH1H0R5B	CHIP C 0.5PF B		L206			L92-0140-05	CHIP FERRITE	
C525			CK73GB1H471K	CHIP C 470PF K		L207-210			L34-4565-05	AIR-CORE COIL	K
C527			CC73GCH1H050B	CHIP C 5.0PF B	K2	L207-210			L34-4566-05	AIR-CORE COIL	K2
C527			CC73GCH1H060B	CHIP C 6.0PF B	K	L211,212			L41-1588-08	SMALL FIXED INDUCTOR(150NH)	
C529			CK73GB1H471K	CHIP C 470PF K		L214,215			L39-1498-05	TOROIDAL COIL	
C530			CC73GCH1H040B	CHIP C 4.0PF B	K	L216			L92-0140-05	CHIP FERRITE	
C530			CC73GCH1H050B	CHIP C 5.0PF B	K2	L217,218			L34-4748-05	COIL	
C531-534			CK73GB1H471K	CHIP C 470PF K		L219			L39-1498-05	TOROIDAL COIL	
C535			CC73GCH1H060B	CHIP C 6.0PF B		L220,221	*		L41-1578-08	SMALL FIXED INDUCTOR(15NH)	K
C536			CK73GB1H471K	CHIP C 470PF K		L220,221	*		L41-2278-08	SMALL FIXED INDUCTOR(22NH)	K2
C537			CC73GCH1H050B	CHIP C 5.0PF B	K	L222,223			L34-4749-05	COIL	
C537			CC73GCH1H060B	CHIP C 6.0PF B	K2	L224	*		L41-1878-08	SMALL FIXED INDUCTOR(18NH)	K
C538,539			CK73GB1H471K	CHIP C 470PF K		L224			L41-3378-08	SMALL FIXED INDUCTOR(33NH)	K2
C540			CC73GCH1H101J	CHIP C 100PF J		L225			L40-6881-37	SMALL FIXED INDUCTOR(0.680UH)	
C541,542			CK73GB1H471K	CHIP C 470PF K		L226			L41-1008-08	SMALL FIXED INDUCTOR(10UH)	
C600			CK73GB1H471K	CHIP C 470PF K		L227,228			L34-4748-05	COIL	
C601			C92-0881-05	ELECTRO 47UF 10WV		L229,230			L34-4749-05	COIL	
C602,603			CK73GB1H471K	CHIP C 470PF K		L231			L41-1008-08	SMALL FIXED INDUCTOR(10UH)	
C604			CS77CA1C010M	CHIP TNL 1.0UF 16WV		L232			L40-5681-86	SMALL FIXED INDUCTOR(0.56UH)	
C605			CK73GB1H103K	CHIP C 0.010UF K		L234			L34-4725-05	COIL	
C606	*		C92-0887-05	ELECTRO 1.0UF 50WV		L401			L40-8265-92	SMALL FIXED INDUCTOR(8.2NH)	
C607,608			CK73GB1C104K	CHIP C 0.10UF K		L402,403			L41-1578-14	SMALL FIXED INDUCTOR(15NH)	K2
C609			C92-0870-05	CHIP TNL 4.7UF 16WV		L403,404			L41-4763-14	SMALL FIXED INDUCTOR(4.7NH)	K
C610-620			CK73GB1H471K	CHIP C 470PF K		L405			L41-3363-14	SMALL FIXED INDUCTOR(3.3NH)	K
C621			CK73GB1H102K	CHIP C 1000PF K		L405			L41-6868-14	SMALL FIXED INDUCTOR(6.8NH)	K2
C622-630			CK73GB1H471K	CHIP C 470PF K		L406			L33-1462-05	SMALL FIXED INDUCTOR	
C631,632			CK73GB1H102K	CHIP C 1000PF K		L407			L41-3363-14	SMALL FIXED INDUCTOR(3.3NH)	K
C634			CC73GCH1H1R5B	CHIP C 1.5PF B	K2	L407			L41-6868-14	SMALL FIXED INDUCTOR(6.8NH)	K2
C634			CC73GCH1H470J	CHIP C 47PF J	K	L408-417			L92-0140-05	CHIP FERRITE	
C635			CC73GCH1H020B	CHIP C 2.0PF B		L418-423			L41-1098-08	SMALL FIXED INDUCTOR(1.0UH)	
C636,637			CK73GB1C393K	CHIP C 0.039UF K	K	L424			L92-0140-05	CHIP FERRITE	
C638			CK73GB1C683K	CHIP C 0.068UF K	K	L425-430			L41-1098-08	SMALL FIXED INDUCTOR(1.0UH)	
C640			CC73GCH1H050B	CHIP C 5.0PF B	K	L431			L34-4607-05	AIR-CORE COIL	K
C640			CC73GCH1H120J	CHIP C 12PF J	K2	L431			L34-4608-05	AIR-CORE COIL	K2
C641			CK73GB1H471K	CHIP C 470PF K		L432,433			L41-1098-08	SMALL FIXED INDUCTOR(1.0UH)	
C642			CC73GCH1H050B	CHIP C 5.0PF B	K	L434			L34-4608-05	AIR-CORE COIL	K
C642			CC73GCH1H120J	CHIP C 12PF J	K2	L434			L34-4609-05	AIR-CORE COIL	K2
C644-647			CK73GB1H471K	CHIP C 470PF K		L435,436			L41-1098-08	SMALL FIXED INDUCTOR(1.0UH)	
CN150			E04-0154-05	PIN SOCKET		L437			L34-4608-05	AIR-CORE COIL	K
CN151			E04-0154-05	PIN SOCKET		L437			L34-4609-05	AIR-CORE COIL	K2
CN200			E04-0154-05	PIN SOCKET		L438,439			L41-1098-08	SMALL FIXED INDUCTOR(1.0UH)	
						L441			L40-2775-92	SMALL FIXED INDUCTOR(27NH)	K2

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
L441-444			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	K	R241			RK73GB2A271J	CHIP R 270 J 1/10W	K2
L442,443			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	K2	R242			RK73GB2A330J	CHIP R 33 J 1/10W	K2
L444			L40-1575-92	SMALL FIXED INDUCTOR(15NH)	K2	R242			RK73GB2A331J	CHIP R 330 J 1/10W	K
X200			L77-1961-05	VCXO(16.8MHZ)		R243			RK73GB2A183J	CHIP R 18K J 1/10W	K
X400		*	L77-3013-05	TCXO(16.8MHZ)		R243			RK73GB2A392J	CHIP R 3.9K J 1/10W	K2
XF200			L71-0626-05	CRYSTAL FILTER (49.95MHZ NARROW)		R244			RK73GB2A560J	CHIP R 56 J 1/10W	
XF201			L71-0625-05	CRYSTAL FILTER (49.95MHZ WIDE)		R245			RK73GB2A270J	CHIP R 27 J 1/10W	
R150,151			RK73GB2A821J	CHIP R 820 J 1/10W		R246			RK73GB2A222J	CHIP R 2.2K J 1/10W	
R152			RK73GB2A5R6J	CHIP R 5.6 J 1/10W		R247,248			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R154			RK73GB2A000J	CHIP R 0.0 J 1/10W		R249			RK73GB2A182J	CHIP R 1.8K J 1/10W	
R155			RK73GB2A123J	CHIP R 12K J 1/10W		R250			RK73GB2A153J	CHIP R 15K J 1/10W	
R156			RK73FB2B470J	CHIP R 47 J 1/8W		R251			RK73GB2A682J	CHIP R 6.8K J 1/10W	
R158			RK73FB2B101J	CHIP R 100 J 1/8W		R252			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R159			RK73GB2A000J	CHIP R 0.0 J 1/10W		R253			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R160			RK73GB2A102J	CHIP R 1.0K J 1/10W		R254			RK73GB2A222J	CHIP R 2.2K J 1/10W	
R161			RK73GB2A101J	CHIP R 100 J 1/10W		R255			RK73GB2A473J	CHIP R 47K J 1/10W	
R162			RK73GB2A332J	CHIP R 3.3K J 1/10W		R256			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R163			RK73FB2B100J	CHIP R 10 J 1/8W		R258			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R165			RK73FB2B100J	CHIP R 10 J 1/8W		R261			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R166,167			RK73FB2B271J	CHIP R 270 J 1/8W		R264			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R168			RK73FB2B180J	CHIP R 18 J 1/8W	K2	R265			RK73GB2A104J	CHIP R 100K J 1/10W	
R168			RK73FB2B220J	CHIP R 22 J 1/8W	K	R266			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R201-204			RK73GB2A104J	CHIP R 100K J 1/10W		R268,269			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R205,206			RK73GB2A183J	CHIP R 18K J 1/10W		R271			RK73GB2A104J	CHIP R 100K J 1/10W	
R208			RK73GB2A221J	CHIP R 220 J 1/10W		R272			RK73GB2A473J	CHIP R 47K J 1/10W	
R209,210			RK73GB2A000J	CHIP R 0.0 J 1/10W		R274			RK73GB2A182J	CHIP R 1.8K J 1/10W	
R211-215			RK73GB2A104J	CHIP R 100K J 1/10W		R275			RK73GB2A122J	CHIP R 1.2K J 1/10W	
R216			RK73GB2A000J	CHIP R 0.0 J 1/10W		R276			RK73GB2A182J	CHIP R 1.8K J 1/10W	
R219			RK73GB2A821J	CHIP R 820 J 1/10W	K2	R277			RK73GB2A122J	CHIP R 1.2K J 1/10W	
R220			RK73GB2A000J	CHIP R 0.0 J 1/10W	K	R284			RK73GB2A103J	CHIP R 10K J 1/10W	
R220			RK73GB2A5R6J	CHIP R 5.6 J 1/10W	K2	R287,288			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R221			RK73GB2A821J	CHIP R 820 J 1/10W	K2	R293,294			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R222			RK73GB2A470J	CHIP R 47 J 1/10W		R296			RK73GB2A331J	CHIP R 330 J 1/10W	
R223			RK73GB2A102J	CHIP R 1.0K J 1/10W		R297			RK73GB2A470J	CHIP R 47 J 1/10W	
R225			RK73GB2A390J	CHIP R 39 J 1/10W		R298			RK73GB2A681J	CHIP R 680 J 1/10W	
R226			RK73GB2A222J	CHIP R 2.2K J 1/10W		R299			RK73GB2A822J	CHIP R 8.2K J 1/10W	
R227			RK73GB2A470J	CHIP R 47 J 1/10W		R300			RK73GB2A470J	CHIP R 47 J 1/10W	
R228			RK73GB2A222J	CHIP R 2.2K J 1/10W		R301			RK73GB2A684J	CHIP R 680K J 1/10W	
R229,230			RK73GB2A102J	CHIP R 1.0K J 1/10W		R304-311			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R231			RK73FB2B181J	CHIP R 180 J 1/8W	K	R312			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R231			RK73FB2B271J	CHIP R 270 J 1/8W	K2	R313,314			RK73GB2A220J	CHIP R 22 J 1/10W	
R232			RK73FB2B180J	CHIP R 18 J 1/8W	K2	R315			RK73GB2A104J	CHIP R 100K J 1/10W	
R232			RK73FB2B330J	CHIP R 33 J 1/8W	K	R316			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R233			RK73FB2B181J	CHIP R 180 J 1/8W	K	R317			RK73GB2A273J	CHIP R 27K J 1/10W	
R233			RK73FB2B271J	CHIP R 270 J 1/8W	K2	R318			RK73GB2A470J	CHIP R 47 J 1/10W	
R234			RK73GB2A102J	CHIP R 1.0K J 1/10W		R319			RK73GB2A681J	CHIP R 680 J 1/10W	
R235			RK73GB2A222J	CHIP R 2.2K J 1/10W		R320			RK73GB2A331J	CHIP R 330 J 1/10W	
R236			RK73GB2A221J	CHIP R 220 J 1/10W	K	R321			RK73GB2A274J	CHIP R 270K J 1/10W	
R236			RK73GB2A680J	CHIP R 68 J 1/10W	K2	R323			RK73GB2A333J	CHIP R 33K J 1/10W	
R237			RK73GB2A103J	CHIP R 10K J 1/10W	K	R324,325			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R237			RK73GB2A561J	CHIP R 560 J 1/10W	K2	R326			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R238			RK73GB2A102J	CHIP R 1.0K J 1/10W		R327,328			RK73GB2A332J	CHIP R 3.3K J 1/10W	
R239			RK73GB2A181J	CHIP R 180 J 1/10W	K	R329			RK73GB2A273J	CHIP R 27K J 1/10W	
R239			RK73GB2A271J	CHIP R 270 J 1/10W	K2	R330			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R240			RK73GB2A180J	CHIP R 18 J 1/10W	K2	R333			RK73GB2A224J	CHIP R 220K J 1/10W	
R240			RK73GB2A330J	CHIP R 33 J 1/10W	K	R334			RK73GB2A471J	CHIP R 470 J 1/10W	
R241			RK73GB2A181J	CHIP R 180 J 1/10W	K	R335			RK73GB2A000J	CHIP R 0.0 J 1/10W	
						R336			RK73GB2A224J	CHIP R 220K J 1/10W	
						R337			RK73GB2A683J	CHIP R 68K J 1/10W	
						R338			RK73GB2A332J	CHIP R 3.3K J 1/10W	

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

TK-5810(B)

PARTS LIST

TX-RX UNIT (X57-7270-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R339			RK73GB2A000J	CHIP R 0.0 J 1/10W		R461			RN73GH1J222D	CHIP R 2.2K D 1/16W	
R340			RK73GB2A102J	CHIP R 1.0K J 1/10W		R462			RK73GB2A224J	CHIP R 220K J 1/10W	
R341			RK73GB2A332J	CHIP R 3.3K J 1/10W		R463			RK73GB2A124J	CHIP R 120K J 1/10W	
R342			RK73GB2A104J	CHIP R 100K J 1/10W		R464			RN73GH1J334D	CHIP R 330K D 1/16W	
R344			RK73GB2A000J	CHIP R 0.0 J 1/10W		R465			RK73GB2A100J	CHIP R 10 J 1/10W	
R345			RK73GB2A473J	CHIP R 47K J 1/10W		R466,467			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R400			RK73GB2A000J	CHIP R 0.0 J 1/10W		R468,469			RK73GB2A104J	CHIP R 100K J 1/10W	
R401			RK73GB2A104J	CHIP R 100K J 1/10W		R470			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R402			RK73GB2A102J	CHIP R 1.0K J 1/10W		R471			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R403			RK73GB2A563J	CHIP R 56K J 1/10W		R472			RK73GB2A106J	CHIP R 10M J 1/10W	
R404			RK73GB2A101J	CHIP R 100 J 1/10W		R473			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R405			RK73GB2A103J	CHIP R 10K J 1/10W		R474			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R406			RK73GB2A104J	CHIP R 100K J 1/10W		R475			RK73GB2A473J	CHIP R 47K J 1/10W	
R407-410			RK73GB2A101J	CHIP R 100 J 1/10W		R476,477			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R411			RK73GB2A000J	CHIP R 0.0 J 1/10W		R478			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R412-414			RK73GB2A101J	CHIP R 100 J 1/10W		R479			RN73GH1J391D	CHIP R 390 D 1/16W	K
R415			RK73GB2A103J	CHIP R 10K J 1/10W		R479			RN73GH1J471D	CHIP R 470 D 1/16W	K2
R416			RK73GB2A000J	CHIP R 0.0 J 1/10W		R480			RK73GB2A274J	CHIP R 270K J 1/10W	
R417			RK73GB2A103J	CHIP R 10K J 1/10W		R481			RN73GH1J391D	CHIP R 390 D 1/16W	K
R418			RK73GB2A102J	CHIP R 1.0K J 1/10W		R481			RN73GH1J561D	CHIP R 560 D 1/16W	K2
R419			RK73GB2A103J	CHIP R 10K J 1/10W	K2	R482			RN73GH1J271D	CHIP R 270 D 1/16W	K2
R419			RK73GB2A472J	CHIP R 4.7K J 1/10W	K	R482			RN73GH1J471D	CHIP R 470 D 1/16W	K
R420			RK73GB2A101J	CHIP R 100 J 1/10W	K2	R483			RK73GB2A152J	CHIP R 1.5K J 1/10W	
R420			RK73GB2A151J	CHIP R 150 J 1/10W	K	R484			RK73GB2A100J	CHIP R 10 J 1/10W	
R422			RK73GB2A122J	CHIP R 1.2K J 1/10W	K	R485			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R422			RK73GB2A392J	CHIP R 3.9K J 1/10W	K2	R486			RN73GH1J151D	CHIP R 150 D 1/16W	K
R423			RK73GB2A103J	CHIP R 10K J 1/10W	K2	R486	*		RN73GH1J181D	CHIP R 180 D 1/16W	K2
R423			RK73GB2A472J	CHIP R 4.7K J 1/10W	K	R487			RK73GB2A000J	CHIP R 0.0 J 1/10W	K2
R424			RK73GB2A330J	CHIP R 33 J 1/10W		R487			RN73GH1J101D	CHIP R 100 D 1/16W	K
R425			RK73GB2A221J	CHIP R 220 J 1/10W	K	R488			RK73GB2A104J	CHIP R 100K J 1/10W	
R426			RK73FB2B000J	CHIP R 0.0 J 1/8W		R489			RN73GH1J221D	CHIP R 220 D 1/16W	K
R427			RK73GB2A470J	CHIP R 47 J 1/10W		R489			RN73GH1J271D	CHIP R 270 D 1/16W	K2
R428			RK73GB2A101J	CHIP R 100 J 1/10W	K	R490			RK73GB2A000J	CHIP R 0.0 J 1/10W	K2
R428			RK73GB2A102J	CHIP R 1.0K J 1/10W	K2	R490			RN73GH1J101D	CHIP R 100 D 1/16W	K
R429		*	RN73GH1J470D	CHIP R 47 D 1/16W		R491			RK73GB2A224J	CHIP R 220K J 1/10W	
R430			RN73GH1J681D	CHIP R 680 D 1/16W		R493			RN73GH1J221D	CHIP R 220 D 1/16W	K
R431			RK73GB2A000J	CHIP R 0.0 J 1/10W	K	R493			RN73GH1J331D	CHIP R 330 D 1/16W	K2
R431			RK73GB2A102J	CHIP R 1.0K J 1/10W	K2	R494			RK73GB2A000J	CHIP R 0.0 J 1/10W	K2
R432			RK73GB2A561J	CHIP R 560 J 1/10W		R494			RN73GH1J101D	CHIP R 100 D 1/16W	K
R433			RK73GB2A101J	CHIP R 100 J 1/10W	K	R495			RK73GB2A471J	CHIP R 470 J 1/10W	K
R433			RK73GB2A222J	CHIP R 2.2K J 1/10W	K2	R496			RK73GB2A000J	CHIP R 0.0 J 1/10W	K2
R434			RN73GH1J331D	CHIP R 330 D 1/16W		R496			RK73GB2A120J	CHIP R 12 J 1/10W	K
R436,437			RK73GB2A000J	CHIP R 0.0 J 1/10W		R497			RK73GB2A471J	CHIP R 470 J 1/10W	K
R439			RK73GB2A151J	CHIP R 150 J 1/10W		R498			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R440			RK73GB2A000J	CHIP R 0.0 J 1/10W		R499			RK73GB2A223J	CHIP R 22K J 1/10W	K2
R441			RK73GB2A272J	CHIP R 2.7K J 1/10W		R499			RK73GB2A273J	CHIP R 27K J 1/10W	K
R444			RK73GB2A822J	CHIP R 8.2K J 1/10W		R500			RK73GB2A223J	CHIP R 22K J 1/10W	K
R445-447			RK73GB2A101J	CHIP R 100 J 1/10W		R500,501			RK73GB2A103J	CHIP R 10K J 1/10W	K2
R448			RK73GB2A154J	CHIP R 150K J 1/10W		R501			RK73GB2A153J	CHIP R 15K J 1/10W	K
R450			RK73GB2A330J	CHIP R 33 J 1/10W		R502			RK73GB2A330J	CHIP R 33 J 1/10W	
R451			RK73GB2A473J	CHIP R 47K J 1/10W		R504			RK73GB2A472J	CHIP R 4.7K J 1/10W	
R452			RK73GB2A102J	CHIP R 1.0K J 1/10W		R505			RK73GB2A151J	CHIP R 150 J 1/10W	K
R453			RK73GB2A100J	CHIP R 10 J 1/10W		R505			RK73GB2A471J	CHIP R 470 J 1/10W	K2
R454			RK73GB2A000J	CHIP R 0.0 J 1/10W		R506			RK73GB2A472J	CHIP R 4.7K J 1/10W	
R455			RK73GB2A104J	CHIP R 100K J 1/10W		R507			RK73GB2A101J	CHIP R 100 J 1/10W	K2
R456			RK73GB2A102J	CHIP R 1.0K J 1/10W		R507			RK73GB2A151J	CHIP R 150 J 1/10W	K
R457			RK73GB2A104J	CHIP R 100K J 1/10W		R508			RK73GB2A331J	CHIP R 330 J 1/10W	
R458			RN73GH1J104D	CHIP R 100K D 1/16W		R509			RK73GB2A330J	CHIP R 33 J 1/10W	
R459			RK73FB2B000J	CHIP R 0.0 J 1/8W		R510			RK73GB2A222J	CHIP R 2.2K J 1/10W	
R460			RK73GB2A123J	CHIP R 12K J 1/10W		R511			RK73GB2A101J	CHIP R 100 J 1/10W	

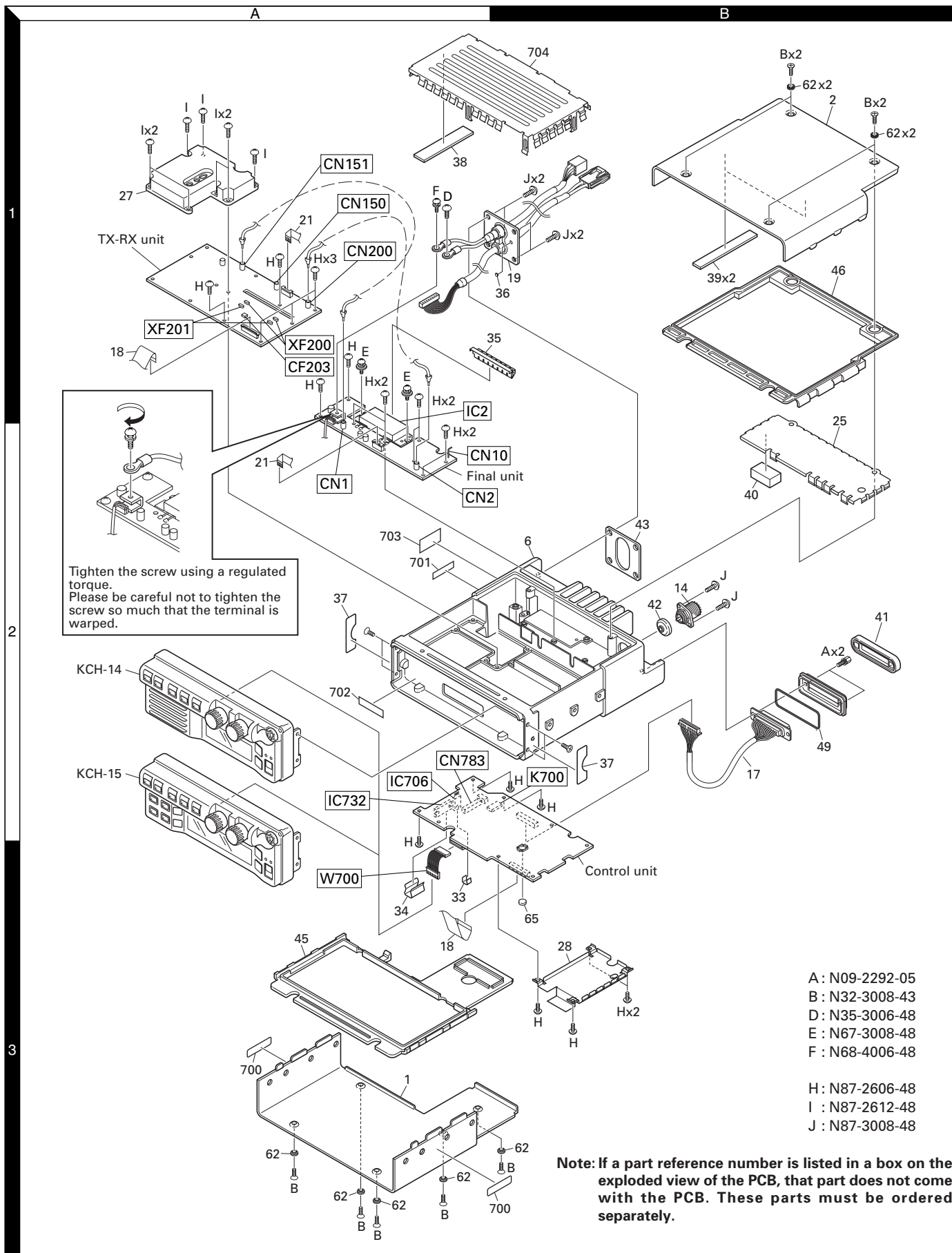
PARTS LIST

TX-RX UNIT (X57-7270-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R512			RK73GB2A221J	CHIP R 220 J 1/10W	K	Q211			2SC4617(S)	TRANSISTOR	
R513,514			RK73GB2A102J	CHIP R 1.0K J 1/10W		Q400			2SK879(Y)F	FET	
R600			RK73GB2A473J	CHIP R 47K J 1/10W		Q401			DTC144EE	DIGITAL TRANSISTOR	
R601			RK73GB2A222J	CHIP R 2.2K J 1/10W		Q402			2SA1832(GR)F	TRANSISTOR	
R602			RK73GB2A473J	CHIP R 47K J 1/10W		Q403			2SC5108(Y)F	TRANSISTOR	
R603			RK73GB2A472J	CHIP R 4.7K J 1/10W		Q404			RN47A4-F	TRANSISTOR	
R604,605			RK73GB2A000J	CHIP R 0.0 J 1/10W		Q405			2SJ347F	FET	
R606			RK73GB2A273J	CHIP R 27K J 1/10W		Q406			SSM5H01TU	FET	
R607,608			RK73GB2A000J	CHIP R 0.0 J 1/10W	K2	Q407			RN47A4-F	TRANSISTOR	
R607,608			RK73GB2A391J	CHIP R 390 J 1/10W	K	Q408			2SJ347F	FET	
R609			RK73GB2A181J	CHIP R 180 J 1/10W	K	Q409,410			RN47A4-F	TRANSISTOR	
R610			RN73GH1J183D	CHIP R 18K D 1/16W		Q411,412			2SC4116(GR)F	TRANSISTOR	
R611			RK73GB2A000J	CHIP R 0.0 J 1/10W		Q413-415			2SK508NV(52K)	FET	
D200-203			1SV291F	VARIABLE CAPACITANCE DIODE		Q416-418			2SC5108(Y)F	TRANSISTOR	
D204-207			1SV286F	VARIABLE CAPACITANCE DIODE		Q600			DTC114EE	DIGITAL TRANSISTOR	
D208-215			HVC131	DIODE		Q601			2SB1132(Q,R)	TRANSISTOR	
D216			RB706F-40	DIODE		Q602			DTC114EE	DIGITAL TRANSISTOR	
D217			1SS388F	DIODE		Q603			2SB1132(Q,R)	TRANSISTOR	
D400			MA2S111-F	DIODE							
D401			DA221	DIODE							
D402			1SV282-F	VARIABLE CAPACITANCE DIODE	K2						
D402			1SV305F	VARIABLE CAPACITANCE DIODE	K						
D403			HVC376B	VARIABLE CAPACITANCE DIODE	K						
D405			BB664	VARIABLE CAPACITANCE DIODE	K						
D405-408			1SV282-F	VARIABLE CAPACITANCE DIODE	K2						
D406,407			1SV282-F	VARIABLE CAPACITANCE DIODE	K						
D408			1SV305F	VARIABLE CAPACITANCE DIODE	K						
D409			HVC376B	VARIABLE CAPACITANCE DIODE	K						
D411-413			1SV282-F	VARIABLE CAPACITANCE DIODE	K2						
D411,412			1SV282-F	VARIABLE CAPACITANCE DIODE	K						
D413			1SV305F	VARIABLE CAPACITANCE DIODE	K						
D414			HVC376B	VARIABLE CAPACITANCE DIODE	K						
D416,417			1SV282-F	VARIABLE CAPACITANCE DIODE	K						
D418			1SV278F	VARIABLE CAPACITANCE DIODE							
D419,420			HVC131	DIODE							
D421,422			1SV282-F	VARIABLE CAPACITANCE DIODE							
IC200			SPM5001	MOS-IC							
IC201-203			TC7W53FK(F)	MOS-IC							
IC204			TC75S51F-F	MOS-IC							
IC205-207			TC7W53FK(F)	MOS-IC							
IC209		*	TA31137FNG	MOS-IC							
IC210		*	TC7WU04FK-F	MOS-IC							
IC211			TC7S66FUF	MOS-IC							
IC400			LMX2352TMX/NP	ANALOGUE IC							
IC401			MCP41100T	ANALOGUE IC							
IC402			XC9101D09AKR	ANALOGUE IC							
IC403			LMC7101BIM5	MOS-IC							
IC600			BU4094BCFV	MOS-IC							
IC601			TA7805FQ	MOS-IC							
Q150,151			2SC3357-A(RF)	TRANSISTOR							
Q200			2SC3357-A(RF)	TRANSISTOR							
Q201			DTC114EE	DIGITAL TRANSISTOR							
Q202			DTA114EE	DIGITAL TRANSISTOR							
Q203,204			2SC3357-A(RF)	TRANSISTOR							
Q205			2SC4215-F(Y)	TRANSISTOR							
Q207			2SC5108(Y)F	TRANSISTOR							
Q208			DTC114EE	DIGITAL TRANSISTOR							
Q209			DTA114EE	DIGITAL TRANSISTOR							
Q210			SSM3K15TE(F)	FET							

TK-5810(B)

EXPLODED VIEW



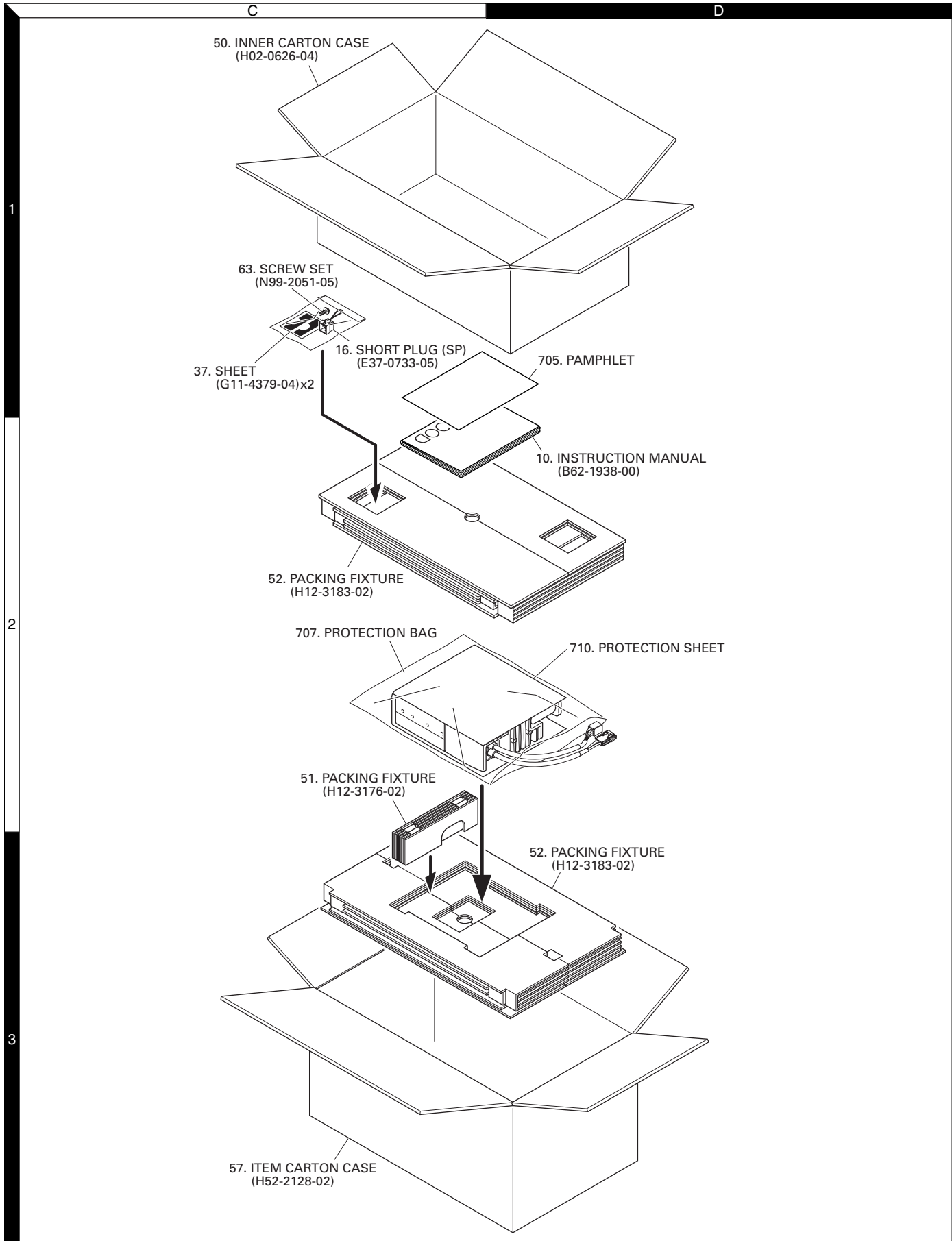
Tighten the screw using a regulated torque. Please be careful not to tighten the screw so much that the terminal is warped.

- A : N09-2292-05
- B : N32-3008-43
- D : N35-3006-48
- E : N67-3008-48
- F : N68-4006-48

- H : N87-2606-48
- I : N87-2612-48
- J : N87-3008-48

Note: If a part reference number is listed in a box on the exploded view of the PCB, that part does not come with the PCB. These parts must be ordered separately.

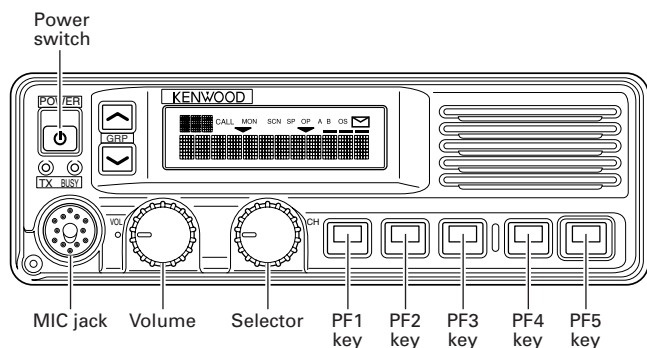
PACKING



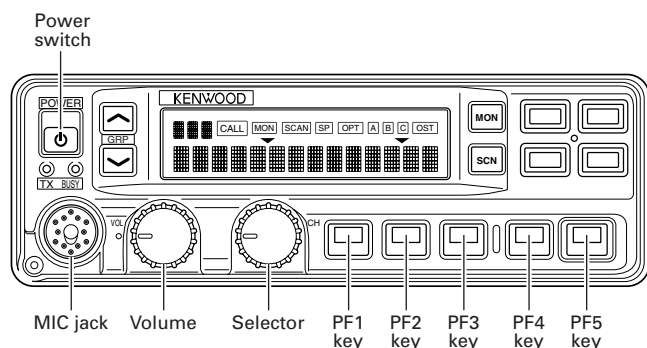
ADJUSTMENT

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 20 (Tone Test 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/Narrow/P25	Wide : "W" appears Narrow: "N" appears P25 : "A" appears
[GRPΛ]	Shifts to the Panel tuning mode	–
[GRPv]	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 presses is sent.	–

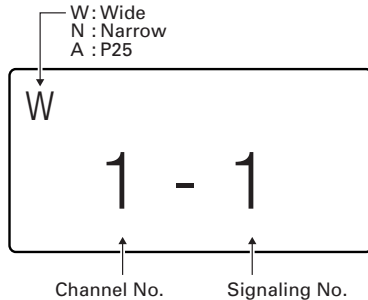
Key	"FNC" appears	
	Function	Display
[Selector]	Function off	–
[GRPΛ]	Squelch level 0	On : ▼ icon appears
[GRPv]	High power/Low power	Low: SP icon appears
[PF1]	Compander on/off	On : A icon appears
[PF2]	LCD all lights	LCD all point appears
[PF3]	MSK 1200bps/2400bps	2400bps: CALL icon appears
[PF4]	Beat shift on/off	On : OS (KCH-14) icon appears On : OST (KCH-15) icon appears
[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
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	K		K2	
	RX (MHz)	TX (MHz)	RX (MHz)	TX (MHz)
1	485.05000	485.10000	435.05000	435.10000
2	450.05000	450.10000	400.05000	400.10000
3	519.95000	519.90000	469.95000	469.90000
4	485.00000	485.00000	435.00000	435.00000
5	485.20000	485.20000	435.20000	435.20000
6	485.40000	485.40000	435.40000	435.40000
7~16	-	-	-	-

• 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 445N	DQT 445N	Analog
9	DQT 754I	DQT 754I	Analog
10	DTMF Code "159D"	DTMF Code "159D"	Analog
11	None	DTMF Code "9"	Analog
12	None	1633Hz Single Tone	Analog
13	2-tone: A : 304.7Hz B : 3106.0Hz	2-tone: A : 304.7Hz B : 3106.0Hz	Analog
14	Single Tone : 979.9Hz	Single Tone : 979.9Hz	Analog
15	None	MSK PN Pattern	Analog
16	MSK Sync : 0x052B Data : 0x230960C6AAAA CRC : 0xC4D7	MSK Sync : 0x052B Data : 0x230960C6AAAA CRC : 0xC4D7	Analog
17	NAC 293	NAC 293	P25
18	NAC 023	NAC 023	P25
19	NAC 5EA	NAC 5EA	P25
20	1011Hz Tone Test Pattern	1011Hz Tone Test Pattern	P25
21	NAC 293	Silence Pattern	P25
22	NAC 293	Calibration Pattern	P25
23	NAC 293	Transmitter Test Pattern	P25
24	NAC 293	Symbol Rate Pattern	P25
25	NAC 293	Low Deviation Pattern	P25
26	NAC 293	Fidelity Pattern	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).

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.

ADJUSTMENT

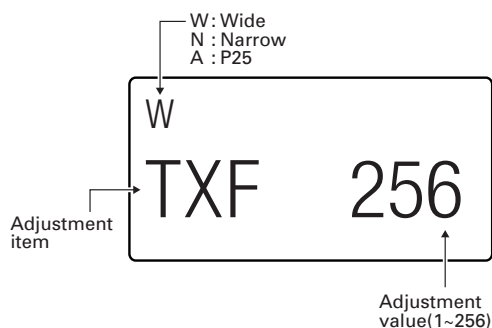
■ Transceiver tuning (To enter tuning mode)

To enter tuning mode, press the [GRPΛ] 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 [GRPv] key to exit 3, 5 or 7 reference level adjustments. If you press the [GRPv] key while the TX assist voltage, RX assist voltage (Upper) and RX assist voltage (Lower) are selected, the 7 reference level adjustment is performed automatically. When the automatic adjustment is completed, the ▼ icon appears on the LCD.

• LCD display in the panel tuning mode



■ Key operation

Key	Function
[Selector]	Unused
[GRPΛ]	Exit the panel tuning mode and shift to the panel test mode.
[GRPv]	Exit the 3, 5 or 7 reference level adjustments without backup. If you press the [GRPv] key while the TX assist voltage, RX assist voltage (Upper) and RX assist voltage (Lower) are selected, the 7 reference level adjustment is performed automatically. When the automatic adjustment is completed, the ▼ icon appears on the LCD. Additionally, even if you press the [GRPv] key after entering the 7 reference level adjustment, the automatic adjustment is not performed.
[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 3, 5 or 7 reference level adjustments.
MIC PTT	Transmit

■ 3, 5 or 7 reference level adjustments frequency

• 3 or 5 reference level adjustments frequency (Adjustment items other than assist voltage)

Tuning point	Display	K		K2	
		RX (MHz)	TX (MHz)	RX (MHz)	TX (MHz)
Low	L	450.10000	450.00000	400.10000	400.00000
Low'	LC	467.60000	467.50000	417.60000	417.50000
Center	C	485.10000	485.00000	435.10000	435.00000
High'	CH	502.60000	502.50000	452.60000	452.50000
High	H	519.90000	519.95000	469.90000	470.00000

• 7 reference level adjustments frequency (Assist voltage adjustments)

TX assist voltage

Tuning point	Display	K	K2
		TX (MHz)	
Low	LLL	450.10000	400.10000
Low''	LL	461.70000	411.70000
Low'	L	473.40000	423.40000
Center	C	485.10000	435.10000
High'	H	496.70000	446.70000
High''	HH	508.30000	458.30000
High	HHH	519.90000	469.90000

RX assist voltage (Upper)

Tuning point	Display	K	K2
		RX (MHz)	
Low	LLL	485.00000	435.00000
Low''	LL	490.90000	440.90000
Low'	L	496.70000	446.70000
Center	C	502.50000	452.50000
High'	H	508.33000	458.33000
High''	HH	514.16000	464.16000
High	HHH	520.00000	470.00000

RX assist voltage (Lower)

Tuning point	Display	K	K2
		RX (MHz)	
Low	LLL	450.00000	400.00000
Low''	LL	455.90000	405.90000
Low'	L	461.70000	411.70000
Center	C	467.50000	417.50000
High'	H	473.33000	423.33000
High''	HH	479.16000	429.16000
High	HHH	484.99500	434.99500

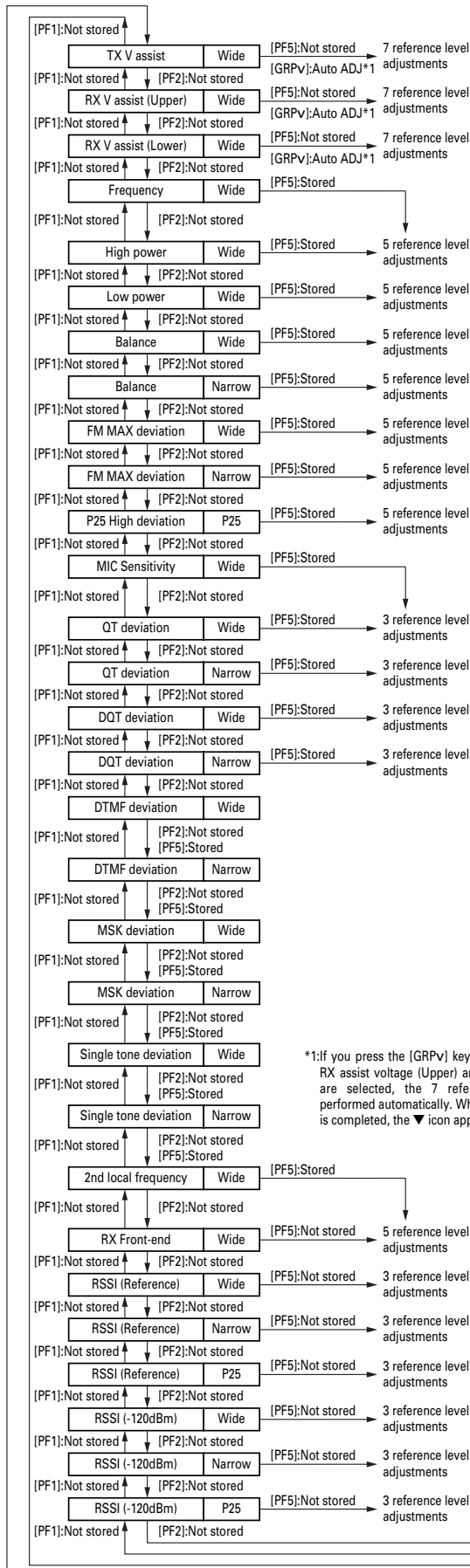
ADJUSTMENT

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

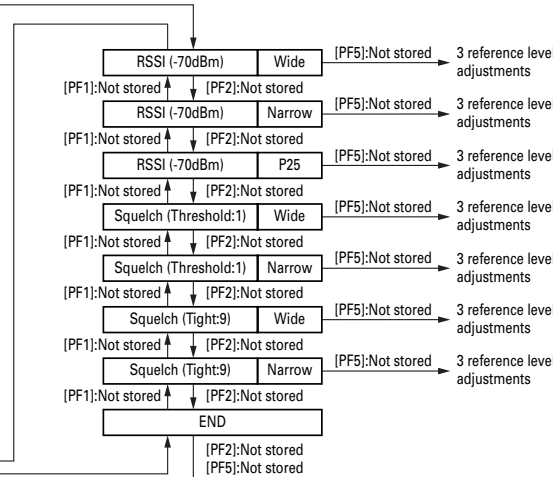
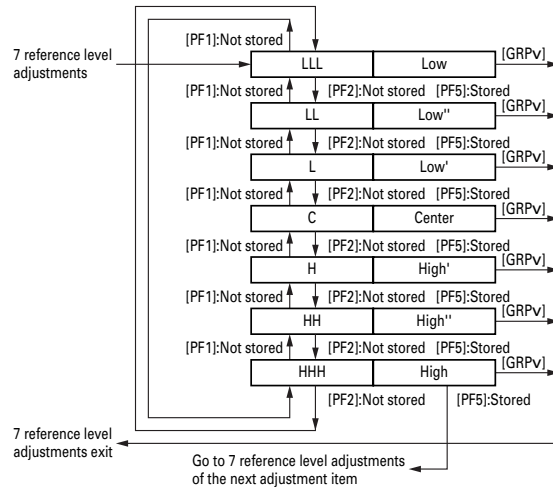
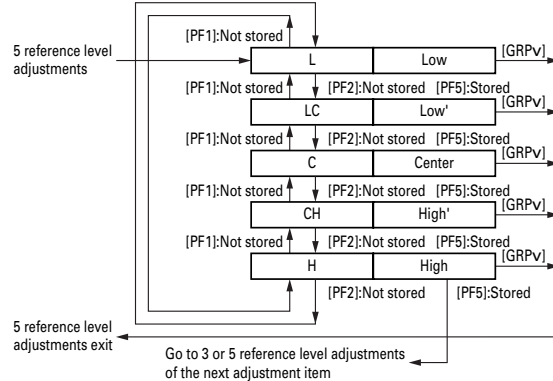
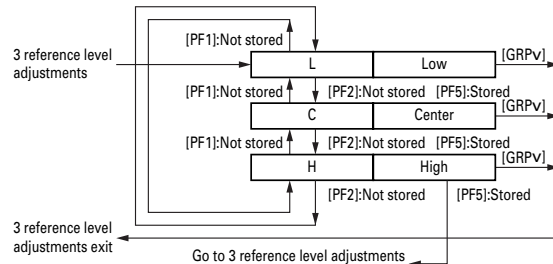
No.	Adjustment item	Display	Wide/Narrow/P25	Tuning point	Note
1	TX assist voltage	VATX ***	Wide	7	
2	RX assist voltage (Upper)	VARX u ***	Wide	7	
3	RX assist voltage (Lower)	VARX l ***	Wide	7	
4	Frequency	TXF ***	Wide	1	
5	High power	HPW ***	Wide	5	
6	Low power	LPW ***	Wide	5	
7	Balance (Wide)	BALW ***	Wide	5	100Hz Square Wave
8	Balance (Narrow)	BALN ***	Narrow	5	100Hz Square Wave
9	FM MAX deviation (Wide)	FMWD ***	Wide	5	
10	FM MAX deviation (Narrow)	FMND ***	Narrow	5	
11	P25 High deviation	HDVA ***	P25	5	Symbol Rate Pattern
12	MIC sensitivity	MIC ***	Wide	1	
13	QT deviation (Wide)	QTW ***	Wide	3	QT : 67Hz
14	QT deviation (Narrow)	QTN ***	Narrow	3	QT : 67Hz
15	DQT deviation (Wide)	DQTW ***	Wide	3	DQT : 023N
16	DQT deviation (Narrow)	DQTN ***	Narrow	3	DQT : 023N
17	DTMF deviation (Wide)	DTMW ***	Wide	1	DTMF Code : 9
18	DTMF deviation (Narrow)	DTMN ***	Narrow	1	DTMF Code : 9
19	MSK deviation (Wide)	MSKW ***	Wide	1	MSK PN Pattern
20	MSK deviation (Narrow)	MSKN ***	Narrow	1	MSK PN Pattern
21	Single tone deviation (Wide)	2TNW ***	Wide	1	Single Tone : 1633Hz
22	Single tone deviation (Narrow)	2TNN ***	Narrow	1	Single Tone : 1633Hz
23	2nd local frequency	SLO ***	Wide	1	
24	RX Front-end	FEND ***	Wide	5	AF unmute
25	RSSI (Reference) (Wide)	RRSI ***	Wide	3	
26	RSSI (Reference) (Narrow)	RRSI ***	Narrow	3	
27	RSSI (Reference) (P25)	RRSI ***	P25	3	
28	RSSI (-120dBm) (Wide)	LRSI ***	Wide	3	
29	RSSI (-120dBm) (Narrow)	LRSI ***	Narrow	3	
30	RSSI (-120dBm) (P25)	LRSI ***	P25	3	
31	RSSI (-70dBm) (Wide)	HRSI ***	Wide	3	
32	RSSI (-70dBm) (Narrow)	HRSI ***	Narrow	3	
33	RSSI (-70dBm) (P25)	HRSI ***	P25	3	
34	Squelch (Threshold:1) (Wide)	SQOW ***	Wide	3	AF unmute
35	Squelch (Threshold:1) (Narrow)	SQON ***	Narrow	3	AF unmute
36	Squelch (Tight:9) (Wide)	SQTW ***	Wide	3	AF unmute
37	Squelch (Tight:9) (Narrow)	SQTN ***	Narrow	3	AF unmute

ADJUSTMENT

Flow Chart



*1: If you press the [GRPv] key while the TX assist voltage, RX assist voltage (Upper) and RX assist voltage (Lower) are selected, the 7 reference level adjustment is performed automatically. When the automatic adjustment is completed, the ▼ icon appears on the LCD.



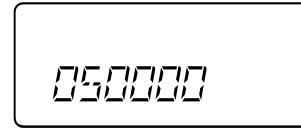
ADJUSTMENT

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 52.).
2. Select "20" for test signaling (Refer to "Test Signaling" described on page 53).
When "20" 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 53.).
4. Select a test frequency (Refer to "Test Frequency" described on page 53.).



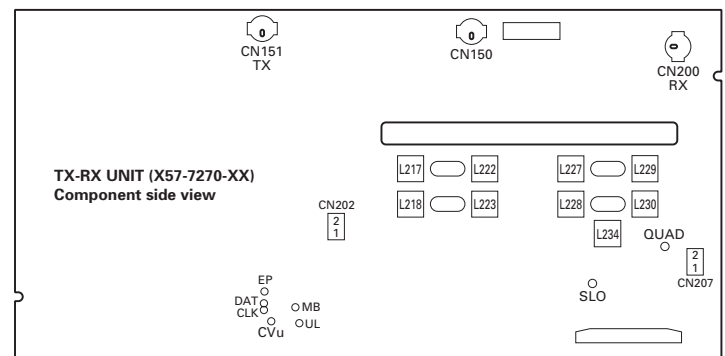
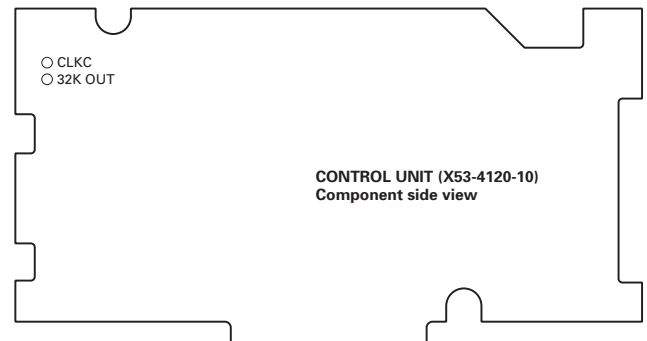
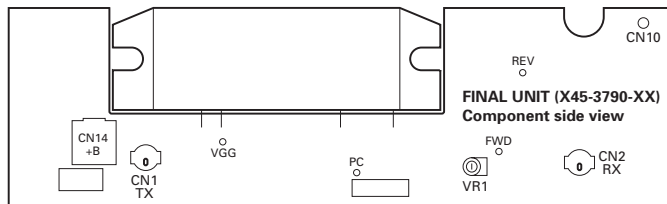
5. Measure the BER (Bit Error Rate) using the digital radio tester. Enter a standard input signal into the transceiver as a standard tone test pattern.
6. Adjust the input signal level to achieve the standard bit error rate (BER).
(For example, if the BER is 5%, the display shows "050000".)



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 53.). This test signal has a peak deviation equal to $\pi/2 \ 1800\text{Hz} = 2827\text{Hz}$.

Adjustment Points



ADJUSTMENT

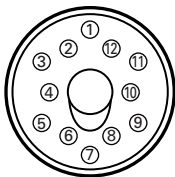
Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range Modulation Output	400 to 520MHz Frequency modulation and external modulation -127dBm/0.1μV to greater than -47dBm/1mV
2. Power Meter	Input Impedance Operation Frequency Measurement Range	50Ω 400 to 520MHz or more Vicinity of 200W
3. Deviation Meter	Frequency Range	400 to 520MHz
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

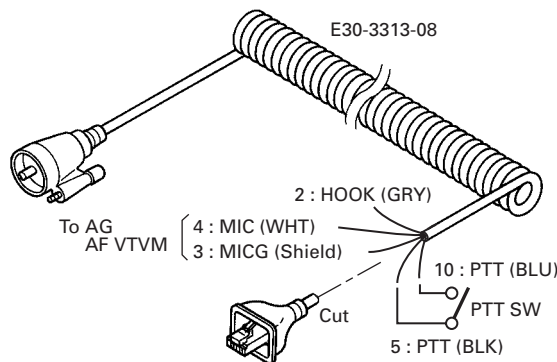
Since the RX AF output is a BTL output, there is a DC Component. Isolate this with a capacitor or transformer as shown in the figure.

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

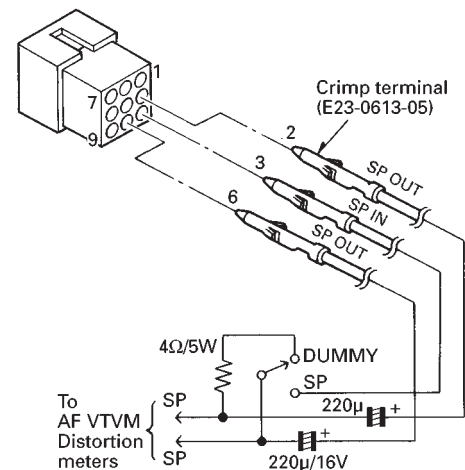
Test cable for microphone input



Cable for BPF or MCF adjustment

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

Test cable for speaker output

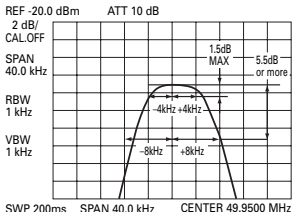


ADJUSTMENT

Common Section


Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) Connect the front panel kit (KCH-14 or KCH-15) to the transceiver. 2) Power supply voltage Power input connector:13.6V 3) SSG standard modulation [Wide] MOD:1kHz, DEV:3kHz [Narrow] MOD:1kHz, DEV:1.5kHz							
2. Assist voltage •TX	[Panel tuning mode] 1) Adj item:[VATX] Adjust:[***] 2) Adj item:[LLL VATX]→ [LL VATX]→[L VATX]→[C VATX]→ [H VATX]→[HH VATX]→[HHH VATX] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.	Power meter	Rear panel	ANT	Front panel	[PF3], [PF4]	Change the adjustment value within the limit of the specified voltage.	2.0V±0.1V K 2.2V±0.1V K2
•RX(Upper)	3) Adj item:[VARX u] Adjust:[***] 4) Adj item:[LLL VARX u]→ [LL VARX u]→[L VARX u]→ [C VARX u]→[H VARX u]→ [HH VARX u]→[HHH VARX u] Adjust:[***] Press [PF5] to store the adjustment value after adjustment.	DVM	TX-RX	CVu				When adjusting the assist voltage in PC tuning mode, slide the bar to indicate "VCO Lock Voltage" within 2.0V±0.1V (K), 2.2V±0.1V (K2) on Meter window.
•RX(Lower)	5) Adj item:[VARX l] Adjust:[***] 6) Adj item:[LLL VARX l]→ [LL VARX l]→[L VARX l]→ [C VARX l]→[H VARX l]→ [HH VARX l]→[HHH VARX l] Adjust:[***] Press [PF5] to store the adjustment value after adjustment.							

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. MCF •Wide	1) CH-Sig:1-1 Spectrum analyzer setting Center-f : 49.95MHz Span : 40kHz RBW : 1kHz VBW : 1kHz TG level : -20dBm XdB/div : 2dB Connect each cable (W05-1000-00) to CN202 and CN207.	Spectrum analyzer	Rear panel	ANT	TX-RX	L218 L223 L228 L230	Adjust the coils to obtain the waveform as shown to the right.	
	•Narrow	2) Turn the [Selector] knob as "N" (Narrow) appears on the LCD. Spectrum analyzer setting Center-f : 49.95MHz Span : 30kHz RBW : 1kHz VBW : 1kHz TG level : -20dBm XdB/div : 2dB				L217 L222 L227 L229		
5. 2nd local adjust	[Panel tuning mode] 1) Adj item:[W SLO] Adjust:[***] Press [PF5] to store the adjustment value after adjustment.	f.counter	TX-RX	SLO	TX-RX	[PF3], [PF4]	Change the adjustment value within the limit of the specified frequency.	50.4MHz±70Hz
6. Quadrature coil adjust	[Panel test mode] 1) CH-Sig:1-1 SSG output:-53dBm(501μV) (DEV:OFF)	SSG DVM AF VTVM Dummy load	TX-RX	QUAD EXT.SP	TX-RX	L234	Adjust the coil within the limit of the specified voltage.	1.0V±0.05V
7. RTC oscillation frequency adjust	1) CH-Sig:1-1	f.counter DVM DC power supply	CONTROL	CLKC 32KOUT		Programming Software: KPG-95D	Adjust the RTC oscillation frequency using the PC tuning mode. Perform the procedures below. 1. Apply 5V DC to the "CLKC" terminal of the control unit (X53-412). 2. Measure the output from the "32KOUT" terminal of the control unit (X53-412) using the calibrated frequency counter. 3. Enter the measured frequency value to "Crystal Oscillation Frequency" of RTC correction in the PC tuning mode and then click [OK] button.	Note: It is not necessary to adjust the RTC oscillation frequency under normal adjustments. The RTC oscillation frequency must be checked and adjusted when the 32 kHz crystal resonator (X700) is replaced.

ADJUSTMENT

Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency adjust *1	<p>[Panel test mode]</p> <p>1) CH-Sig : 3-1</p> <p>[Panel tuning mode]</p> <p>2) Adj item:[W TXF]</p> <p>Adjust:[***]</p> <p>PTT:ON</p> <p>Press [PF5] to store the adjustment value after adjustment.</p>	f.counter	Rear panel	ANT	Front panel	[PF3], [PF4]	High frequency ±50Hz	Note:After replacing the VCXO (X200) align frequency.
2. Max power adjust	<p>[Panel test mode]</p> <p>1) CH-Sig:1-1</p> <p>PTT:ON</p>	Power meter Ammeter			Final	VR1	50W	±2W
3. High power adjust	<p>[Panel tuning mode]</p> <p>1) Adj item:[W HPW]</p> <p>Adjust:[***]</p> <p>2) Adj item:[WL HPW]→ [WLC HPW]→[WC HPW]→ [WCH HPW]→[WH HPW]</p> <p>Adjust:[***]</p> <p>PTT:ON</p> <p>Press [PF5] to store the adjustment value after adjustment.</p>				Front panel	[PF3], [PF4]	45W	±1W 14A or less
4. Low power adjust	<p>1) Adj item:[W LPW]</p> <p>Adjust:[***]</p> <p>2) Adj item:[WL LPW]→ [WLC LPW]→[WC LPW]→ [WCH LPW]→[WH LPW]</p> <p>Adjust:[***]</p> <p>PTT:ON</p> <p>Press [PF5] to store the adjustment value after adjustment.</p>							
5. DQT balance adjust	<p>1) Adj item:[W BALW]</p> <p>Adjust:[***]</p> <p>Deviation meter filter</p> <p>LPF:15kHz</p> <p>HPF:OFF</p> <p>2) Adj item:[WL BALW]→ [WLC BALW]→[WC BALW]→ [WCH BALW]→[WH BALW]</p> <p>Adjust:[***]</p> <p>PTT:ON</p> <p>Press [PF5] to store the adjustment value after adjustment.</p>	Deviation meter Oscilloscope AG AF VTVM	Rear panel	ANT	Front panel	[PF3], [PF4]	Make the demodulation waves into square waves.	
•Wide	<p>3) Adj item:[N BALN]</p> <p>Adjust:[***]</p> <p>4) Adj item:[NL BALN]→ [NLC BALN]→[NC BALN]→ [NCH BALN]→[NH BALN]</p> <p>Adjust:[***]</p> <p>PTT:ON</p> <p>Press [PF5] to store the adjustment value after adjustment.</p>		Front panel	MIC jack				
•Narrow	<p>3) Adj item:[N BALN]</p> <p>Adjust:[***]</p> <p>4) Adj item:[NL BALN]→ [NLC BALN]→[NC BALN]→ [NCH BALN]→[NH BALN]</p> <p>Adjust:[***]</p> <p>PTT:ON</p> <p>Press [PF5] to store the adjustment value after adjustment.</p>							

*1: The reference oscillator frequency may drift due to shock (jarring the radio) or operating conditions. We strongly recommend that the oscillator be checked each time the radio is serviced, or at least once per year. Maintenance should only be performed under normal temperatures.

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. Max DEV adjust •Wide	1) Adj item:[W FMWD] Adjust:[***] AG:1kHz/50mV at MIC terminal Deviation meter filter LPF:15kHz HPF:OFF	Deviation meter Oscilloscope AG AF VTVM	Rear panel	ANT	Front panel	[PF3], [PF4]	4.05kHz (According to the larger +, -)	±50Hz
	2) Adj item:[WL FMWD]→ [WLC FMWD]→[WC FMWD]→ [WCH FMWD]→[WH FMWD] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.		Front panel	MIC jack				
	•Narrow		3) Adj item:[N FMND] Adjust:[***] 4) Adj item:[NL FMND]→ [NLC FMND]→[NC FMND]→ [NCH FMND]→[NH FMND] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.					
7. P25 high deviation adjust	1) Adj item:[A HDVA] Adjust:[***] Deviation meter filter LPF:3kHz HPF:OFF 2) Adj item:[AL HDVA]→ [ALC HDVA]→[AC HDVA]→ [ACH HDVA]→[AH HDVA] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.					2827Hz	2771~2883Hz	
8. MIC sensitivity check *2	1) Adj item:[MIC] Adjust:[129] PTT:ON Press [PF5] to store the adjustment value after adjustment.	Deviation meter Oscilloscope AG AF VTVM	Rear panel	ANT			Adjust AG input level to get a standard MOD., 3.0kHz.	5mV±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
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
9. QT deviation adjust •Wide	1) Adj item:[W QTW] Adjust:[***] Deviation meter filter LPF:3kHz HPF:OFF 2) Adj item:[WL QTW]→ [WC QTW]→[WH QTW] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.	Power meter Deviation meter	Rear panel	ANT	Front panel	[PF3], [PF4]	0.75kHz	±50Hz
	•Narrow	3) Adj item:[N QTN] Adjust:[***] 4) Adj item:[WL QTN]→ [WC QTN]→[WH QTN] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.	Oscilloscope AG AF VTVM	Front panel	MIC jack		0.35kHz	±25Hz
10.DQT deviation adjust •Wide	1) Adj item:[W DQTW] Adjust:[***] Deviation meter filter LPF:3kHz HPF:OFF 2) Adj item:[WL DQTW]→ [WC DQTW]→[WH DQTW] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.						0.75kHz	±50Hz
	•Narrow	3) Adj item:[N DQTN] Adjust:[***] 4) Adj item:[WL DQTN]→ [WC DQTN]→[WH DQTN] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.					0.35kHz	±25Hz
11.DTMF deviation adjust •Wide	1) Adj item:[W DTMW] Adjust:[***] Deviation meter filter LPF:15kHz HPF:OFF PTT:ON Press [PF5] to store the adjustment value after adjustment.						3.0kHz	±100Hz
	•Narrow	2) Adj item:[N DTWN] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.					1.5kHz	±50Hz

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
12.MSK deviation adjust •Wide	1) Adj item:[W MSKW] Adjust:[***] Deviation meter filter LPF:15kHz HPF:OFF PTT:ON Press [PF5] to store the adjustment value after adjustment.	Power meter Deviation meter Oscilloscope AG AF VTVM	Rear panel	ANT	Front panel	[PF3], [PF4]	3.0kHz	±100Hz
	•Narrow	2) Adj item:[N MSKN] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.					1.5kHz	±50Hz
13.Single tone deviation adjust •Wide	1) Adj item:[W 2TNW] Adjust:[***] Deviation meter filter LPF:15kHz HPF:OFF PTT:ON Press [PF5] to store the adjustment value after adjustment.						3.0kHz	±100Hz
	•Narrow	2) Adj item:[N 2TNN] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.					1.5kHz	±50Hz

Receiver Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. RX Front-end adjust	[Panel tuning mode] 1) Adj item:[W FEND] Adjust:[***] 2) Adj item:[WL FEND]→ [WLC FEND]→[WC FEND]→ [WCH FEND]→[WH FEND]	S5G	Rear panel	ANT	Front panel	[PF3], [PF4]	Enter the following adjustment values to the transceiver by pressing [PF3] and [PF4] keys. [WL FEND] : 210 K : 200 K2 [WLC FEND] : 175 K : 155 K2 [WC FEND] : 130 K : 115 K2 [WCH FEND] : 95 K : 80 K2 [WH FEND] : 65 K : 50 K2 After setting the adjustment value, press [PF5] key. The adjustment value will be stored in memory.	Note: After replacing the EEPROM (IC701) align RX Front-end.

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks	
		Test-equipment	Unit	Terminal	Unit	Parts	Method		
2. RSSI (Reference) adjust •Wide	1) Adj item:[W RSSI] Adjust:[***] 2) Adj item:[WL RSSI]→ [WC RSSI]→[WH RSSI] Adjust:[***] SSG output:-125dBm(0.126μV) (MOD:1kHz/±3kHz)	SSG AF VTVM Oscilloscope	Rear panel	ANT EXT.SP	Front panel	[PF5]	After input signal from SSG, press [PF5] key. That numeric will be stored in memory.		
	•Narrow								3) Adj item:[N RSSI] Adjust:[***] 4) Adj item:[NL RSSI]→ [NC RSSI]→[NH RSSI] Adjust:[***] SSG output:-125dBm(0.126μV) (MOD:1kHz/1.5kHz)
	•P25								5) Adj item:[A RSSI] Adjust:[***] 6) Adj item:[AL RSSI]→ [AC RSSI]→[AH RSSI] Adjust:[***] SSG output:-125dBm(0.126μV)
3. RSSI (-120dBm) adjust •Wide	1) Adj item:[W LRSI] Adjust:[***] 2) Adj item:[WL LRSI]→ [WC LRSI]→[WH LRSI] Adjust:[***] SSG output:-120dBm(0.22μV) (MOD:1kHz/±3kHz)								
	•Narrow							3) Adj item:[N LRSI] Adjust:[***] 4) Adj item:[NL LRSI]→ [NC LRSI]→[NH LRSI] Adjust:[***] SSG output:-120dBm(0.22μV) (MOD:1kHz/±1.5kHz)	
	•P25							5) Adj item:[A LRSI] Adjust:[***] 6) Adj item:[AL LRSI]→ [AC LRSI]→[AH LRSI] Adjust:[***] SSG output:-120dBm(0.22μV)	

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks	
		Test-equipment	Unit	Terminal	Unit	Parts	Method		
4. RSSI (-70dBm) adjust •Wide	1) Adj item:[W HRSI] Adjust:[***] 2) Adj item:[WL HRSI]→ [WC HRSI]→[WH HRSI] Adjust:[***] SSG output:-70dBm(70.8μV) (MOD:1kHz/±3kHz)	SSG AF VTVM Oscilloscope	Rear panel	ANT EXT.SP	Front panel	[PF5]	After input signal from SSG, press [PF5] key. That numeric will be stored in memory.		
	•Narrow								3) Adj item:[N HRSI] Adjust:[***] 4) Adj item:[NL HRSI]→ [NC HRSI]→[NH HRSI] Adjust:[***] SSG output:-70dBm(70.8μV) (MOD:1kHz/±1.5kHz)
	•P25								5) Adj item:[A HRSI] Adjust:[***] 6) Adj item:[AL HRSI]→ [AC HRSI]→[AH HRSI] Adjust:[***] SSG output:-70dBm(70.8μV)
5. AF level Setting	[Panel test mode] 1) CH-Sig:1-1 SSG output:-47dBm(1mV) (MOD:1kHz/±3kHz)	SSG DVM AF VTVM 4Ω dummy load	Rear panel	ANT EXT.SP	Front panel	Volume Knob	Turn the Volume Knob to obtain 2.0V AF output.	2.0V±0.1V	
6. Sensitivity Check •Wide	1) CH-Sig:1-1 SSG output:-117dBm(0.32μV) (MOD:1kHz/±3kHz)	SSG AF VTVM Oscilloscope	Rear panel	ANT EXT.SP			Check	12dB SINAD or more	
	2) CH-Sig:2-1								
	3) CH-Sig:3-1								
	•Narrow								4) CH-Sig:1-1 SSG output:-117dBm(0.32μV) (MOD:1kHz/±1.5kHz)
	5) CH-Sig:2-1								
	6) CH-Sig:3-1								

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. Squelch (Threshold) adjust •Wide	1) Adj item:[W SQOW] Adjust:[***] 2) Adj item:[WL SQOW]← [WC SQOW]→[WH SQOW] Adjust:[***] SSG output:12dB SINAD level -3dB (MOD:1kHz/±3kHz)	SSG AF VTVM Oscilloscope	Rear panel	ANT EXT.SP	Front panel	[PF5]	After input signal from SSG, press [PF5] key. That numeric will be stored in memory.	After adjusting SQL, check SQL open/close. [Panel test mode] 1) CH-Sig:1-1 SSG 12dB SINAD or less:Open SSG -130dBm(0.07μV):Close 2) CH-Sig:2-1 SSG 12dB SINAD or less:Open SSG -130dBm(0.07μV):Close 3) CH-Sig:3-1 SSG 12dB SINAD or less:Open SSG -130dBm(0.07μV):Close
	•Narrow	3) Adj item:[N SQON] Adjust:[***] SSG output:12dB SINAD level -3dB (MOD:1kHz/±1.5kHz)					After adjusting SQL, check SQL open/Close. [Panel test mode] 1) CH-Sig:1-1 SSG 12dB SINAD or less:Open SSG -130dBm(0.07μV):Close 2) CH-Sig:2-1 SSG 12dB SINAD or less:Open SSG -130dBm(0.07μV):Close 3) CH-Sig:2-1 SSG 12dB SINAD or less:Open SSG -130dBm(0.07μV):Close	

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
8. Squelch (Tight) adjust •Wide	1) Adj item:[W SQTW] Adjust:[***] 2) Adj item:[WL SQTW]→ [WC SQTW]→[WH SQTW] Adjust:[***] SSG output:12dB SINAD level +5dB (MOD:1kHz/±3kHz)	SSG AF VTVM Oscilloscope	Rear panel	ANT EXT.SP	Front panel	[PF5]	After input signal from SSG, press [PF5] key. That numeric will be stored in memory.	After adjusting SQL, check SQL open/close. [Panel test mode] 1) CH-Sig:1-1 SSG 16dB SINAD or more:Open SSG 12dB SINAND level -4dB:Close 2) CH-Sig:2-1 SSG 16dB SINAD or more:Open SSG 12dB SINAD level -4dB:Close 3) CH-Sig:3-1 SSG 16dB SINAD or more:Open SSG 12dB SINAD level -4dB:Close
	•Narrow	3) Adj item:[N SQTN] Adjust:[***] SSG output:12dB SINAD level +6.5dB (MOD:1kHz/±1.5kHz)					After adjusting SQL, check SQL open/close. [Panel test mode] 1) CH-Sig:1-1 SSG 16dB SINAD or more:Open SSG 12dB SINAD level -4dB:Close 2) CH-Sig:2-1 SSG 16dB SINAD or more:Open SSG 12dB SINAD level -4dB:Close 3) CH-Sig:3-1 SSG 16dB SINAD or more:Open SSG 12dB SINAD level -4dB:Close	
9. BER (Bit Error Rate) check	[Panel test mode] 1) CH-sig:1-20 SSG output:-117dBm(0.32μV) (C4FM) (1011Hz Tone Test Pattern)	Digital radio tester				Check	5% or less	

TERMINAL FUNCTION

Final unit (X45-3790-XX)

Pin No.	Name	I/O	Description
CN1 (to TX-RX unit CN151)			
1	TX	I	TX drive input
CN2 (to TX-RX unit CN200)			
1	RX	O	RX signal output
CN9 (to TX-RX unit CN601)			
1	FTEMP2	O	Final unit temperature 2
2	FTEMP1	O	Final unit temperature 1
3	8T	-	8V input during transmission
4	8T	-	8V input during transmission
5	E	-	GND
6	PC	I	TX power control voltage
CN13 (to Control unit CN702)			
1	E	-	GND
2	+B	O	Power supply output (13.6V±15%)
3	+B	O	Power supply output (13.6V±15%)
CN14 (to DC cable)			
1	+B	I	Power supply input (13.6V±15%)

Control unit (X53-4120-10)

Pin No.	Name	I/O	Description
CN702 (to Final unit CN13)			
1	+B	I	Power supply input (13.6V±15%)
2	+B	I	Power supply input (13.6V±15%)
3	E	-	GND
CN724 (to KRK-6DH)			
1	AFO	O	RX audio signal output for remote head 2
2	DE3	I/O	Detection signal
3	E	-	GND
4	EI	O	Enable of shift register
5	CLK	O	Clock output
6	DAT	O	Data output
7	RESET	O	Reset signal output
8	5C	-	Common 5V
9	PSC	I/O	Power switch control signal
10	CS	O	Chip select of D/A converter
CN728 (to D-SUB 25-pin connector)			
1	NC	-	No connection
2	SB	O	Switched B (13.6V±15%)
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	E	-	GND
11	MI2	I	External MIC input
12	DEO	O	Detected signal output
13	E	-	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	E	-	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	E	-	GND
27~30	NC	-	No connection
CN744/Solder land (to VGS-1)			
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	CLK	O	Clock output
6	EN	O	Enable output (Active Low)
7	USEL	O	UART speed select (H:115200bps, L:19200bps)

TERMINAL FUNCTION

Pin No.	Name	I/O	Description
8	VRST	O	Reset signal output
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
15~25	NC	-	No connection
26	8C	-	Common 8V
CN755/Solder land (to ANI board)			
1	BUSY	O	BUSY signal output (L:TX) $L \leq 0.4V$, $H \geq 4.6V$ / 30k Ω load
2	AKEY	I	TX Control signal input (Active Low) $L \leq 0.8V$, $H \geq 2.6V$
3~5	NC	-	No connection
6	PTOA	O	PTT signal output (L:PTT ON) $L \leq 0.4V$, $H \geq 4.6V$ / 30k Ω load
7	NC	-	No connection
8	EMG	O	Emergency signal output (L:Operated) $L \leq 0.4V$, $H \geq 4.6V$ / 30k Ω load
9,10	E	-	GND
11,12	NC	-	No connection
13	E	-	GND
14	5C	-	Common 5V (Standby:3.5mA / Encoding:35mA)
15	STON	I	Side tone input (1kHz/5Vp-p)
16	ATXI	I	Data signal input (Adjustable from 0V to 4.5Vp-p)
17	TCONT	I	Speaker mute signal input (L:Unmute) $L \leq 0.8V$, $H \geq 4.2V$
18	NC	-	No connection
19	AINH	I	MIC mute signal input (L:Mute) $L \leq 0.8V$, $H \geq 4.2V$
20	AUX I/O	I	Emergency signal input (Active Low) $L \leq 0.8V$, $H \geq 4.2V$
21~25	NC	-	No connection
26	8C	-	Common 8V
CN771/Solder land (to Scrambler board)			
1	BC1	O	Scramble code signal output 1 $L \leq 0.4V$, $H \geq 4.6V$ / 30k Ω load
2	BC2	O	Scramble code signal output 2 $L \leq 0.4V$, $H \geq 4.6V$ / 30k Ω load
3	LOK	I/O	for LOK customize
4	PTOS	O	TX signal output (L:TX) $L \leq 0.4V$, $H \geq 4.6V$ / 30k Ω load
5	NC	-	No connection
6	ECHO	I/O	Echo PTT
7	NC	-	No connection
8	BC4	O	Scramble code signal output 4 $L \leq 0.4V$, $H \geq 4.6V$ / 30k Ω load
9,10	E	-	GND
11,12	NC	-	No connection
13	E	-	GND

Pin No.	Name	I/O	Description
14	5C	-	Common 5V
15~19	NC	-	No connection
20	AC	O	Scramble control signal output (L:On, H:Off) $L \leq 0.4V$, $H \geq 4.6V$ / 30k Ω load
21	TXO	O	MIC signal output $Z_o \leq 1k\Omega$ (85mVp-p typ.)
22	RXEO	O	AUDIO signal output $Z_o \leq 100\Omega$ (1.2Vp-p typ.)
23	RXEI	I	AUDIO signal input $Z_i = 27k\Omega$ (1.2Vp-p typ.)
24	STXI	I	MIC signal input $Z_o = 100k\Omega$
25	BC3	O	Scramble code signal output 3 $L \leq 0.4V$, $H \geq 4.6V$ / 30k Ω load
26	8C	-	Common 8V
CN782 (to TX-RX unit CN600)			
1	E	-	GND
2	CV	I	Control voltage for 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 detection of PLL
8	EP	O	Enable of PLL
9	WN2	-	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
12~15	8C	-	Common 8V
16	DAT	O	Data output
17	SOE	O	Enable of Shift Register 3
18	CLK	O	Clock output
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 input
24	E	-	GND
25	PC	O	TX power control voltage
26	E	-	GND
27~29	IF_IN	I	IF signal
30~32	E	-	GND
33	ASQL	I	Analog squelch signal input
34	RSSI	I	RSSI signal input
35	TV	O	Tuning voltage signal output for RX BPF
36	E	-	GND
CN783 (to Accessory 9-pin connector)			
1	IGN	I	Ignition sense input
2	E	-	GND
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)

TERMINAL FUNCTION

Pin No.	Name	I/O	Description
7	ES2	O	BTL output for external speaker A
8	ES1	O	BTL output for external speaker A
9	IRS	I	Remote speaker switch
CN950 (for production)			
1~20			
CN951 (to Display unit CN1)			
1	ES2	O	Remote speaker output
2	IRS	O	Remote speaker output
3	SB	O	Switched B (13.6V±15%)
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 or head 2 signal output
8	RESET	O	Reset signal output
9	GND	-	GND
10	MIC	I	MIC signal input
11	ME	-	MIC GND

TX-RX unit (X57-7270-XX)

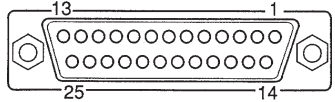
Pin No.	Name	I/O	Description
CN150			
1	TX	O	TX drive output
CN151 (to Final unit CN1)			
1	TX	O	TX drive output
CN200 (to Final unit CN2)			
1	RX	I	RX signal input
CN202 (for MCF Adjustment)			
1	MCFin	I	MCF input
2	E	-	GND
CN207 (for MCF Adjustment)			
1	MCFout	O	MCF output
2	E	-	GND
CN600 (to Control unit CN782)			
1	E	-	GND
2	TV	I	Tuning voltage signal input for RX BPF
3	RSSI	O	RSSI signal output
4	ASQL	O	Analog squelch signal output
5~7	E	-	GND
8~10	IF_IN	O	IF signal
11	E	-	GND
12	PC	I	TX power control voltage
13	E	-	GND
14	DET	O	Detection signal output
15	E	-	GND
16	Vref	-	Reference voltage
17	8T	-	8V input during transmission
18	STRB3	I	Chip select of shift register 3
19	CLK	I	Clock input
20	SOE3	I	Enable of shift register 3
21	DAT	I	Data input
22~25	8C	-	Common 8V

Pin No.	Name	I/O	Description
26	MB	I	Modulation and frequency control signal for VCXO
27	MO	I	Modulation signal for VCO
28	WN2	-	Switch of ceramic filter (H:Wide, L:Narrow)
29	EP	I	Enable of PLL
30	UL	O	Lock detection of PLL
31	L2FT	I	Tuning Frequency of 2nd local
32	PCS	I	Chip Select of potentiometer
33	FTEMP1	O	Final unit temperature 1
34	FTEMP2	O	Final unit temperature 2
35	CV	O	Control voltage of VCO
36	E	-	GND
CN601 (to Final unit CN9)			
1	PC	O	TX power control voltage
2	E	-	GND
3	8T	-	8V output during transmission
4	8T	-	8V output during transmission
5	FTEMP1	I	Final unit temperature 1
6	FTEMP2	I	Final unit temperature 2

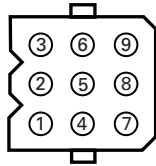
TERMINAL FUNCTION

D-SUB 25-pin connector

Pin No.	Name	I/O	Description
1	NC	–	No connection
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	I/O	Auxiliary input/output 9 (FPU selectable) Active Low with $47k\Omega$ pull-up to 5V $L \leq 0.8V$, $H \geq 4.2V$
5	DI	I	Data signal input $Z_i \geq 10k\Omega$ Deviation: 60% deviation or more (at 1kHz/2Vp-p) Frequency response: +3~-3dB (20Hz~9.6kHz) (0dB: 1kHz, 60% deviation)
6	MI2	I	External MIC input $Z_i = 600\Omega$ Deviation: 60% deviation (at 1kHz/5mV $\pm 2mV$ input) Frequency response: Compliance with TIA/EIA-603
7	E	–	GND
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 CMOS Level $L \leq 0.7V$, $H \geq 4.2V$ / $25k\Omega$ load, $Z_o \leq 1k\Omega$
10	RXD3	I	Serial data input 3 CMOS Level 0-5V max. $L \leq 0.8V$, $H \geq 4.2V$
11	E	–	GND
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	I	Switched B (13.6V $\pm 15\%$) 2A max.
15	AUXO 2	O	Auxiliary output 2 (FPU selectable) Active Low: Open Collector (500mA max.)
16	AUXO 1	O	Auxiliary output 1 (FPU selectable) Active Low: Open Collector (500mA max.)
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 (at 1kHz 60% deviation/-53dBm) (Wide) 1.3Vp-p typ. (Narrow) 1.1Vp-p typ.
18	E	–	GND

Pin No.	Name	I/O	Description
19	DEO	O	Detected signal output $Z_o \leq 600k\Omega$ 500mVp-p (at 1kHz 60% deviation/-53dBm) Frequency response (0dB: 1kHz 60% deviation) (Wide) 20Hz~4.8kHz: +1/-6dB, 4.8kHz~8.5kHz: +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 GND 

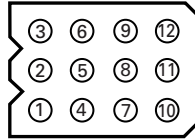
Accessory 9-pin connector

Pin No.	Name	I/O	Description
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 output 1 (1A max.)
5	HR2	O	Horn alert signal output 2 (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	–	GND 

TERMINAL FUNCTION

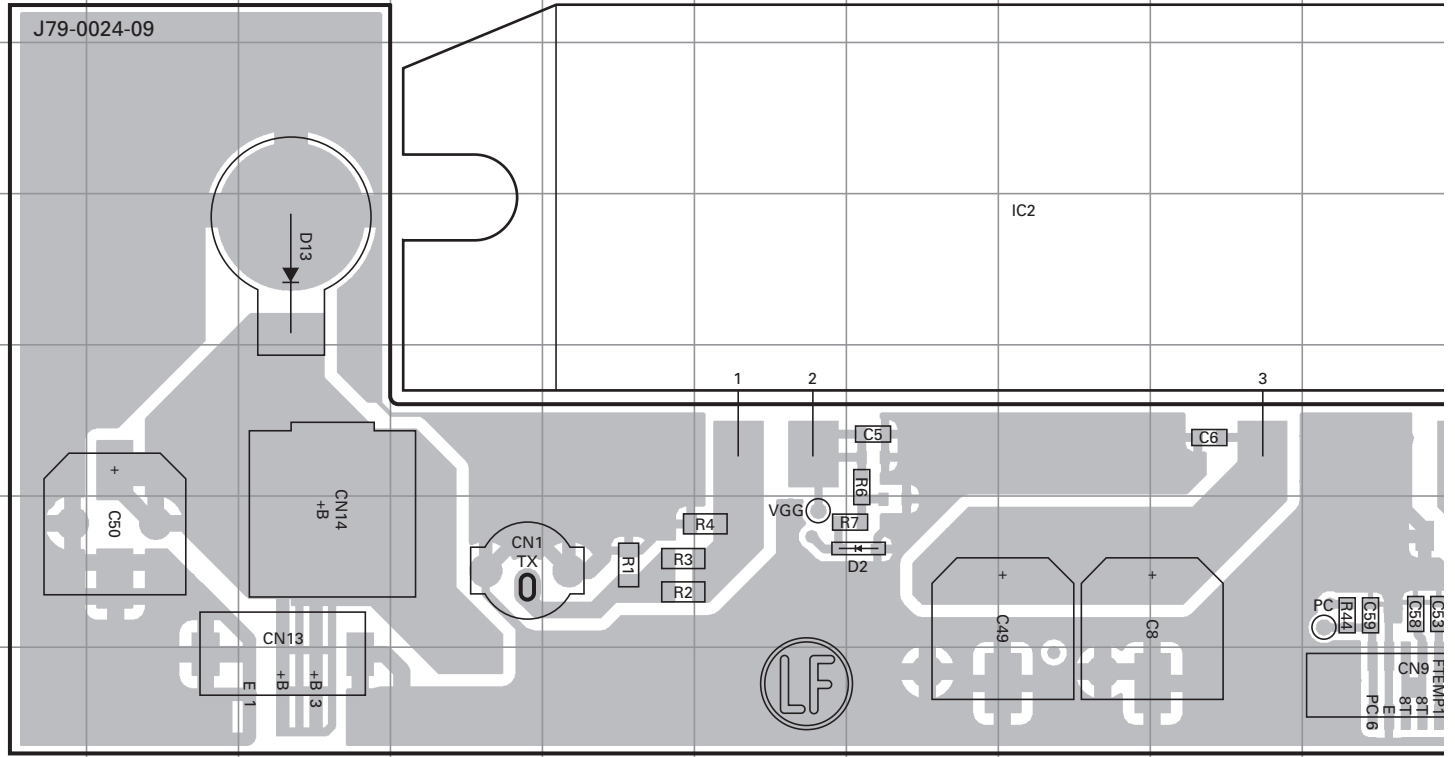
Accessory 12-pin connector (Remote kit)

Pin No.	Name	I/O	Description
1	IGN	I	Ignition sense input
2	SB	O	Switched B (13.6V±15%)
3	E	-	GND
4	MIC	I	MIC signal input / 60% deviation at 1kHz/5mV±2mV input
5	ME	-	MIC GND
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

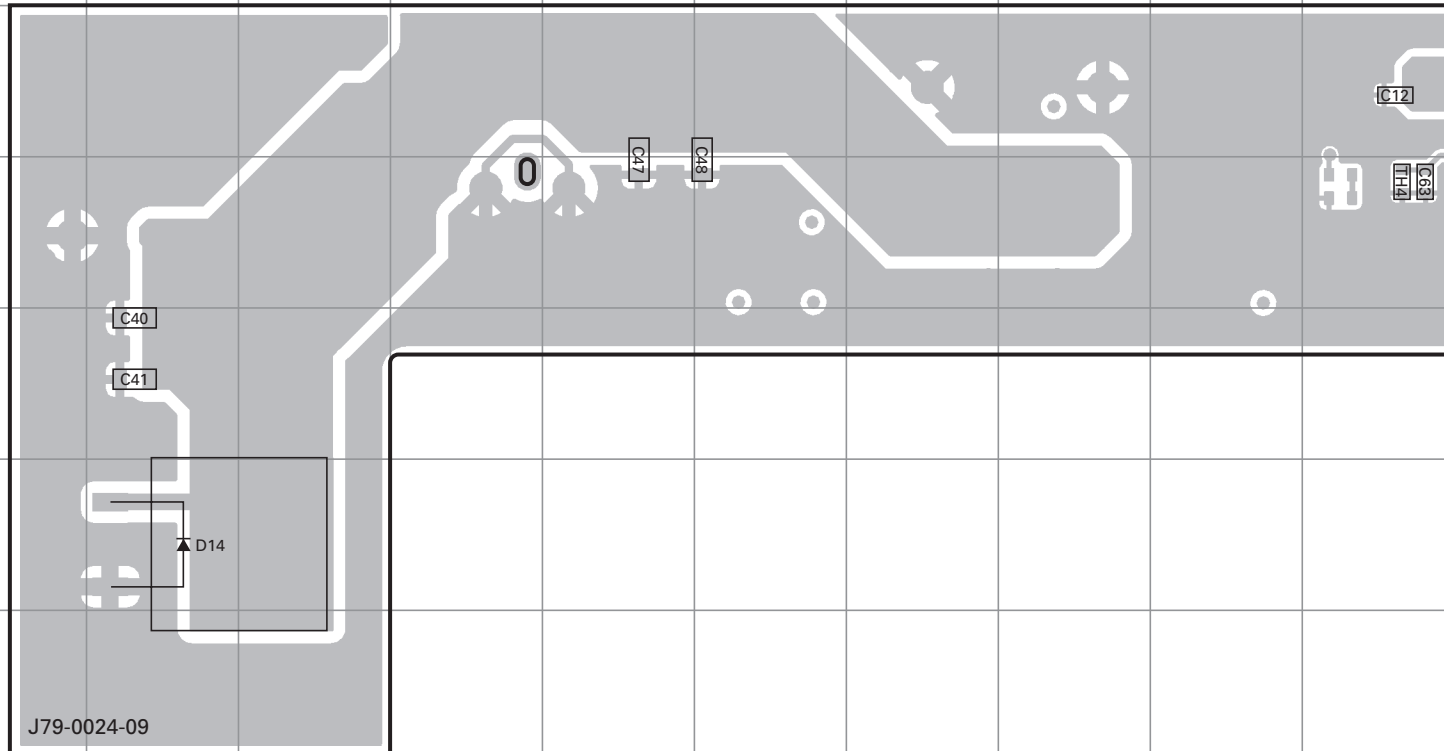


TK-5810(B) PC BOARD

FINAL UNIT (X45-3790-XX) -10 : K -11 : K2
Component side view (J79-0024-09)

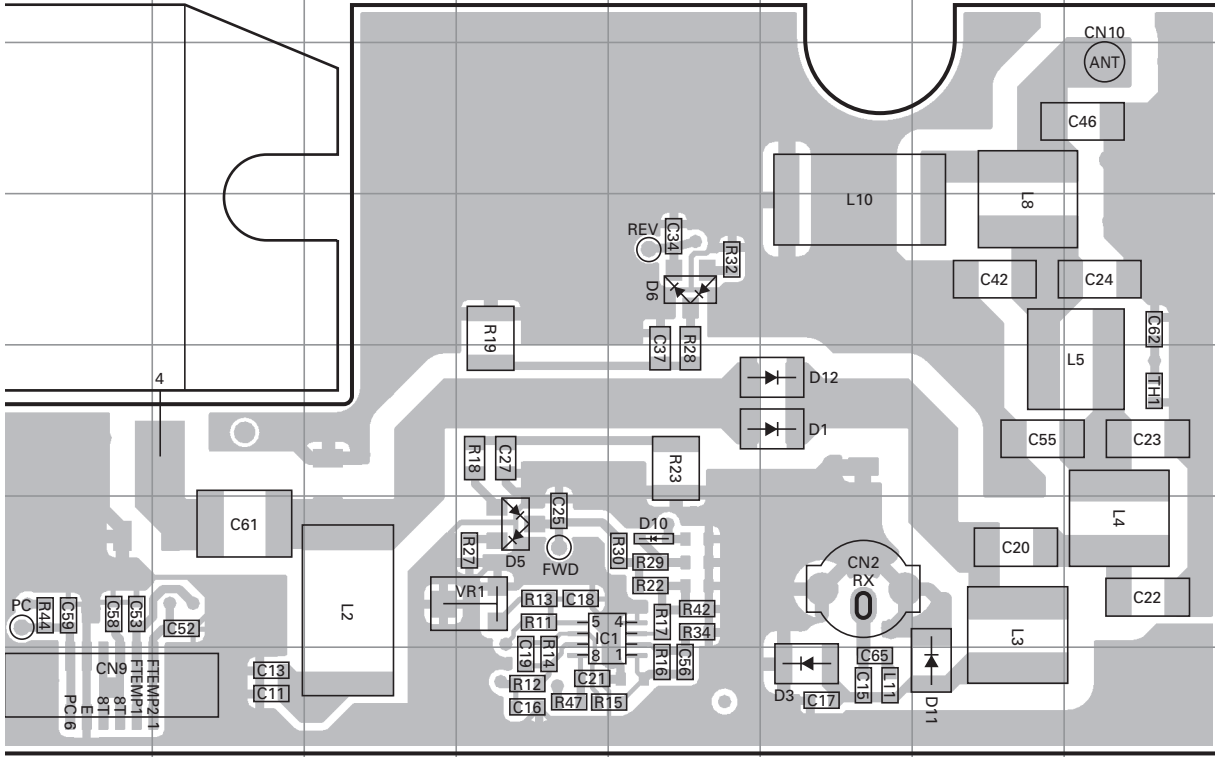


FINAL UNIT (X45-3790-XX) -10 : K -11 : K2
Foil side view (J79-0024-09)

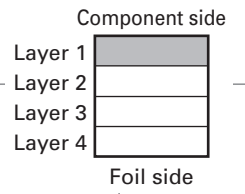


PC BOARD TK-5810(B)

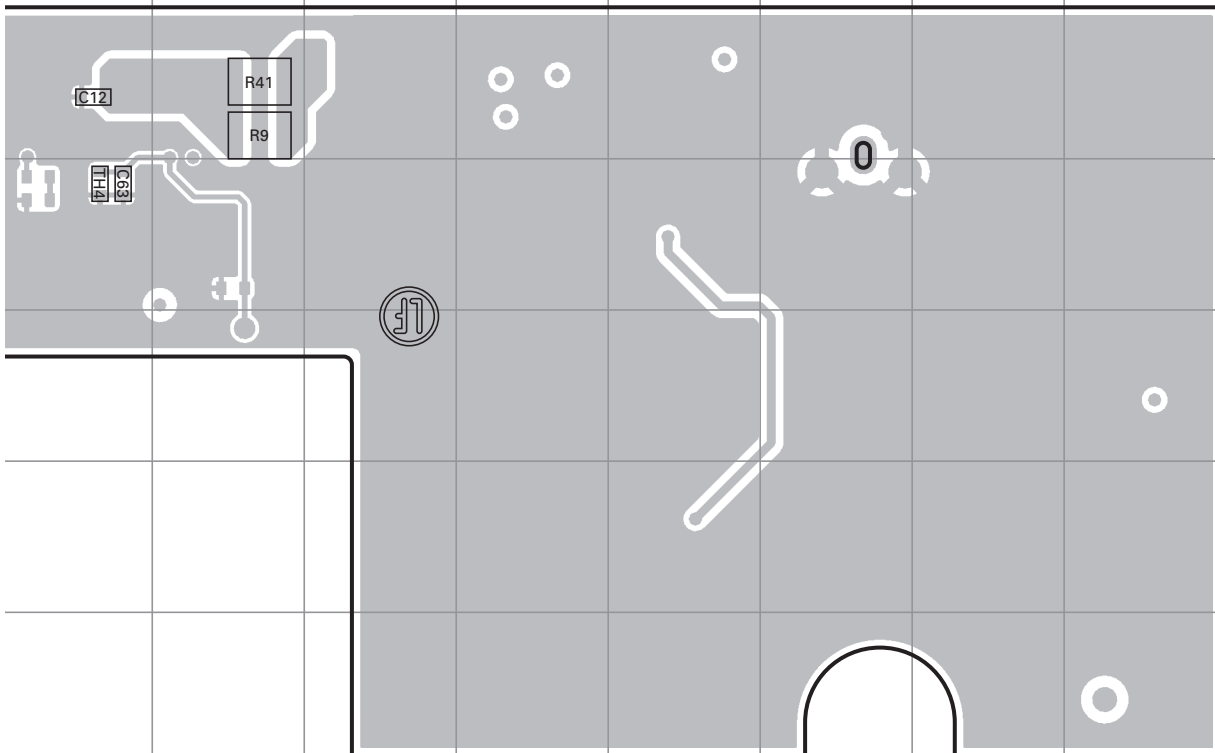
FINAL UNIT (X45-3790-XX) -10 : K -11 : K2
Component side view (J79-0024-09)



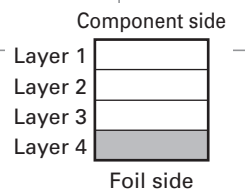
Ref. No.	Address
IC1	6M
IC2	4H
D1	5O
D2	6G
D3	7O
D5	6M
D6	4N
D10	6N
D11	7P
D12	5O
D13	4C



FINAL UNIT (X45-3790-XX) -10 : K -11 : K2
Foil side view (J79-0024-09)



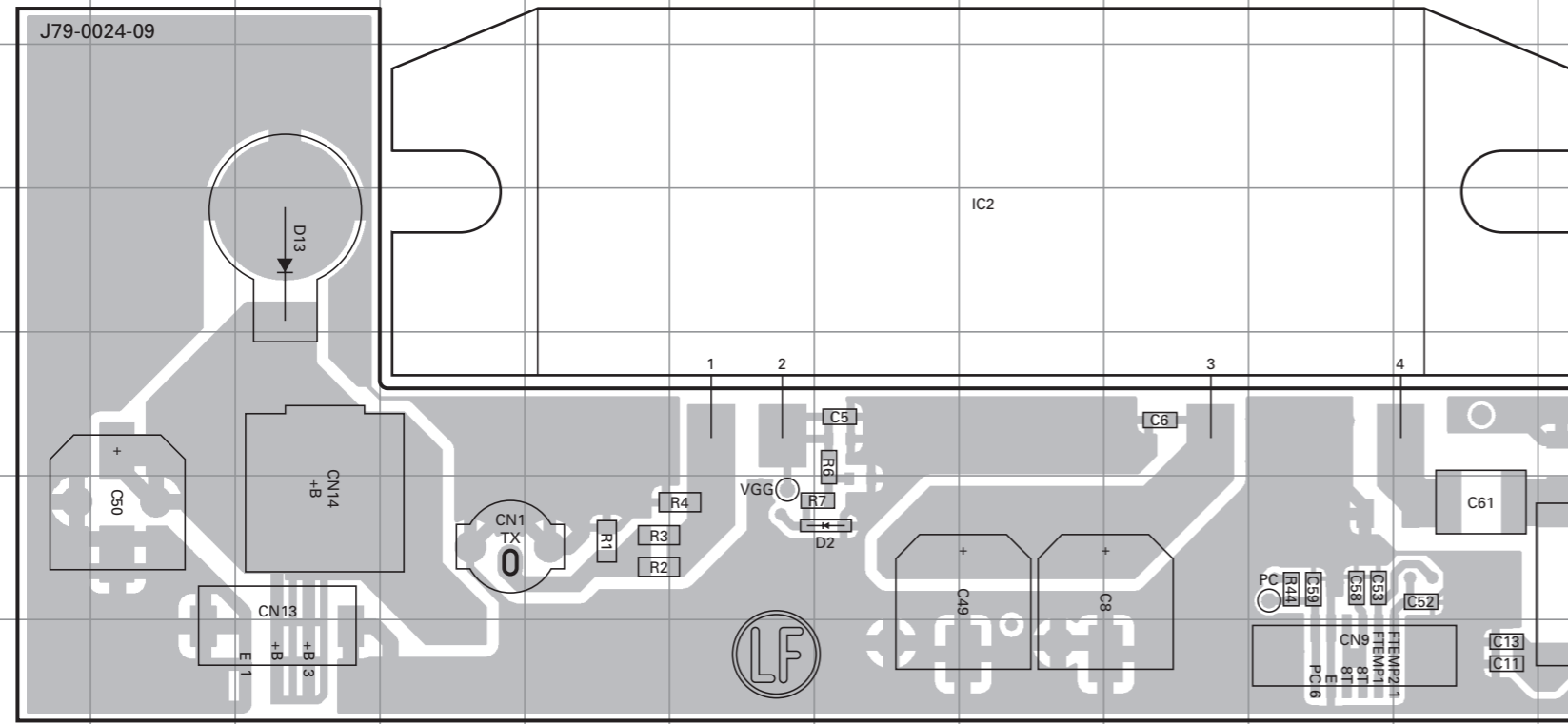
Ref. No.	Address
D14	12B



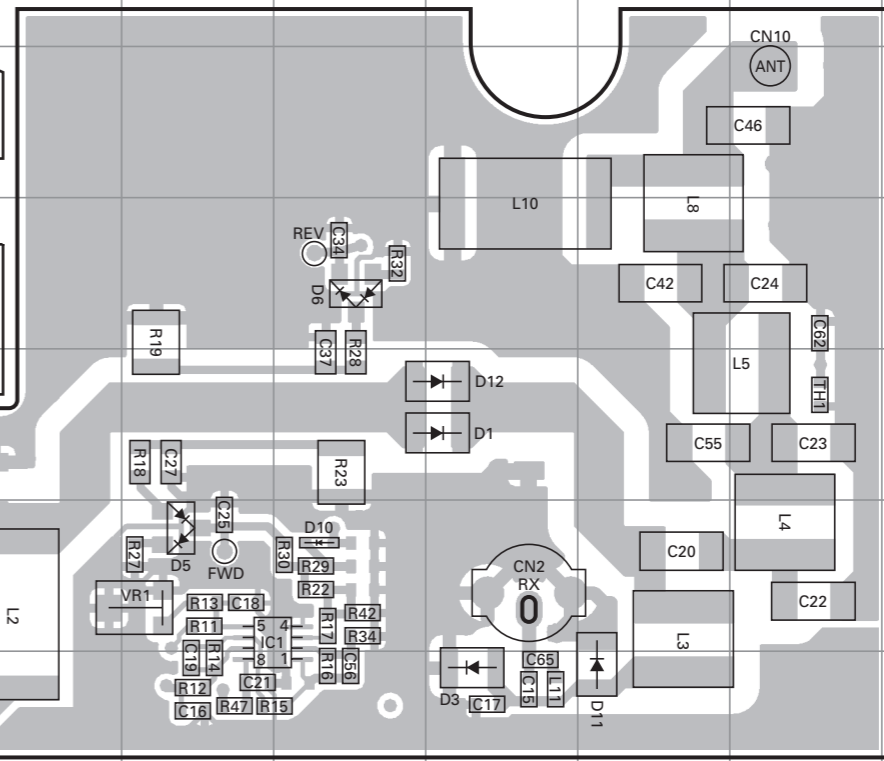
TK-5810(B) PC BOARD

PC BOARD TK-5810(B)

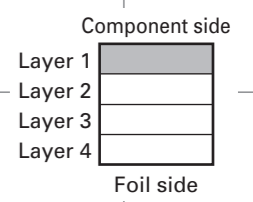
FINAL UNIT (X45-3790-XX) -10 : K -11 : K2
Component side view (J79-0024-09)



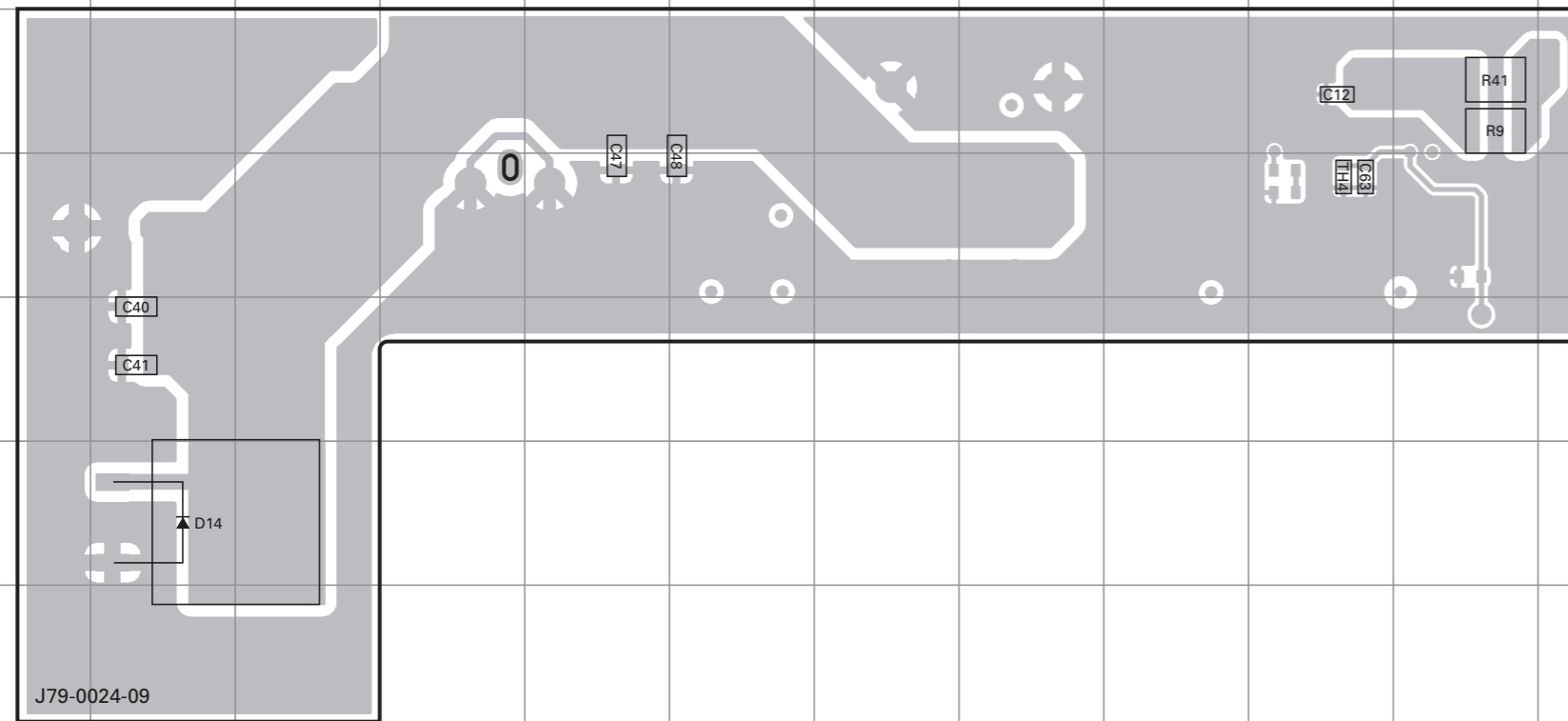
FINAL UNIT (X45-3790-XX) -10 : K -11 : K2
Component side view (J79-0024-09)



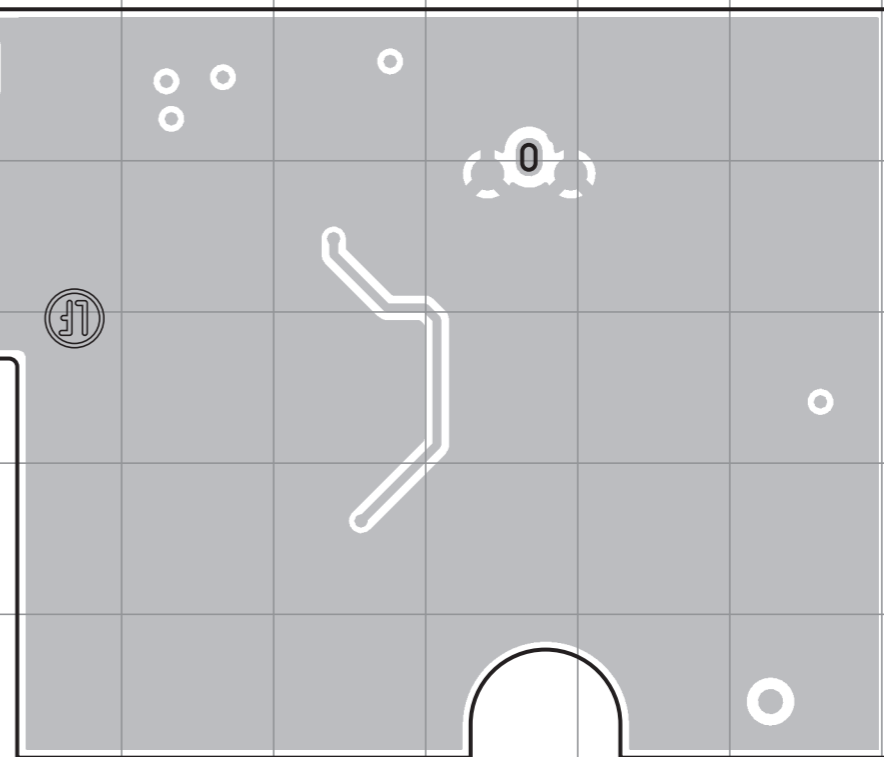
Ref. No.	Address
IC1	6M
IC2	4H
D1	5O
D2	6G
D3	7O
D5	6M
D6	4N
D10	6N
D11	7P
D12	5O
D13	4C



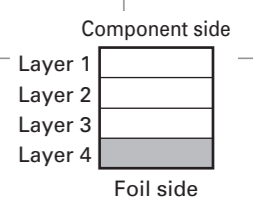
FINAL UNIT (X45-3790-XX) -10 : K -11 : K2
Foil side view (J79-0024-09)



FINAL UNIT (X45-3790-XX) -10 : K -11 : K2
Foil side view (J79-0024-09)



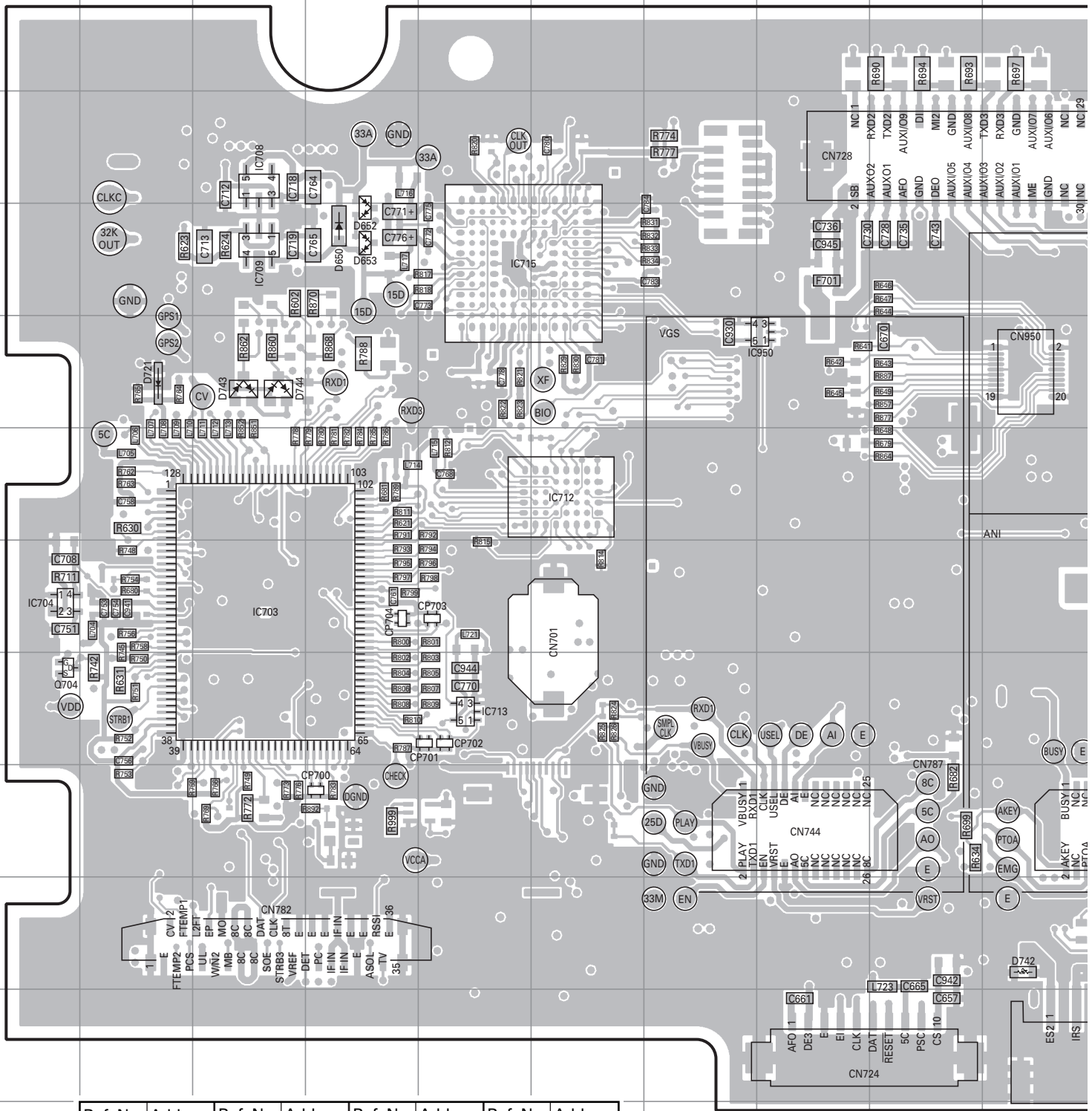
Ref. No.	Address
D14	12B



TK-5810(B) PC BOARD

CONTROL UNIT (X53-4120-10)

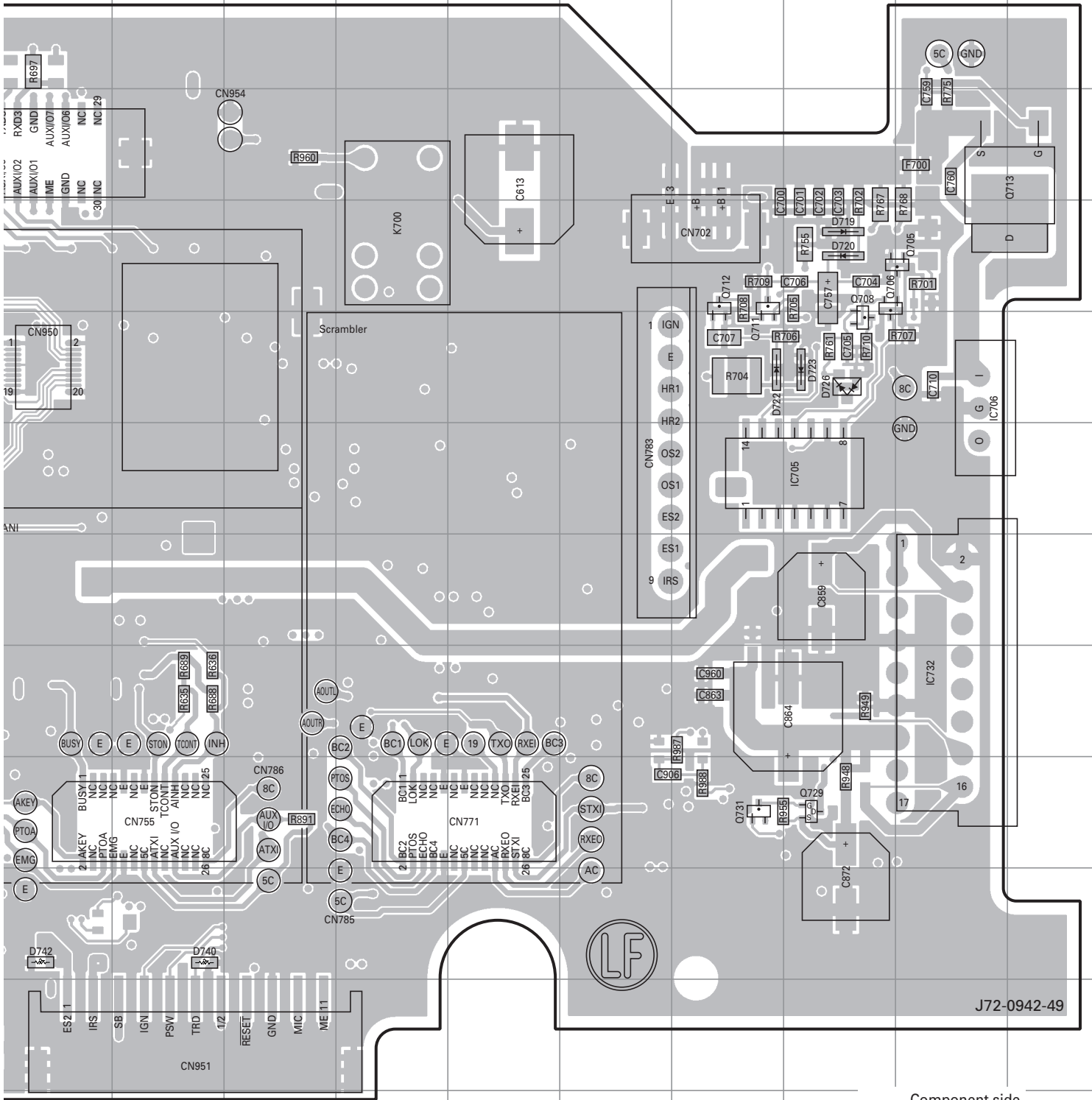
Component side view (J72-0942-49)



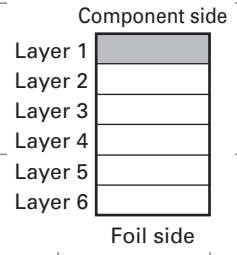
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC703	7C	IC732	8R	Q729	9Q	D723	5Q
IC704	7A	IC950	5H	Q731	9P	D726	5Q
IC705	6Q	Q704	8A	D650	4D	D740	10K
IC706	5R	Q705	4R	D652	4D	D742	10J
IC708	3C	Q706	4Q	D653	4D	D743	5C
IC709	4C	Q708	5Q	D719	4Q	D744	5C
IC712	6F	Q711	4P	D720	4Q		
IC713	8E	Q712	4P	D721	5B		
IC715	4E	Q713	3S	D722	5P		

PC BOARD TK-5810(B)

CONTROL UNIT (X53-4120-10)
Component side view (J72-0942-49)



J72-0942-49

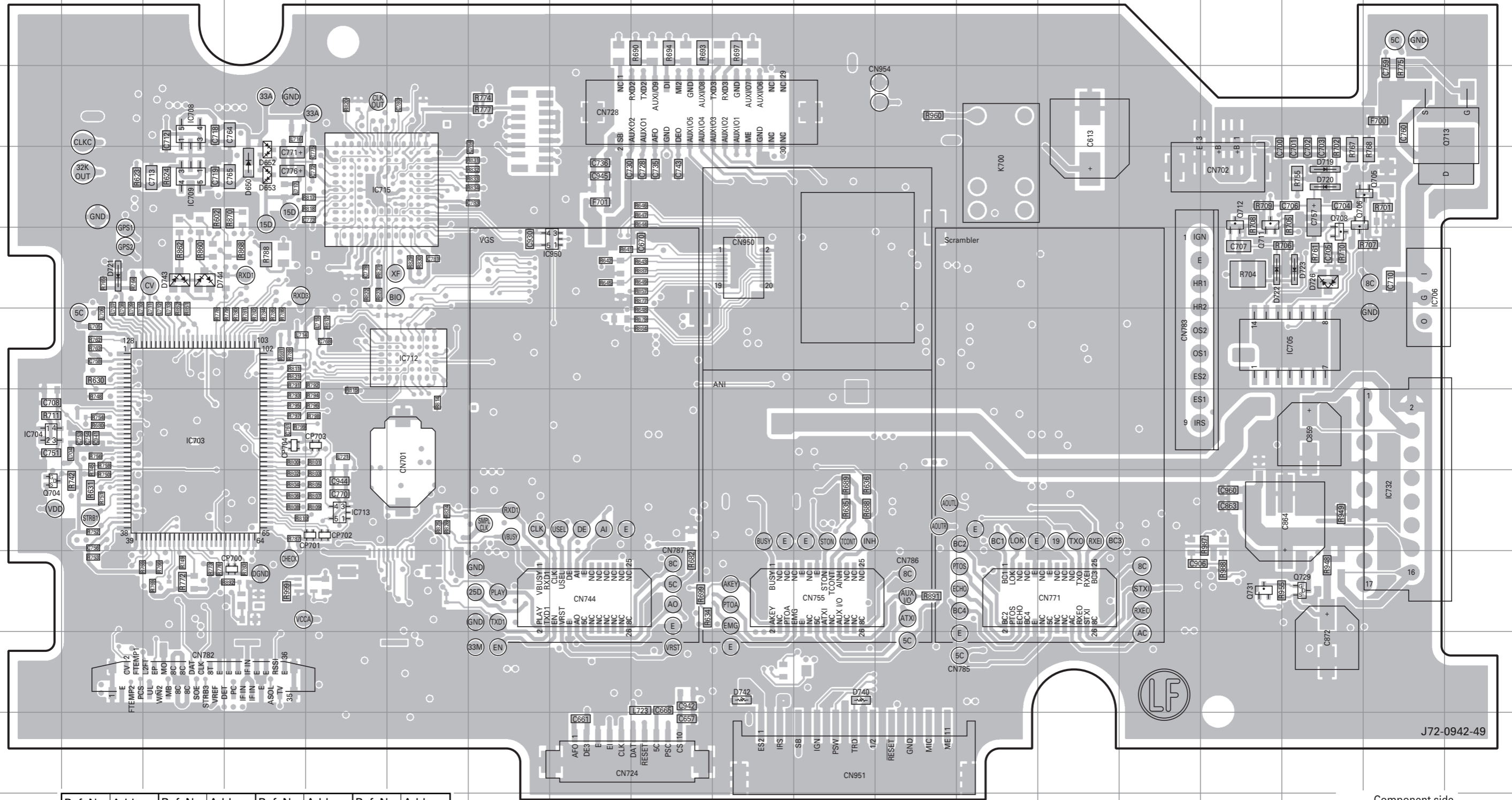


TK-5810(B) PC BOARD

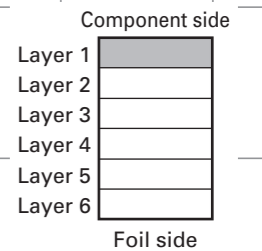
CONTROL UNIT (X53-4120-10)
Component side view (J72-0942-49)

PC BOARD TK-5810(B)

CONTROL UNIT (X53-4120-10)
Component side view (J72-0942-49)



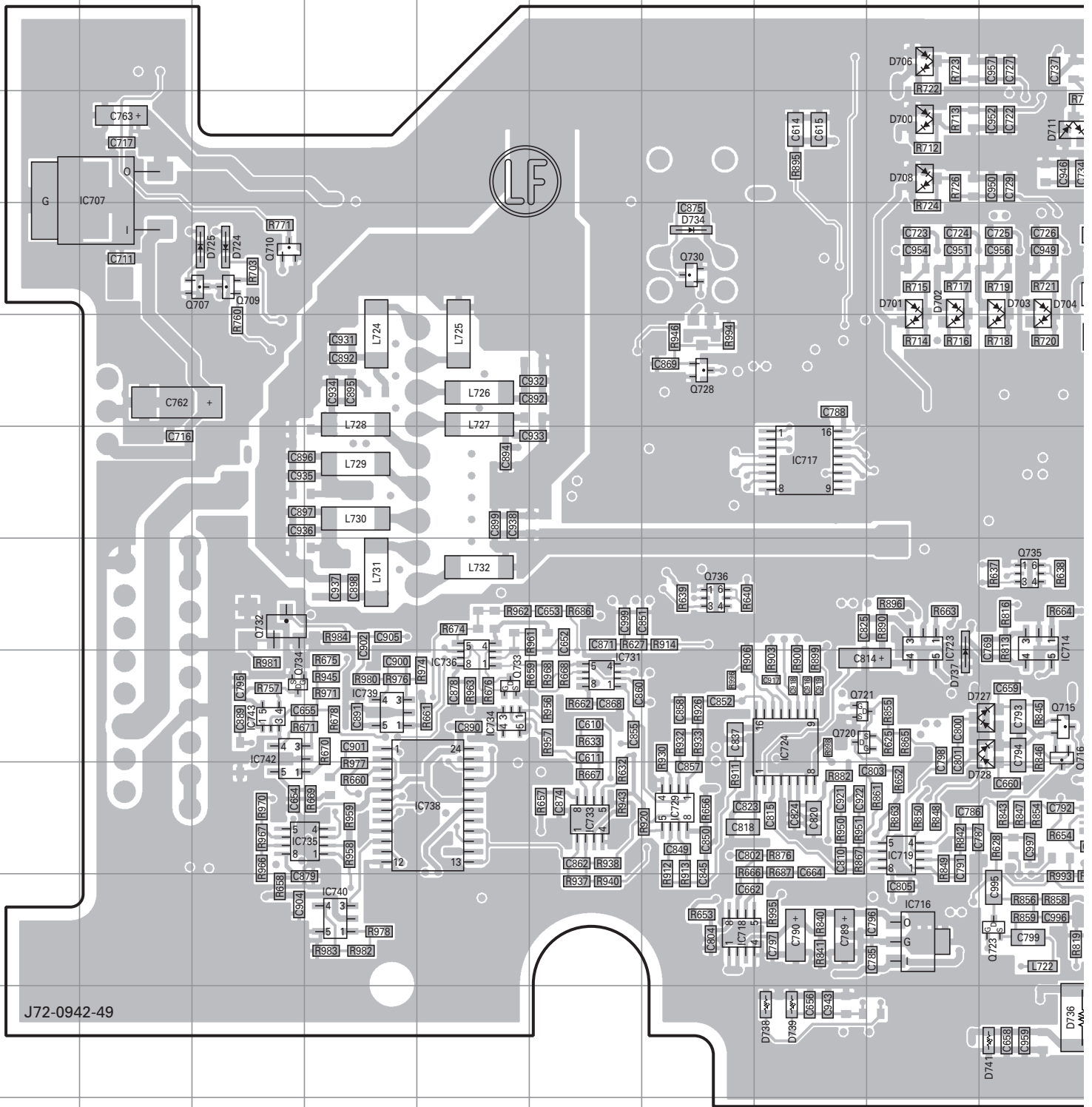
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC703	7C	IC732	8R	Q729	9Q	D723	5Q
IC704	7A	IC950	5H	Q731	9P	D726	5Q
IC705	6Q	Q704	8A	D650	4D	D740	10K
IC706	5R	Q705	4R	D652	4D	D742	10J
IC708	3C	Q706	4Q	D653	4D	D743	5C
IC709	4C	Q708	5Q	D719	4Q	D744	5C
IC712	6F	Q711	4P	D720	4Q		
IC713	8E	Q712	4P	D721	5B		
IC715	4E	Q713	3S	D722	5P		



TK-5810(B) PC BOARD

CONTROL UNIT (X53-4120-10)

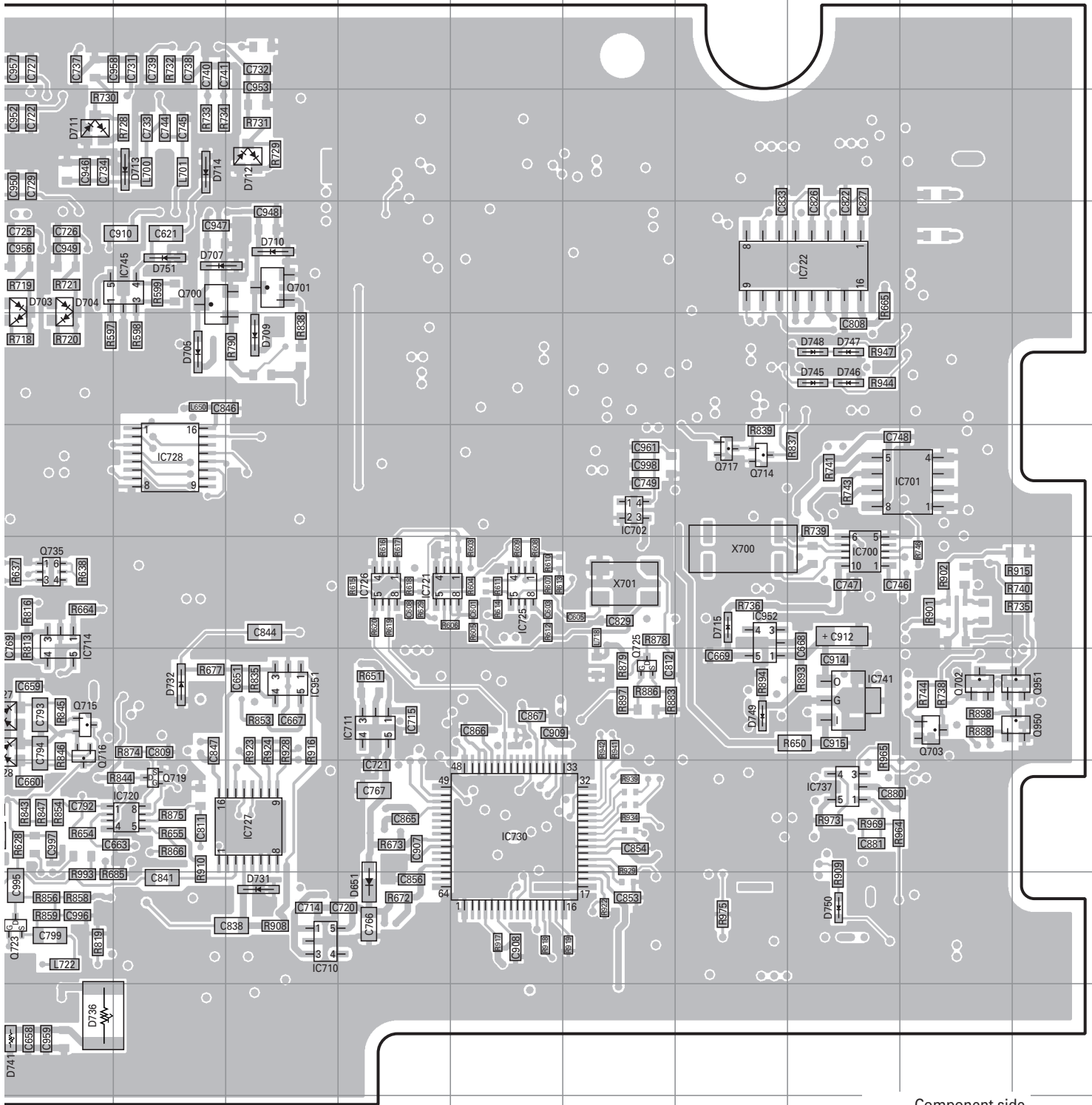
Foil side view (J72-0942-49)



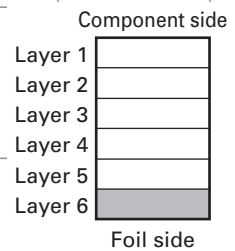
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC700	7Q	IC716	10I	IC723	7I	IC730	9N	IC738	9E	IC951	8L	Q709	4C	Q720	8H
IC701	6R	IC717	6H	IC724	8H	IC731	8F	IC739	8D	IC952	7P	Q710	4C	Q721	8H
IC702	6O	IC718	10G	IC725	7N	IC733	9F	IC740	10D	Q700	4K	Q714	6P	Q723	10J
IC707	3B	IC719	9I	IC726	7M	IC734	8E	IC741	8Q	Q701	4L	Q715	8J	Q725	8O
IC710	10L	IC720	9K	IC727	9L	IC735	9D	IC742	8C	Q702	8R	Q716	8J	Q728	5G
IC711	8M	IC721	7M	IC728	6K	IC736	8E	IC743	8C	Q703	8R	Q717	6P	Q730	4G
IC714	7J	IC722	4Q	IC729	9G	IC737	9Q	IC745	4K	Q707	4C	Q719	9K	Q732	7C
														D651	10M

PC BOARD TK-5810(B)

CONTROL UNIT (X53-4120-10)
Foil side view (J72-0942-49)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
Q733	8E	D700	3I	D707	4K	D714	4K	D732	8K	D745	5Q
Q734	8C	D701	4I	D708	3I	D715	7P	D734	4G	D746	5Q
Q735	7J	D702	4I	D709	5L	D724	4C	D736	11J	D747	5Q
Q736	7G	D703	4J	D710	4L	D725	4C	D737	8I	D748	5Q
Q950	8S	D704	4J	D711	3J	D727	8J	D738	11H	D749	8P
Q951	8S	D705	5K	D712	3L	D728	8J	D739	11H	D750	10Q
D651	10M	D706	2I	D713	4K	D731	10L	D741	11J	D751	4K

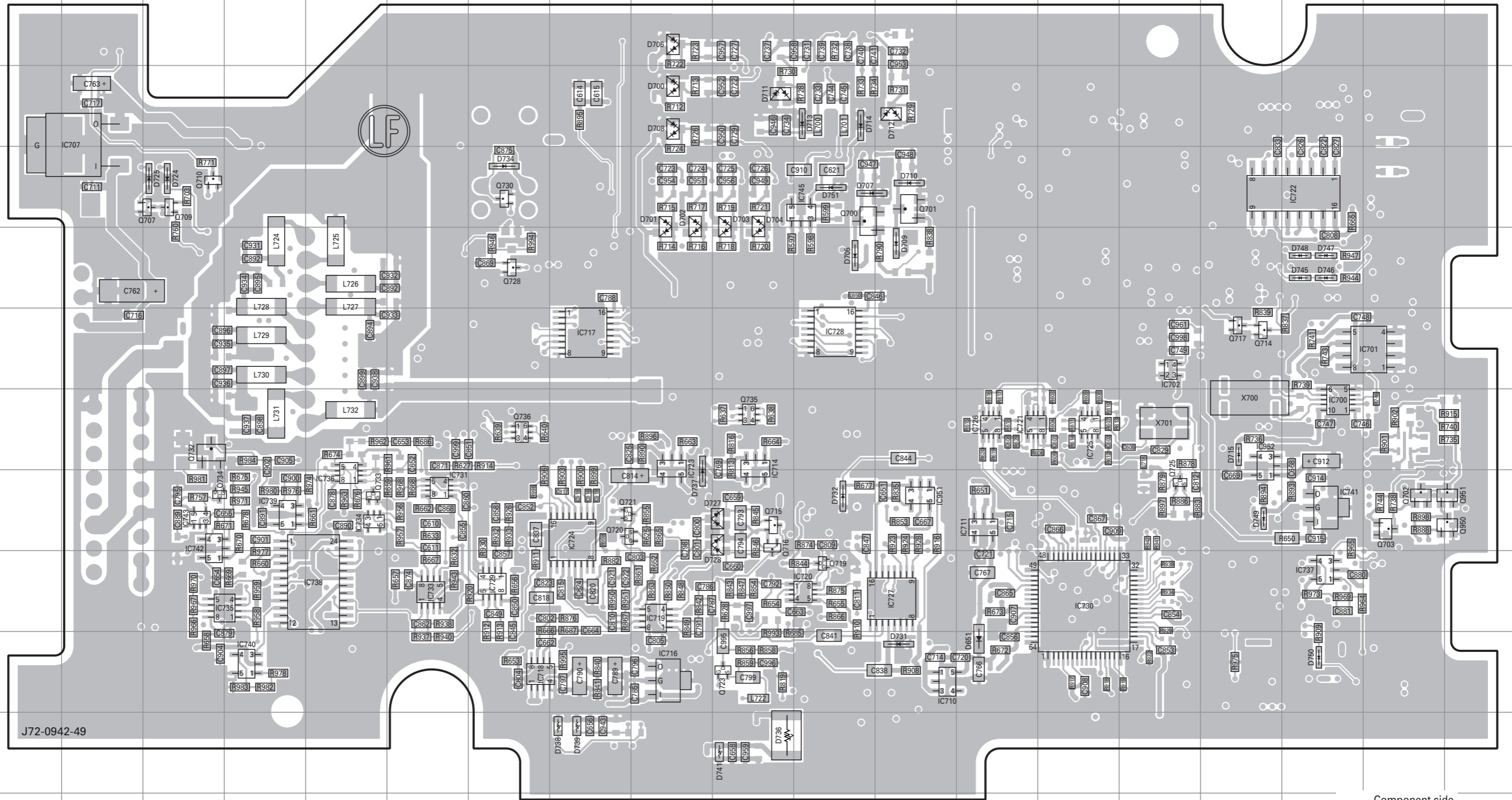


TK-5810(B) PC BOARD

CONTROL UNIT (X53-4120-10)
Foil side view (J72-0942-49)

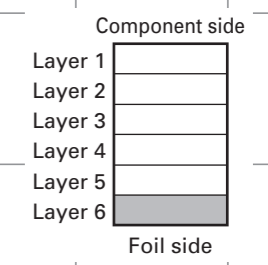
PC BOARD TK-5810(B)

CONTROL UNIT (X53-4120-10)
Foil side view (J72-0942-49)



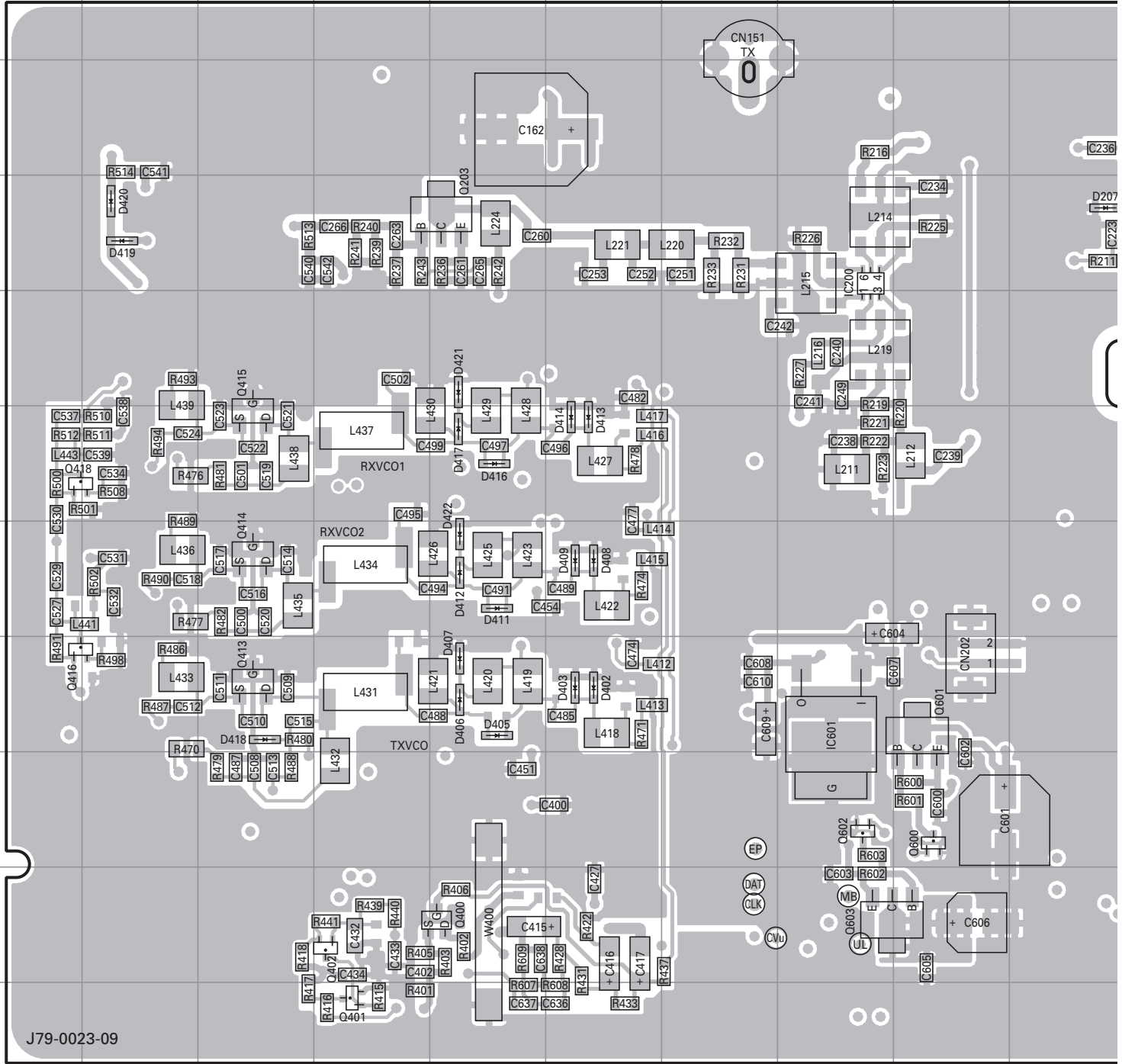
J72-0942-49

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address										
IC700	7Q	IC716	10I	IC723	7I	IC730	9N	IC738	9E	IC951	8L	Q709	4C	Q720	8H	Q733	8E	D700	3I	D707	4K	D714	4K	D732	8K	D745	5Q														
IC701	6R	IC717	6H	IC724	8H	IC731	8F	IC739	8D	IC952	7P	Q710	4C	Q721	8H	Q734	8C	D701	4I	D708	3I	D715	7P	D734	4G	D746	5Q														
IC702	6O	IC718	10G	IC725	7N	IC733	9F	IC740	10D	Q700	4K	Q714	6P	Q723	10J	Q735	7J	D702	4I	D709	5L	D724	4C	D736	11J	D747	5Q														
IC707	3B	IC719	9I	IC726	7M	IC734	8E	IC741	8Q	Q701	4L	Q715	8J	Q725	8O	Q736	7G	D703	4J	D710	4L	D725	4C	D737	8I	D748	5Q														
IC710	10L	IC720	9K	IC727	9L	IC735	9D	IC742	8C	Q702	8R	Q716	8J	Q728	5G	Q950	8S	D704	4J	D711	3J	D727	8J	D738	11H	D749	8P														
IC711	8M	IC721	7M	IC728	6K	IC736	8E	IC743	8C	Q703	8R	Q717	6P	Q730	4G	Q951	8S	D705	5K	D712	3L	D728	8J	D739	11H	D750	10Q														
IC714	7J	IC722	4Q	IC729	9G	IC737	9Q	IC745	4K	Q707	4C	Q719	9K	Q732	7C	D651	10M	D706	2I	D713	4K	D731	10L	D741	11J	D751	4K														



TK-5810(B) PC BOARD

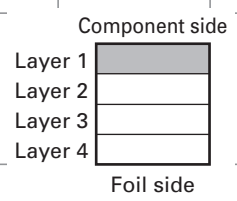
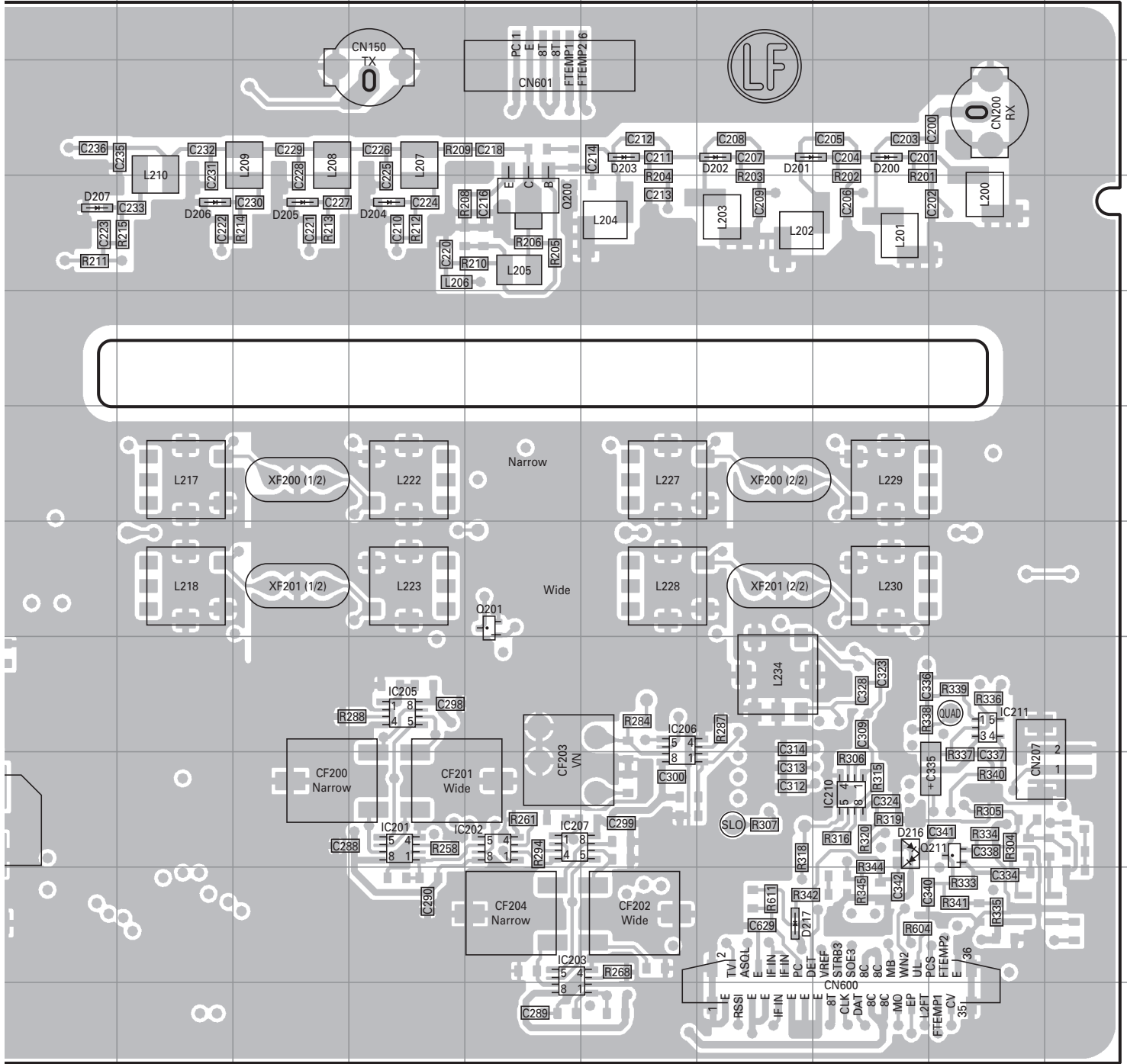
TX-RX UNIT (X57-7270-XX) -10 : K -11 : K2
 Component side view (J79-0023-09)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC200	4H	IC601	8H	Q414	7C	D201	3P	D402	8F	D413	6F
IC201	9M	Q200	4N	Q415	6C	D202	3P	D403	8F	D414	6F
IC202	9N	Q201	7N	Q416	8A	D203	3O	D405	8E	D416	6E
IC203	10N	Q203	4E	Q418	6A	D204	4M	D406	8E	D417	6E
IC205	8M	Q211	9R	Q600	9I	D205	4L	D407	8E	D418	8C
IC206	8O	Q400	10E	Q601	8I	D206	4K	D408	7F	D419	4B
IC207	9N	Q401	11D	Q602	9H	D207	4J	D409	7F	D420	4B
IC210	9Q	Q402	10D	Q603	10H	D216	9Q	D411	7E	D421	5E
IC211	8R	Q413	8C	D200	3Q	D217	10P	D412	7E	D422	7E

PC BOARD TK-5810(B)

TX-RX UNIT (X57-7270-XX) -10 : K -11 : K2
Component side view (J79-0023-09)

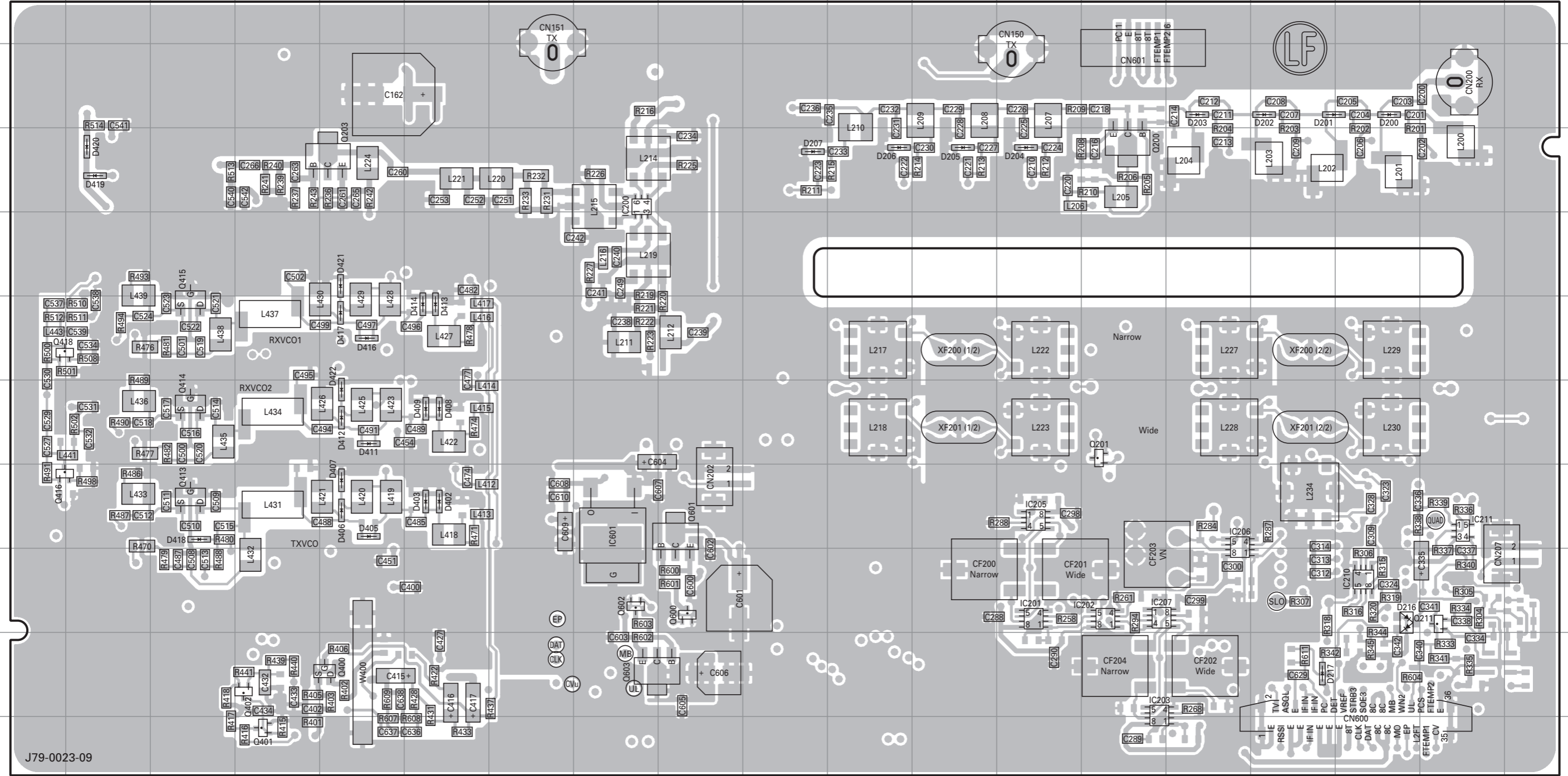


TK-5810(B) PC BOARD

TX-RX UNIT (X57-7270-XX) -10 : K -11 : K2
Component side view (J79-0023-09)

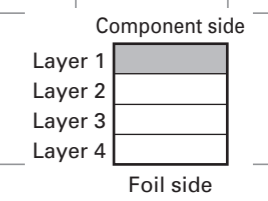
PC BOARD TK-5810(B)

TX-RX UNIT (X57-7270-XX) -10 : K -11 : K2
Component side view (J79-0023-09)



J79-0023-09

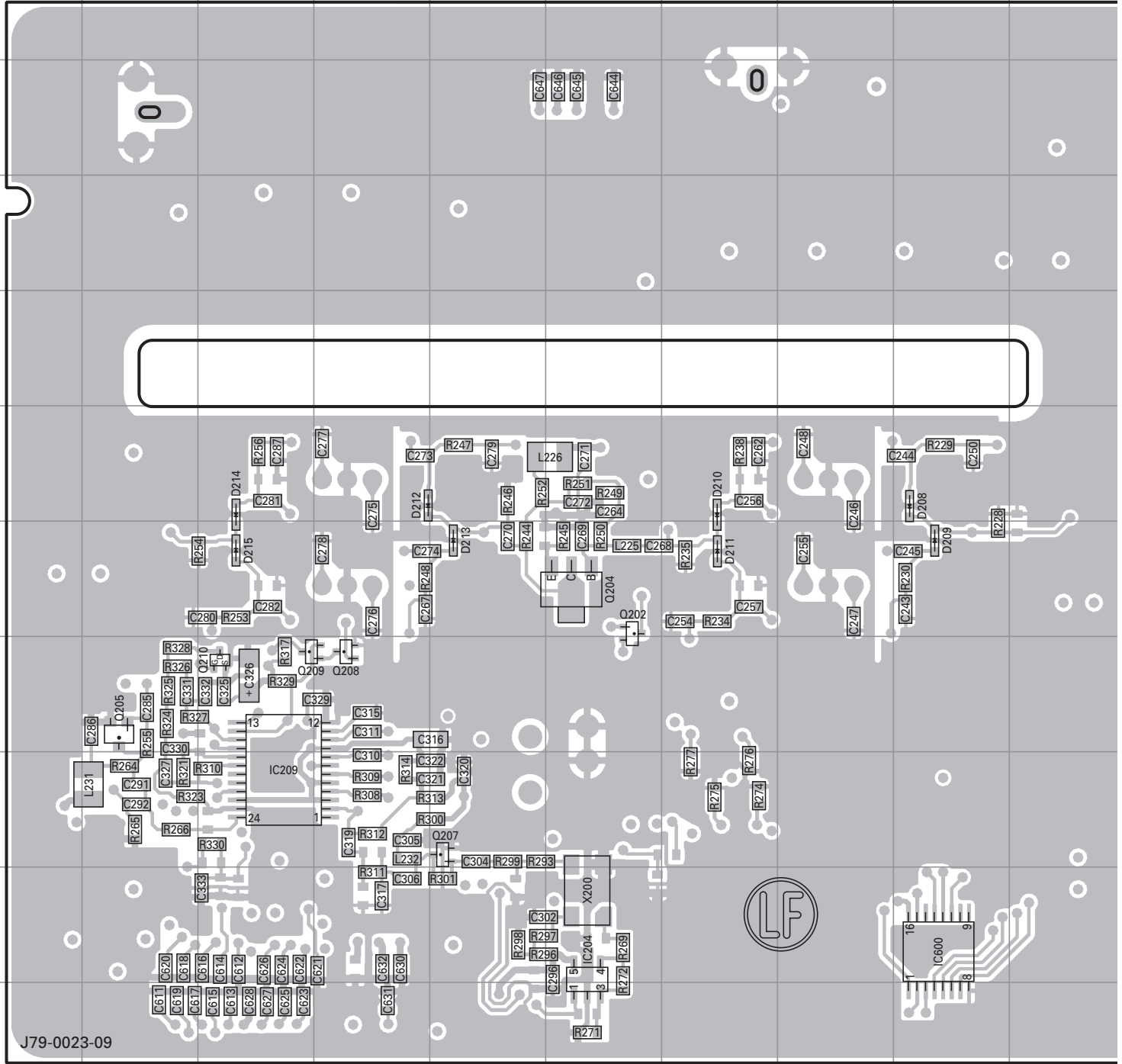
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC200	4H	IC601	8H	Q414	7C	D201	3P	D402	8F	D413	6F
IC201	9M	Q200	4N	Q415	6C	D202	3P	D403	8F	D414	6F
IC202	9N	Q201	7N	Q416	8A	D203	3O	D405	8E	D417	6E
IC203	10N	Q203	4E	Q418	6A	D204	4M	D406	8E	D418	8C
IC205	8M	Q211	9R	Q600	9I	D205	4L	D407	8E	D419	4B
IC206	8O	Q400	10E	Q601	8I	D206	4K	D408	7F	D420	4B
IC207	9N	Q401	11D	Q602	9H	D207	4J	D409	7F	D421	5E
IC210	9Q	Q402	10D	Q603	10H	D216	9Q	D411	7E	D422	7E
IC211	8R	Q413	8C	D200	3Q	D217	10P	D412	7E		



TK-5810(B) PC BOARD

TX-RX UNIT (X57-7270-XX) -10 : K -11 : K2

Foil side view (J79-0023-09)

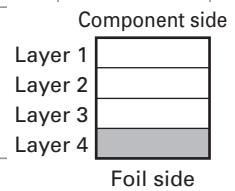
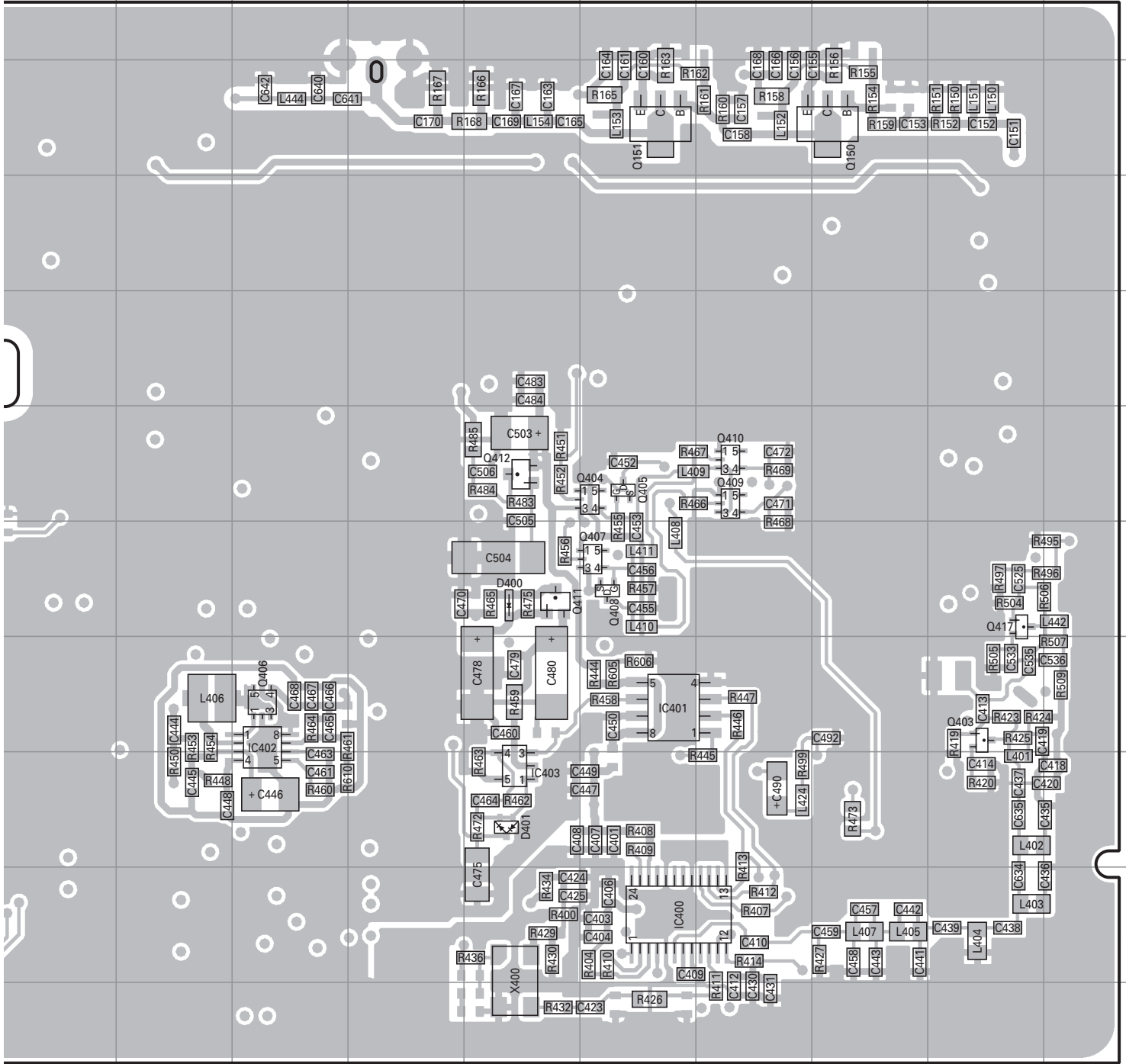


J79-0023-09

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC204	10F	Q150	3Q	Q209	8C	Q408	7O	D209	7I	D400	7N
IC209	9C	Q151	3O	Q210	8C	Q409	6P	D210	6G	D401	9N
IC400	10O	Q202	7F	Q403	8R	Q410	6P	D211	7G		
IC401	8O	Q204	7F	Q404	6O	Q411	7N	D212	6D		
IC402	8L	Q205	8B	Q405	6O	Q412	6N	D213	7E		
IC403	9N	Q207	9E	Q406	8L	Q417	7R	D214	6C		
IC600	10I	Q208	8D	Q407	7O	D208	6I	D215	7C		

PC BOARD TK-5810(B)

TX-RX UNIT (X57-7270-XX) -10 : K -11 : K2
Foil side view (J79-0023-09)

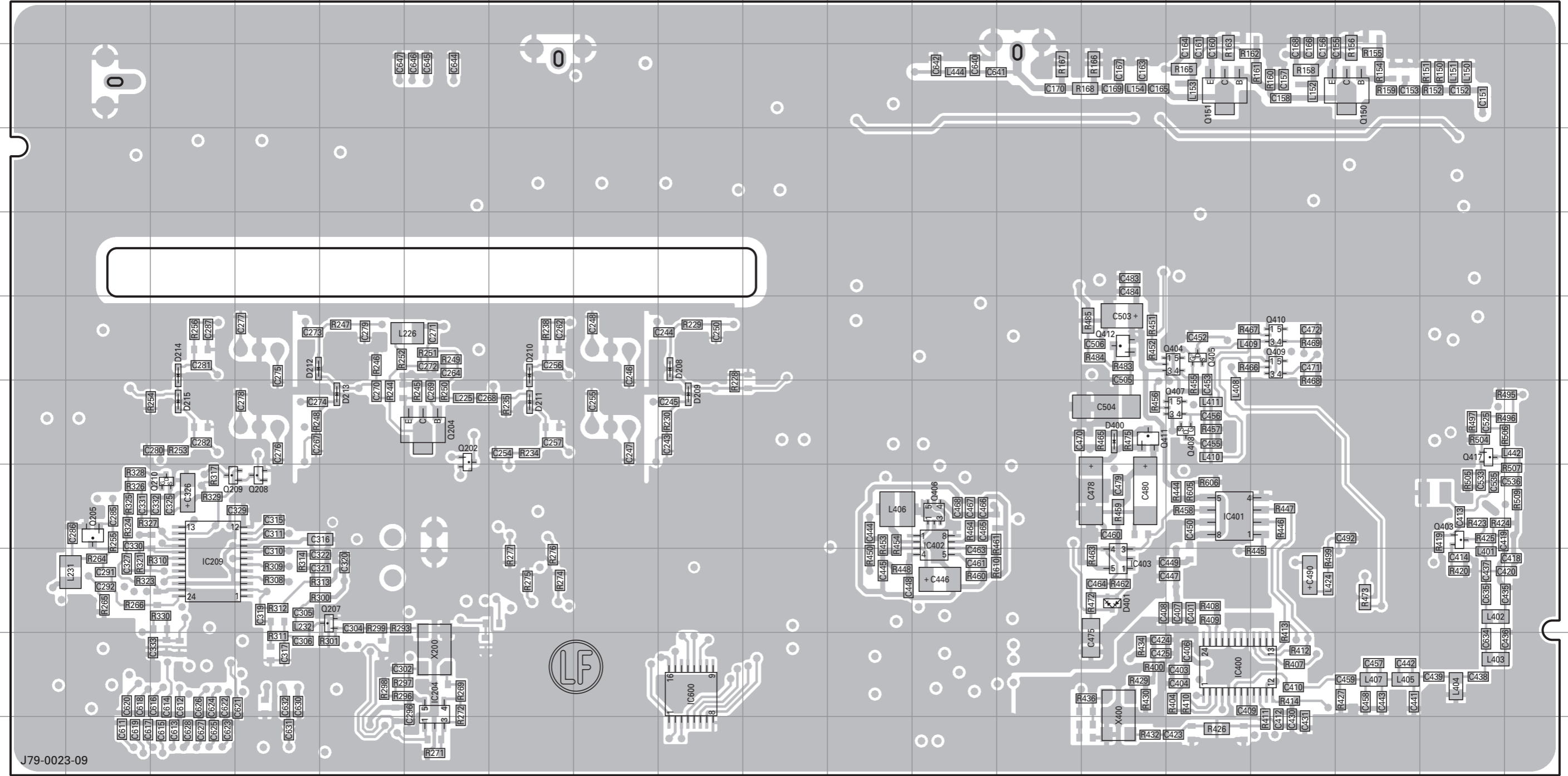


TK-5810(B) PC BOARD

TX-RX UNIT (X57-7270-XX) -10 : K -11 : K2
Foil side view (J79-0023-09)

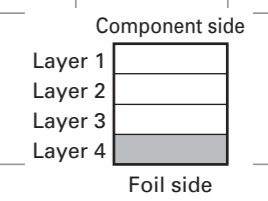
PC BOARD TK-5810(B)

TX-RX UNIT (X57-7270-XX) -10 : K -11 : K2
Foil side view (J79-0023-09)



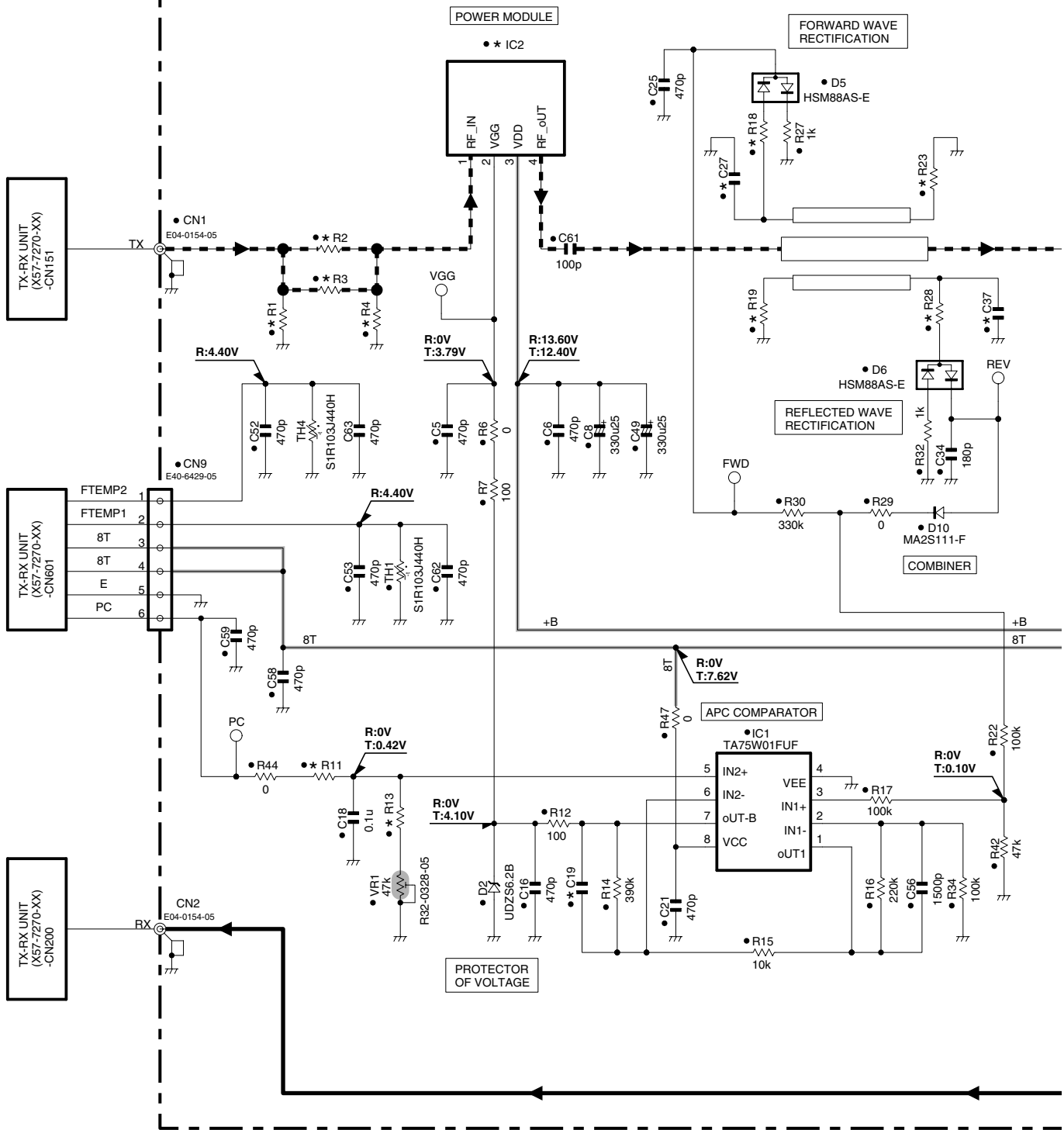
J79-0023-09

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC204	10F	Q150	3Q	Q209	8C	Q408	7O	D209	7I	D400	7N
IC209	9C	Q151	3O	Q210	8C	Q409	6P	D210	6G	D401	9N
IC400	10O	Q202	7F	Q403	8R	Q410	6P	D211	7G		
IC401	8O	Q204	7F	Q404	6O	Q411	7N	D212	6D		
IC402	8L	Q205	8B	Q405	6O	Q412	6N	D213	7E		
IC403	9N	Q207	9E	Q406	8L	Q417	7R	D214	6C		
IC600	10I	Q208	8D	Q407	7O	D208	6I	D215	7C		



TK-5810(B) SCHEMATIC DIAGRAM

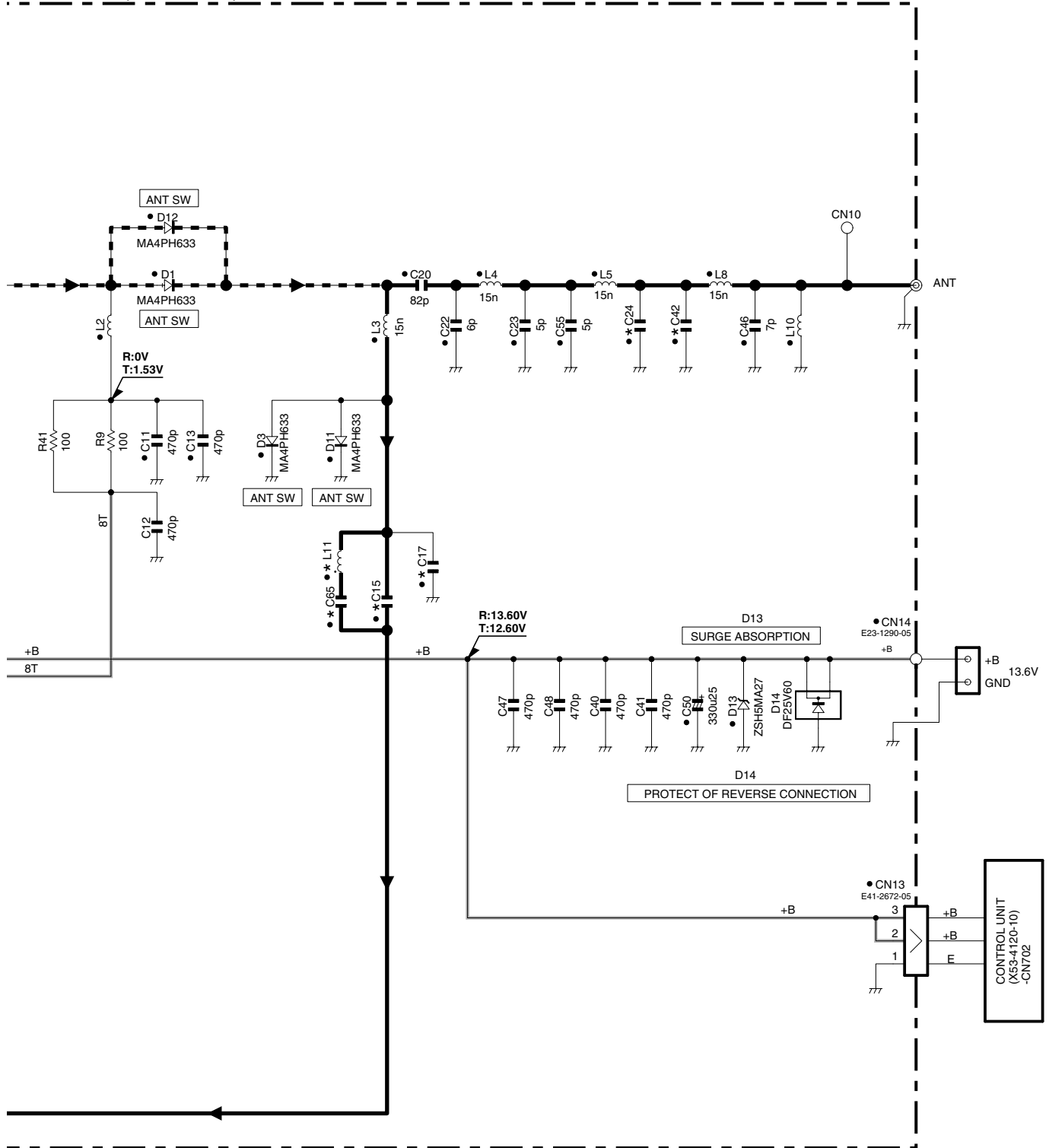
FINAL UNIT (X45-3790-XX)



X45-3790-XX	IC2	R1	R2	R3	R4	R11	R13	R18	R19	R23	R28	C19	C27	C37
-10	K	RA60H44521101	820	10	10	820	47k	15k	82	56	68	330	0.068u	5p
-11	K2	RA60H40471101	470	18	18	470	220k	18k	180	33	56	1k	0.015u	22p

SCHEMATIC DIAGRAM TK-5810(B)

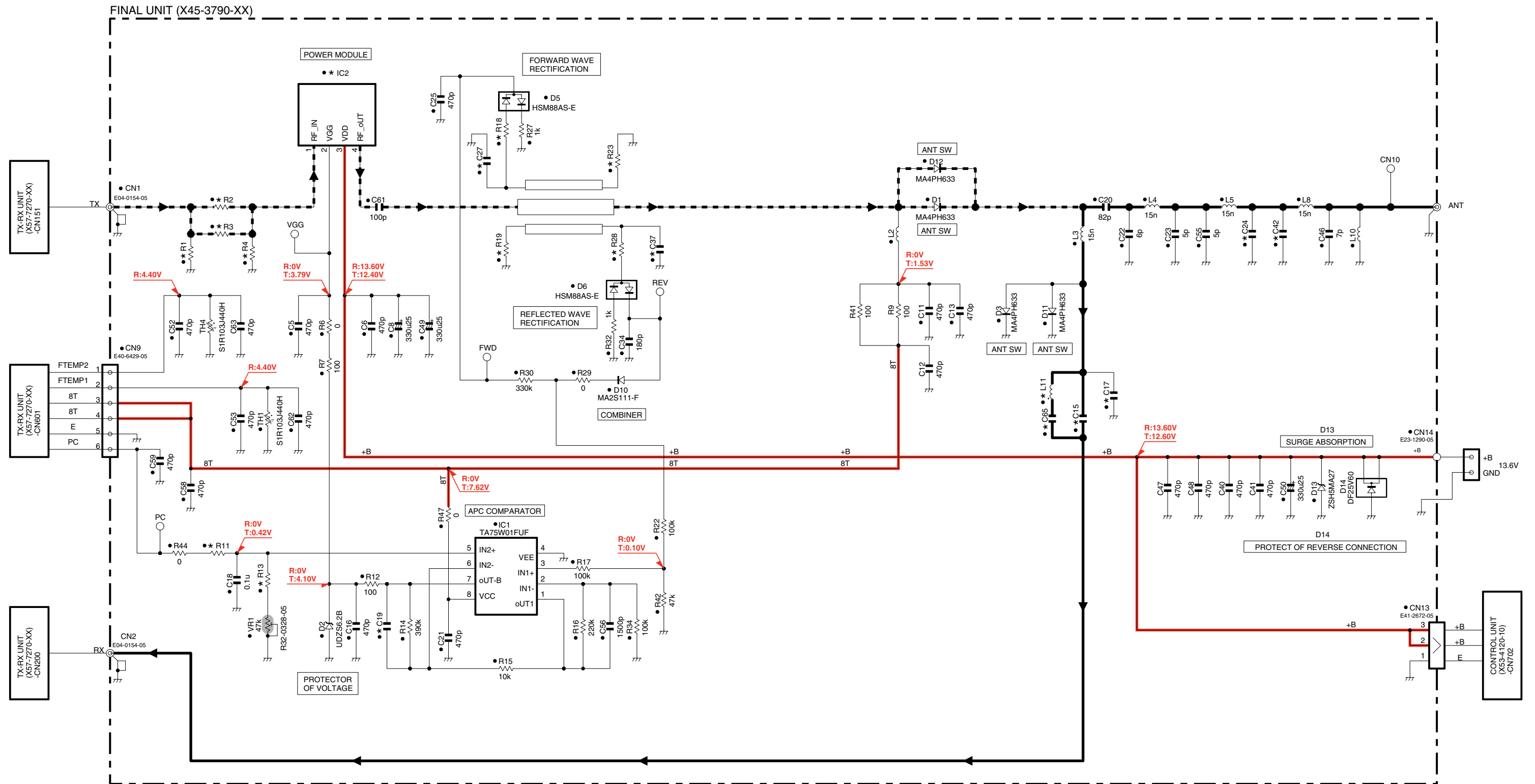
FINAL UNIT (X45-3790-XX)



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

X45-3790-XX	L11	C15	C17	C24	C42	C65
-10	K	15n	NO	5p	6p	470p
-11	K2	NO	470p	3p	7p	NO

TK-5810(B) SCHEMATIC DIAGRAM

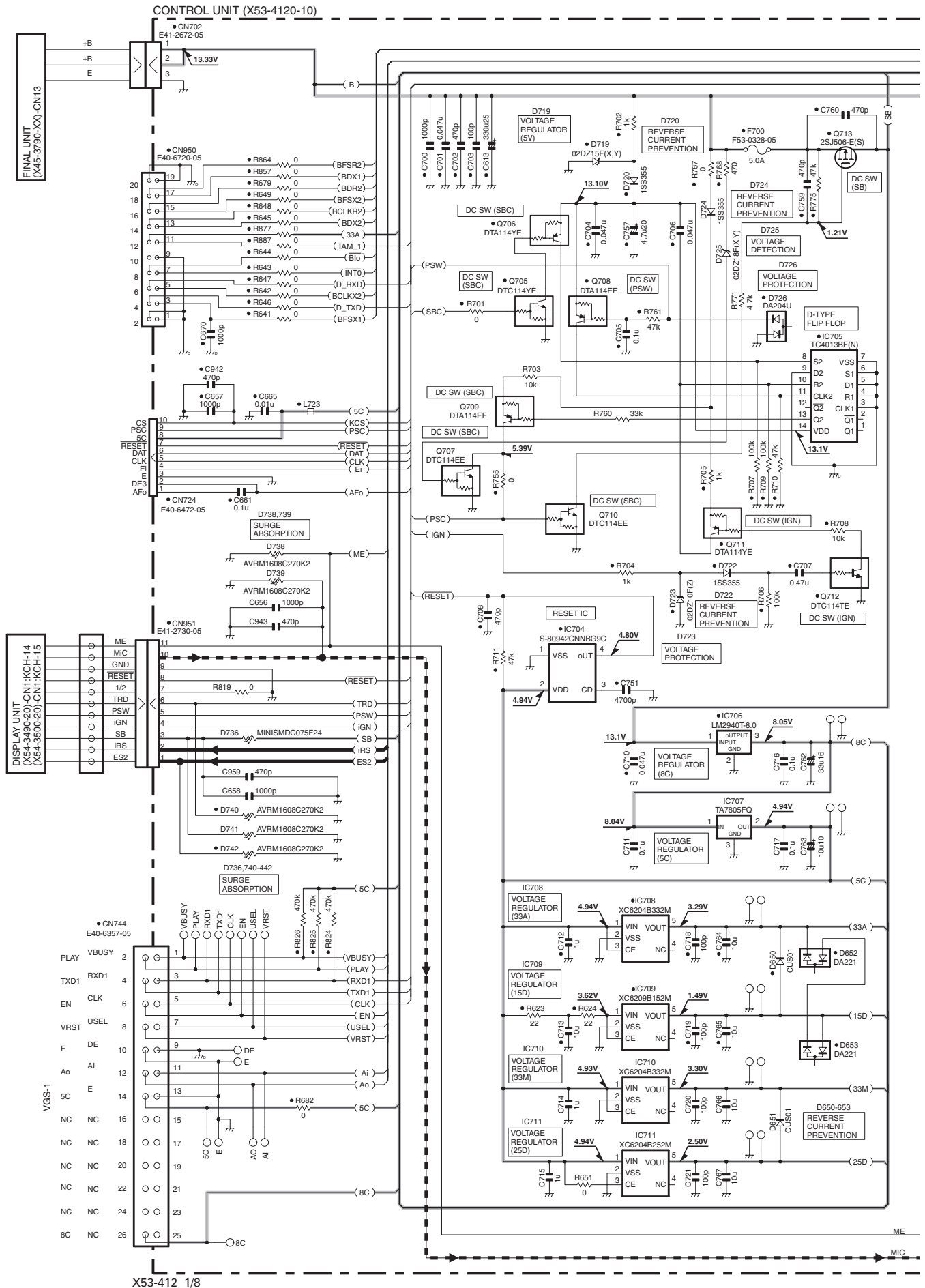


Note : The components marked with a dot (●) are parts of layer 1.

X45-3790-XX	IC2	R1	R2	R3	R4	R11	R13	R18	R19	R23	R28	C19	C27	C37
-10	K	RA60H44521101	820	10	10	820	47k	15k	82	56	68	330	0.068u	5p
-11	K2	RA60H40471101	470	18	18	470	220k	18k	180	33	56	1k	0.015u	22p

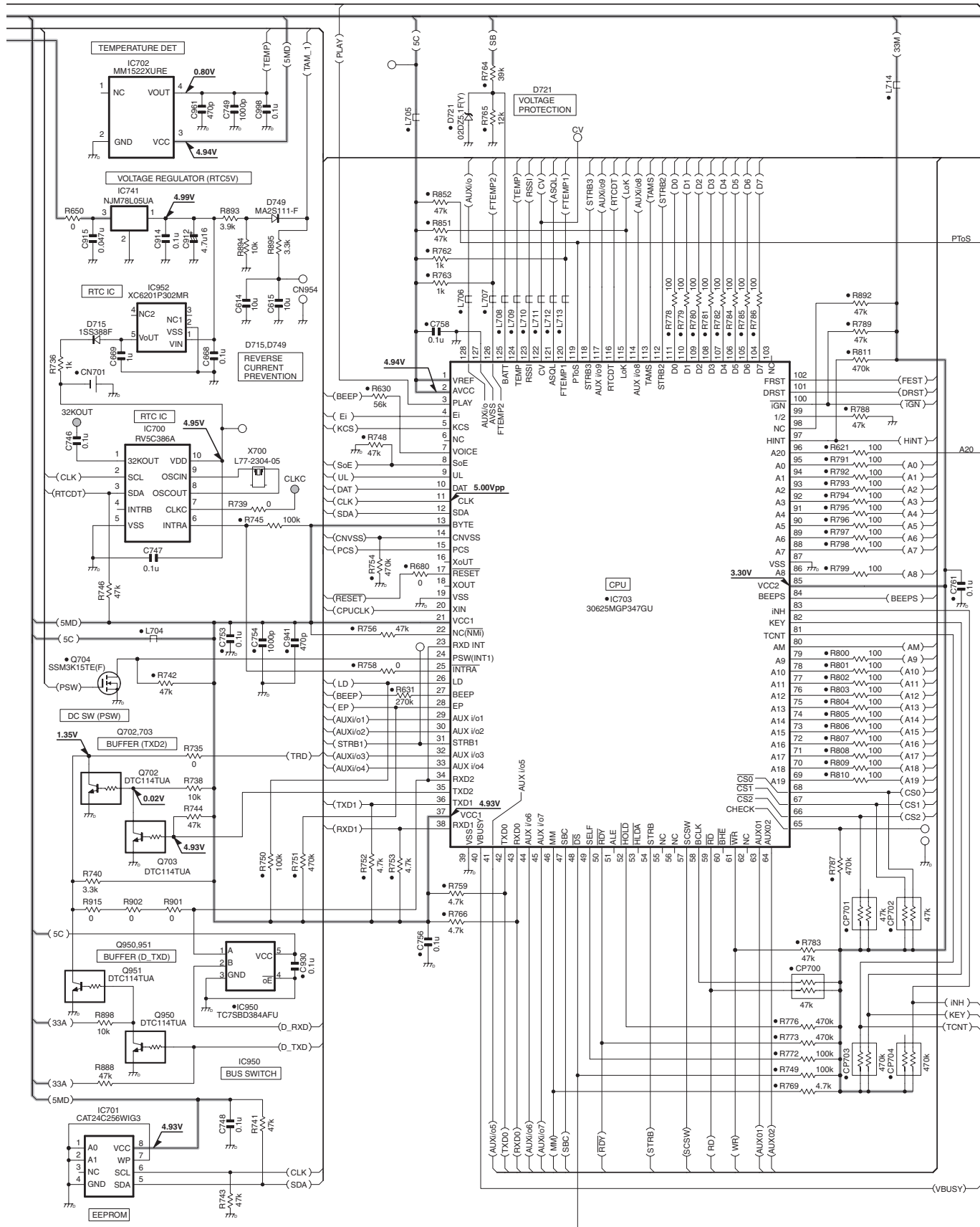
X45-3790-XX	L11	C15	C17	C24	C42	C65
-10	K	15n	NO	5p	6p	470p
-11	K2	NO	470p	3p	7p	NO

TK-5810(B) SCHEMATIC DIAGRAM



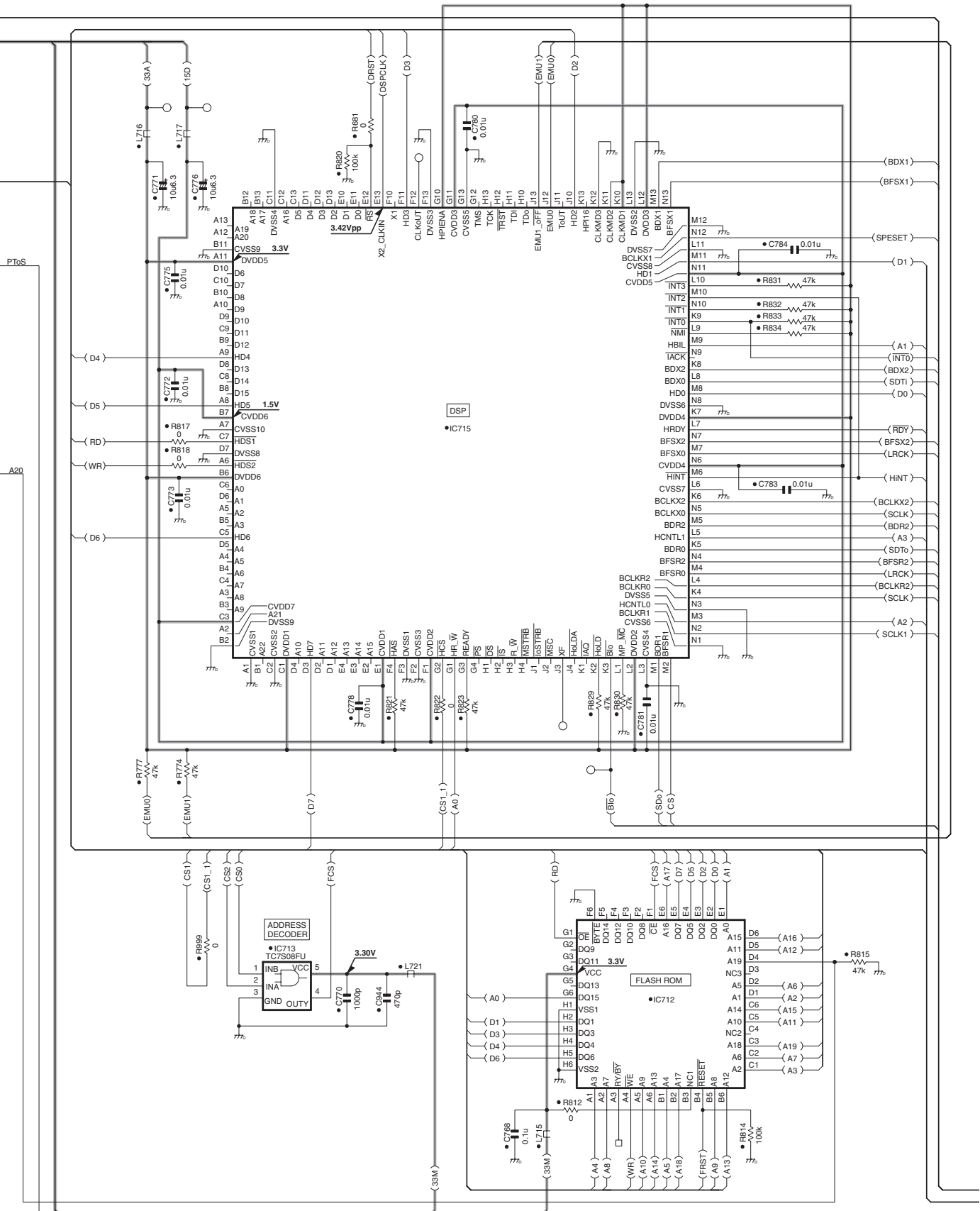
SCHEMATIC DIAGRAM TK-5810(B)

CONTROL UNIT(X53-4120-10)



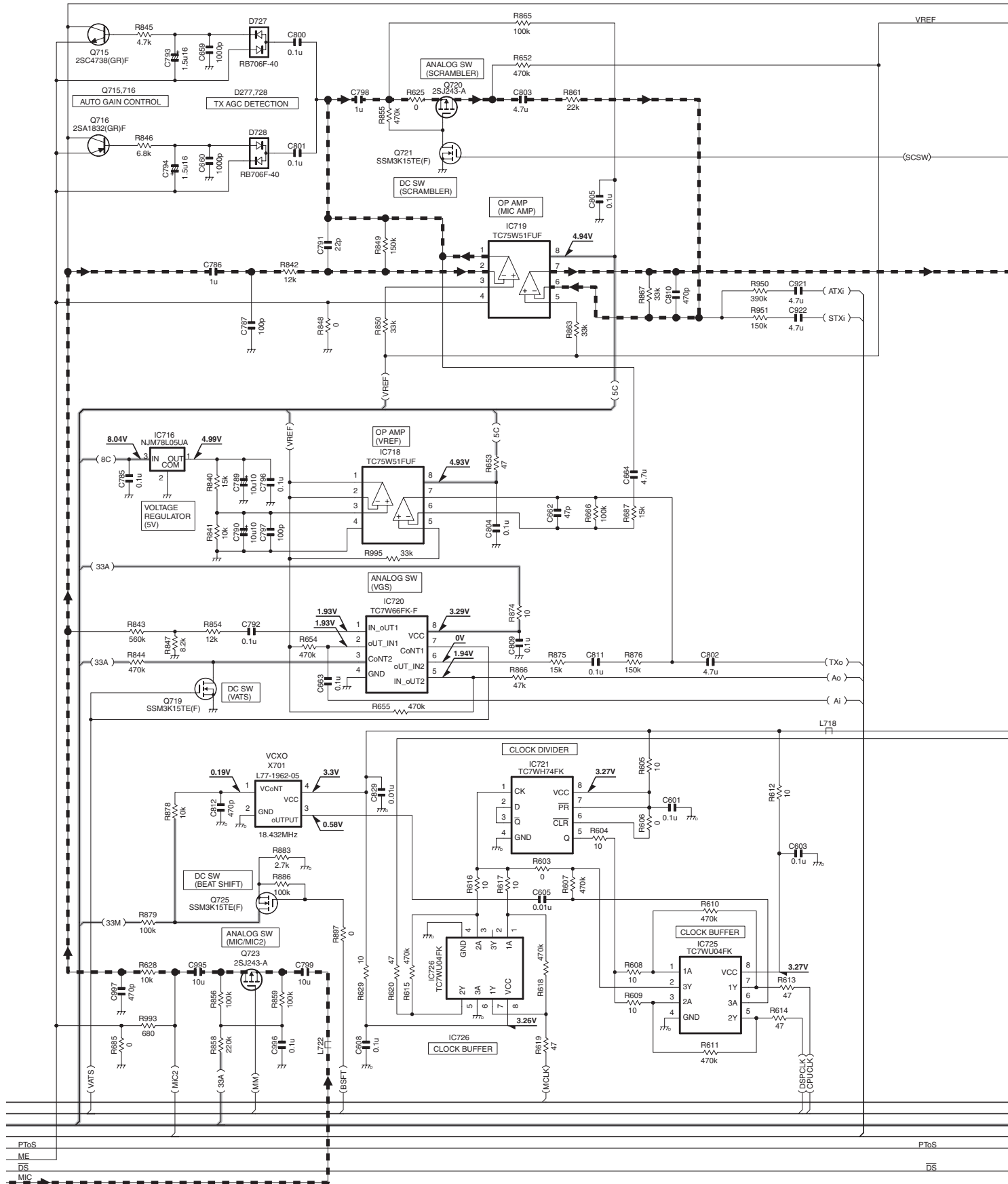
TK-5810(B) SCHEMATIC DIAGRAM

CONTROL UNIT(X53-4120-10)



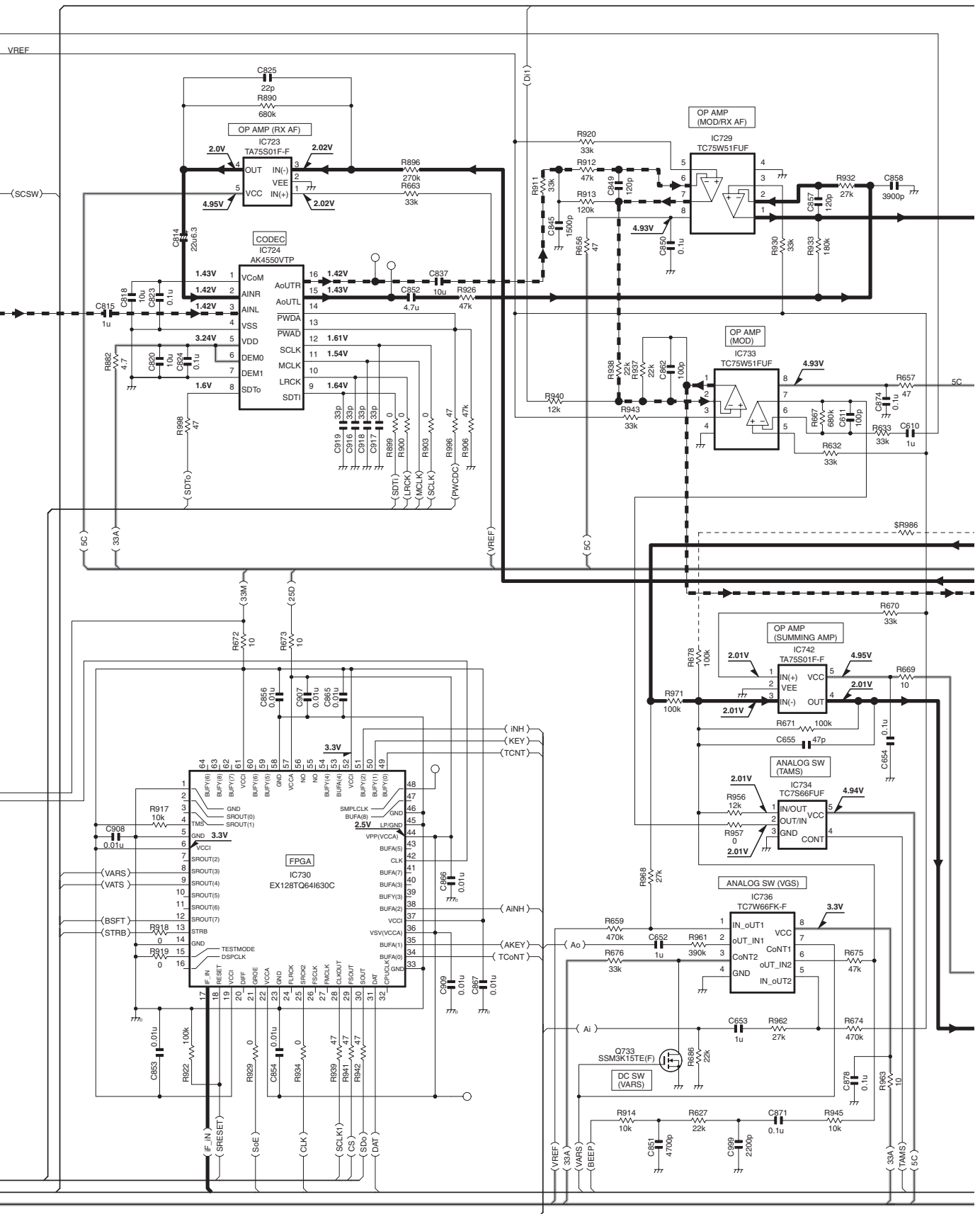
SCHEMATIC DIAGRAM TK-5810(B)

CONTROL UNIT(X53-4120-10)



TK-5810(B) SCHEMATIC DIAGRAM

CONTROL UNIT(X53-4120-10)



PToS

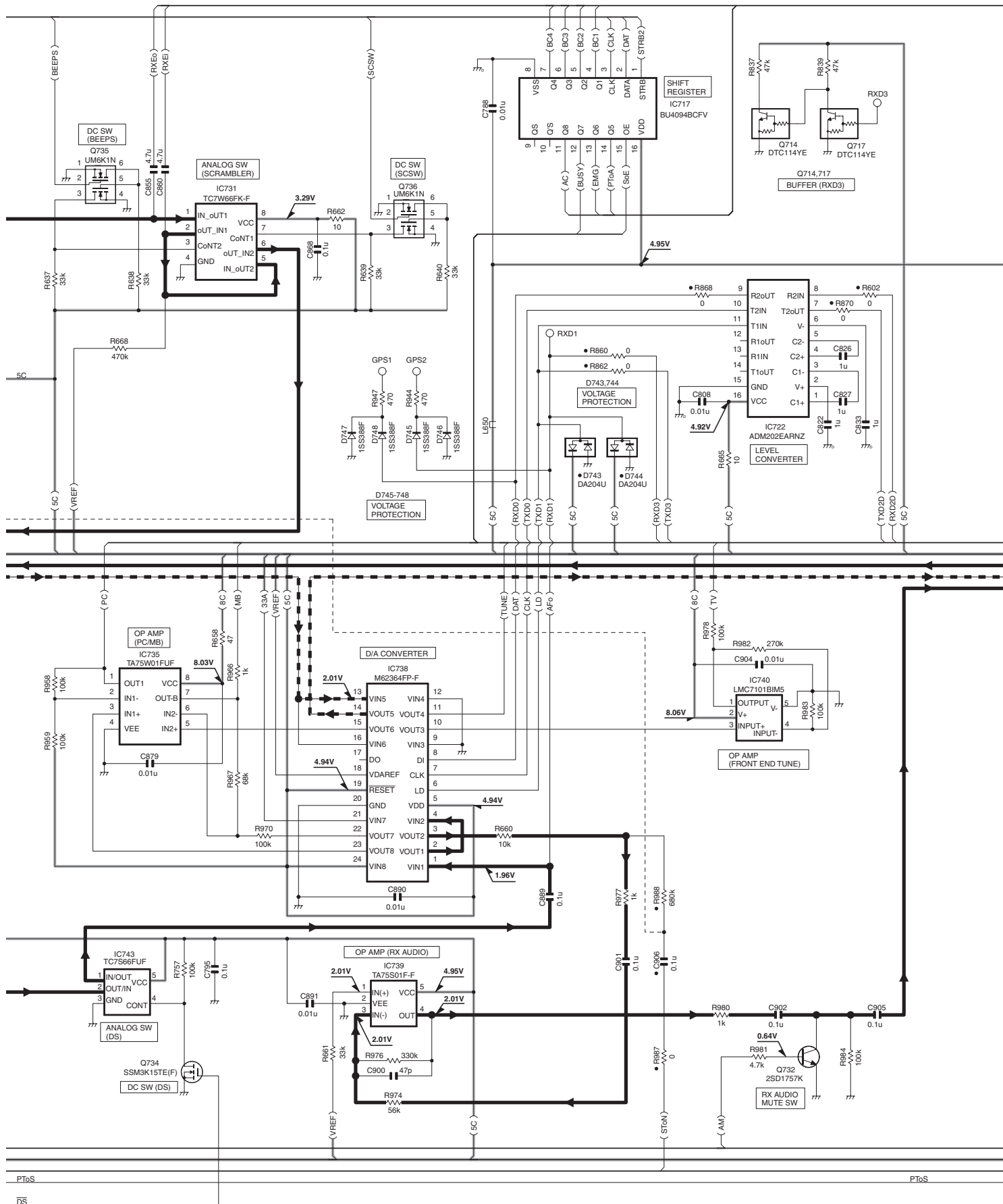
PToS

DS

DS

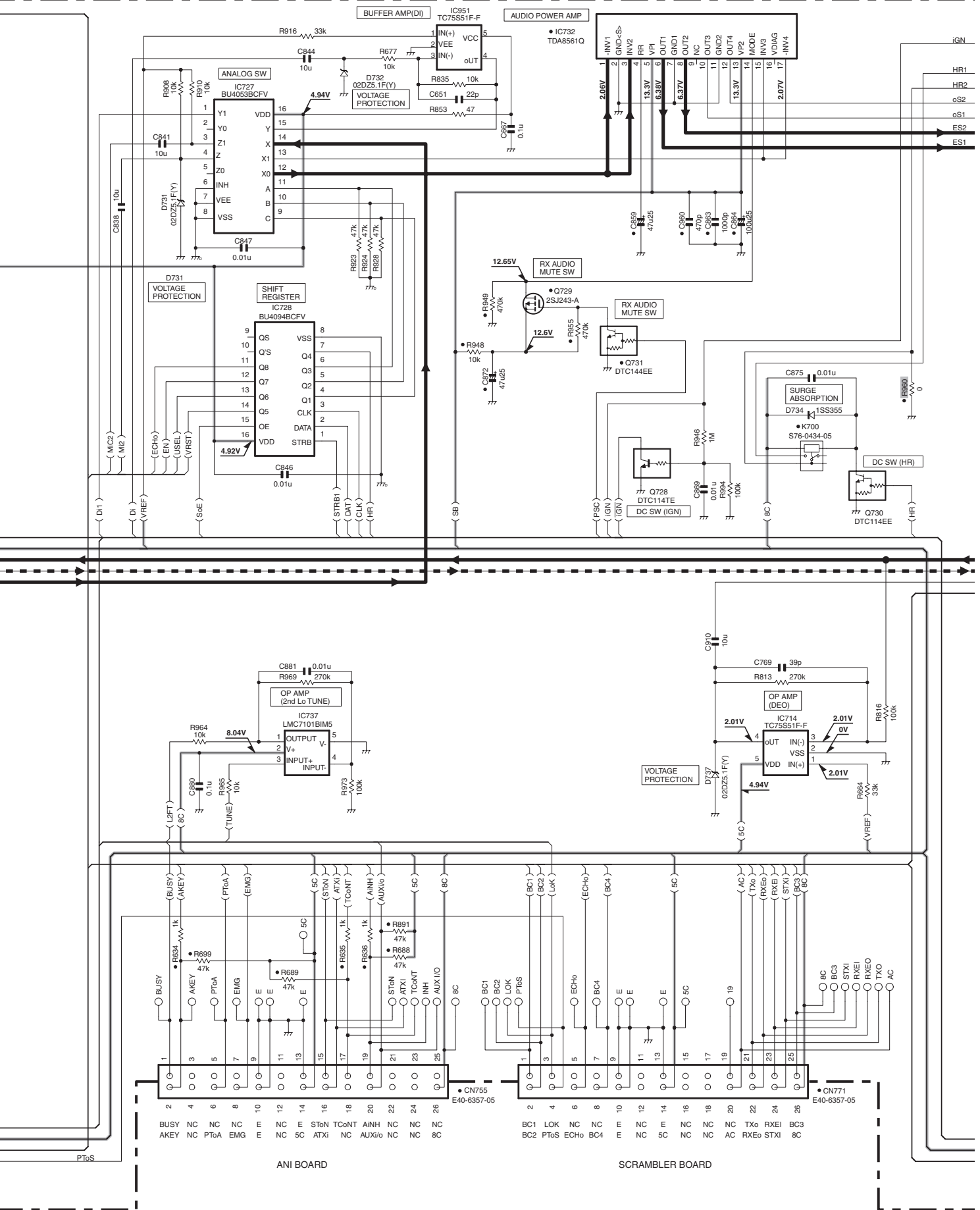
SCHEMATIC DIAGRAM TK-5810(B)

CONTROL UNIT(X53-4120-10)



TK-5810(B) SCHEMATIC DIAGRAM

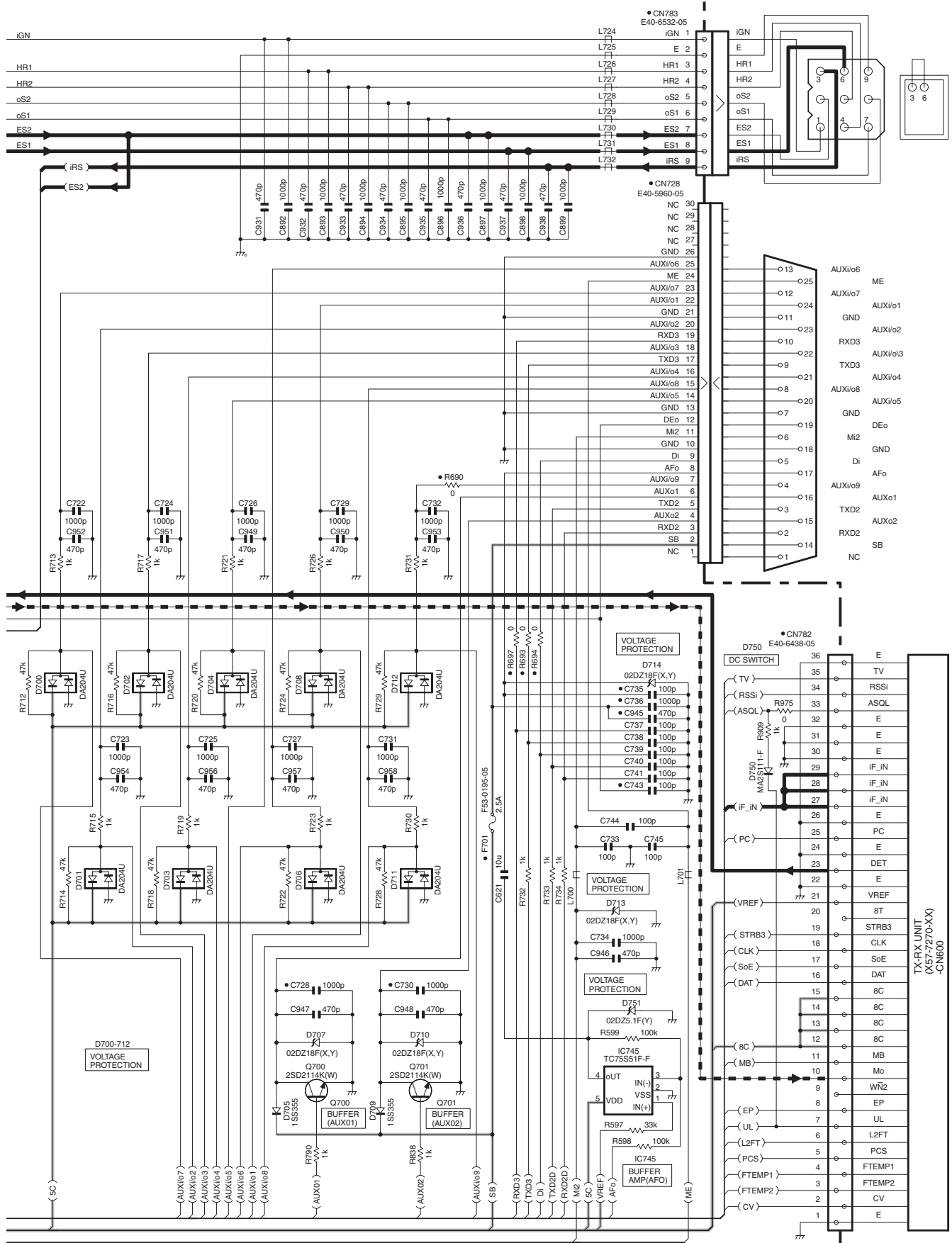
CONTROL UNIT(X53-4120-10)



SCHEMATIC DIAGRAM TK-5810(B)

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

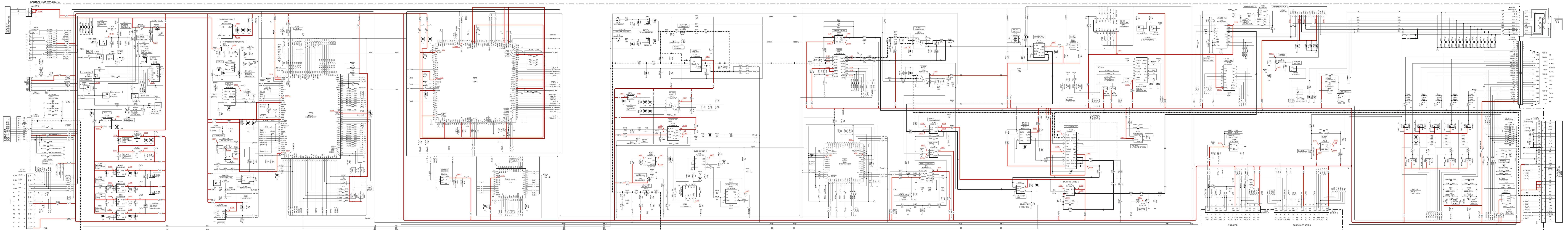
CONTROL UNIT(X53-4120-10)



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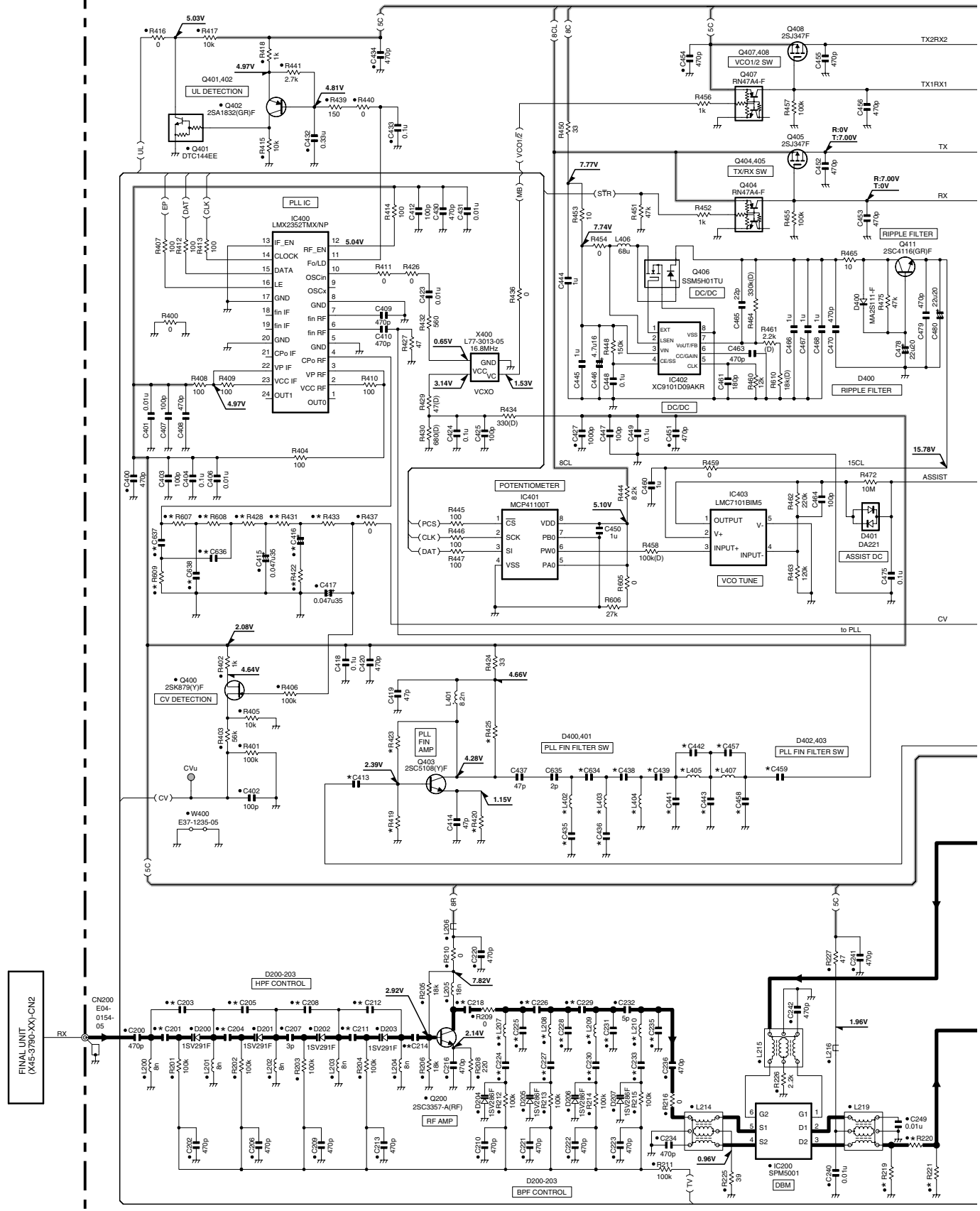
TK-5810(B) SCHEMATIC DIAGRAM

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



TK-5810(B) SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7270-XX)

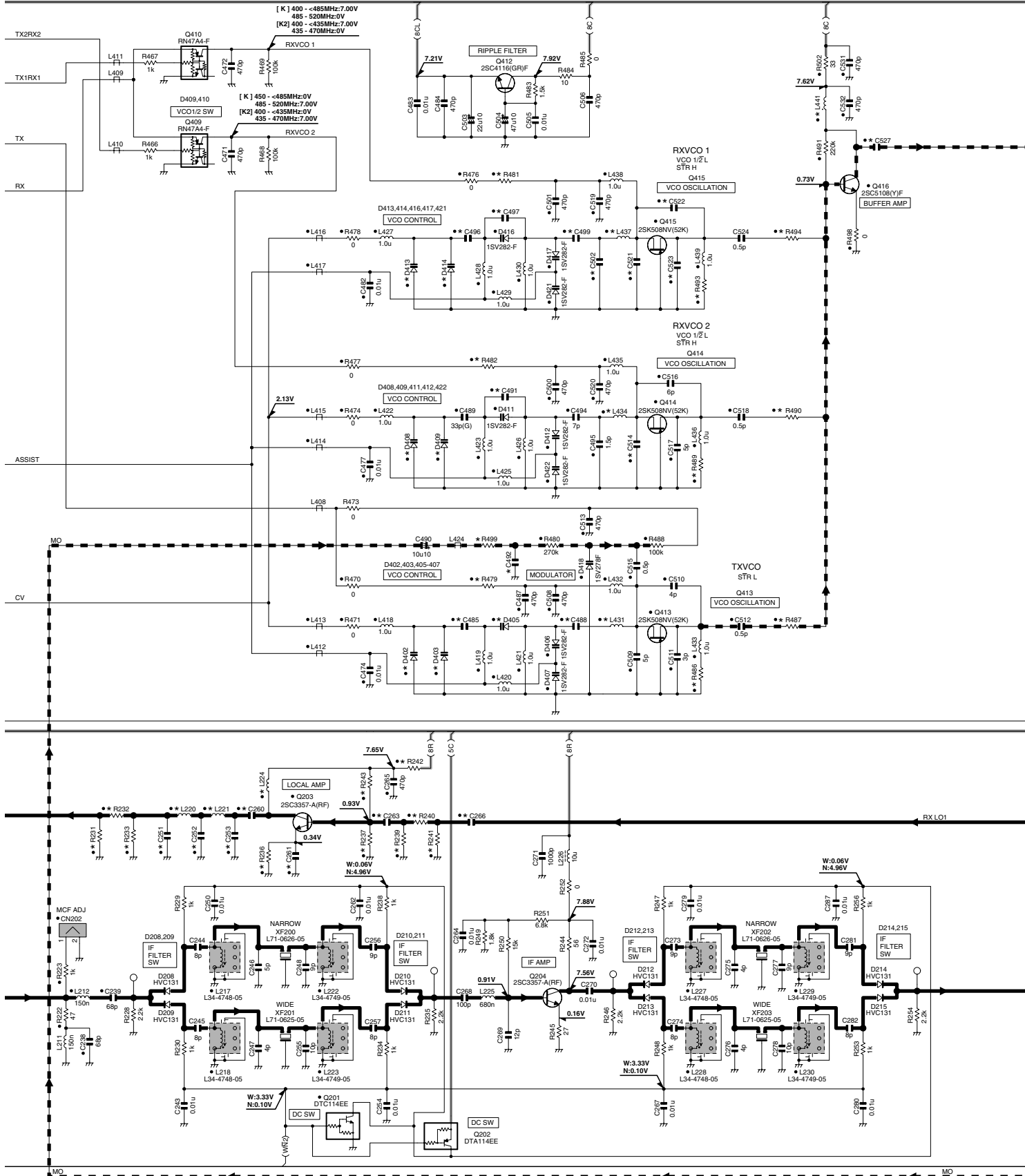


X57-7270-XX	L207	L208	L209	L210	L402	L403	L404	L405	L407	R219	R220	R221	R419	R420	R422	R423	R425	R428	R431	R433	R607	R608	R609	C201	C203	
-10	K	L34-4566-05(ST)	L34-4566-05(ST)	L34-4566-05(ST)	NO	4.7n	4.7n	3.3n	3.3n	NO	0	NO	4.7k(D)	15k(D)	1.2k	4.7k	220	100	0	100	390	390	180	3p	1.5p	
-11	K2	L34-4566-05(BT)	L34-4566-05(BT)	L34-4566-05(BT)	15n	15n	NO	6.8n	6.8n	820	5.6	820	10k(D)	100(D)	3.9k	10k	NO	1k	1k	2.2k	0	0	0	NO	4p	2p

X57-7270-XX	C204	C205	C208	C211	C212	C214	C218	C224	C225	C226	C227	C228	C229	C230	C231	C233	C413	C416	C435	C436	C438	C439	C441	C442	C443	C457	C458	C459	C634	C636	C637	C638
-10	K	3p	0.5p	0.5p	1p	1.5p	10p	22p	9p	3p	18p	7p	4p	18p	22p	8p	47p	1u	NO	27p	2.5p	2.5p	2p	3p	5p	3.5p	1p	100p	47p	0.039u	0.039u	0.068u
-11	K2	4p	1p	1p	4p	2p	12p	18p	10p	5p	15p	9p	6p	15p	9p	27p	100p	0.47u	8p	6p	5p	47p	1.5p	2p	3p	2p	1.5p	47p	1.5p	NO	NO	NO

SCHEMATIC DIAGRAM TK-5810(B)

TX-RX UNIT(X57-7270-XX)

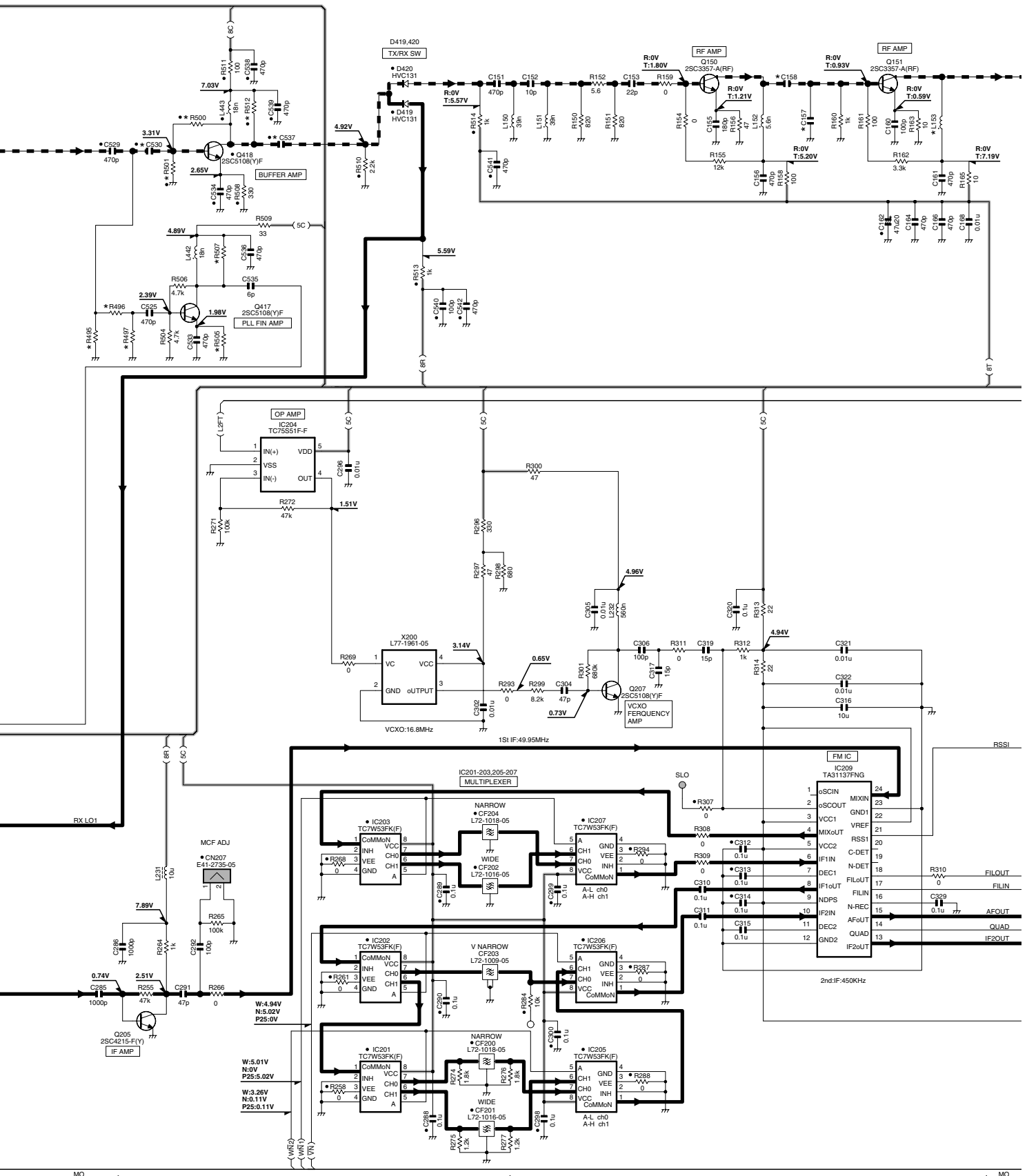


X57-7270-XX	D402	D405	D405	D408	D409	D413	D414	L220	L221	L224	L431	L434	L437	L441	R231	R232	R233	R236	R237	R239	R240	R241	R242	R243	
-10	K	1SV305F	HVC376B	B8864	1SV305F	HVC376B	1SV282-F	NO	22n	22n	33n	L34-4607-05 17.5n	L34-4608-05 22n	L34-4609-05 22n	18n	180	33	180	220	10k	180	33	180	330	18k
-11	K2	1SV282-F	NO	1SV282-F	NO	1SV282-F	NO	22n	22n	33n	L34-4608-05 22n	L34-4609-05 28n	L34-4609-05 28n	27n	270	18	270	68	560	270	18	270	33	3.9k	

X57-7270-XX	R479	R481	R482	R486	R487	R489	R490	R493	R494	R499	C251	C252	C253	C260	C261	C263	C266	C485	C488	C491	C492	C496	C497	C499	C502	C514	C521	C522	C523	C527
-10	K	390	390(D)	470(D)	150	100	220	100(D)	220(D)	100(D)	27k	5p	10p	5p	47p	12p	47p	100p	12p	1p	470p	100p	1.5p	10p	2p	6p	7p	6p	6p	6p
-11	K2	470	560(D)	270(D)	180	0	270	0	330(D)	0	22k	8p	12p	8p	4p	NO	100p	100p	27p	15p	0.5p	680p	39p	0.5p	9p	2.5p	7p	9p	7p	5p

TK-5810(B) SCHEMATIC DIAGRAM

TX-RX UNIT(X57-7270-XX)

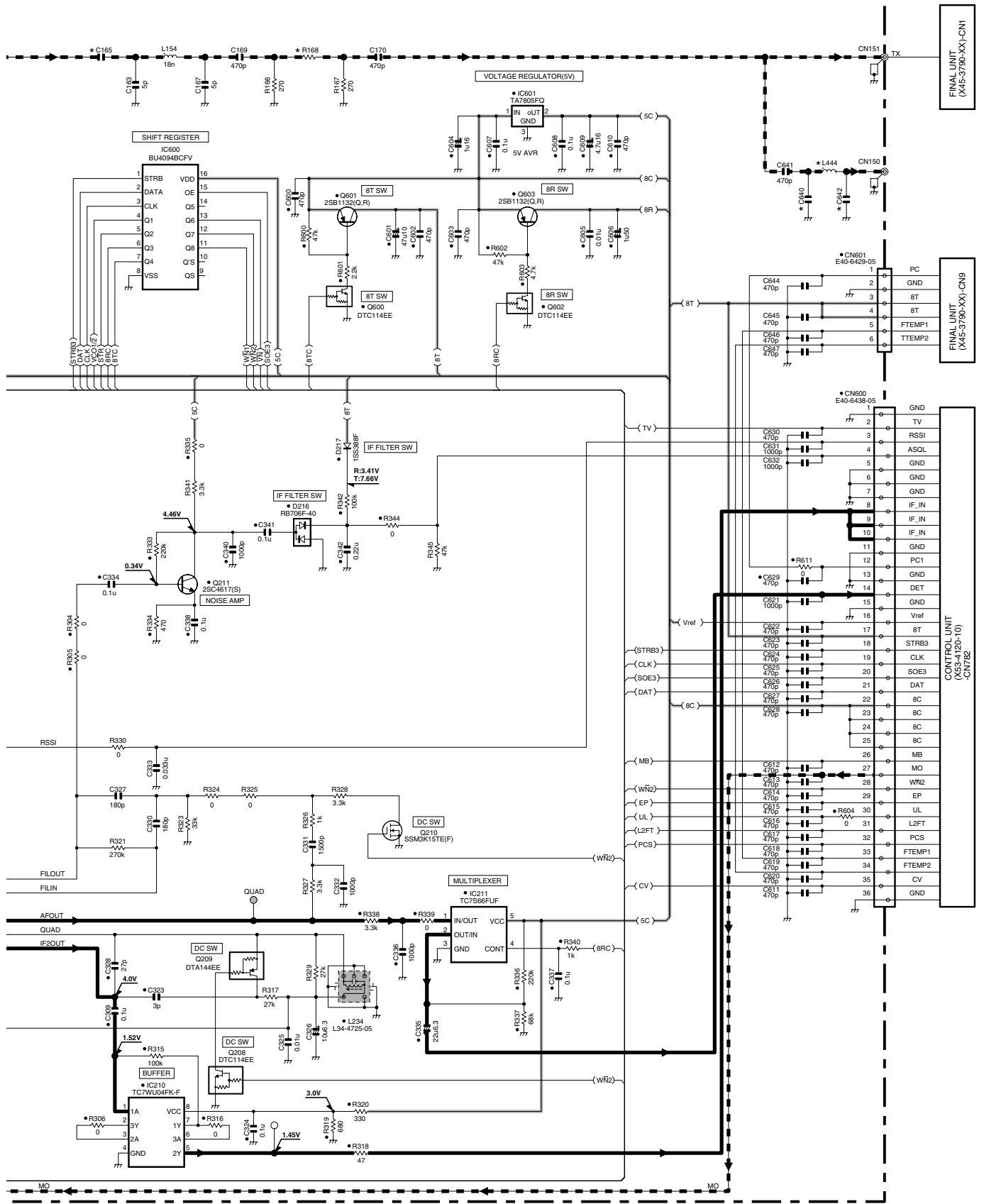


X57-7270-XX	L153	R495	R496	R497	R500	R501	R505	R507	R512	C157	C158	C530	C537	
-10	K	18n	470	12	470	22k	15k	150	150	220	1p	12p	4p	5p
-11	K2	22n	NO	0	NO	10k	10k	470	100	NO	8p	18p	5p	6p

SCHEMATIC DIAGRAM TK-5810(B)

TX-RX UNIT(X57-7270-XX)

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

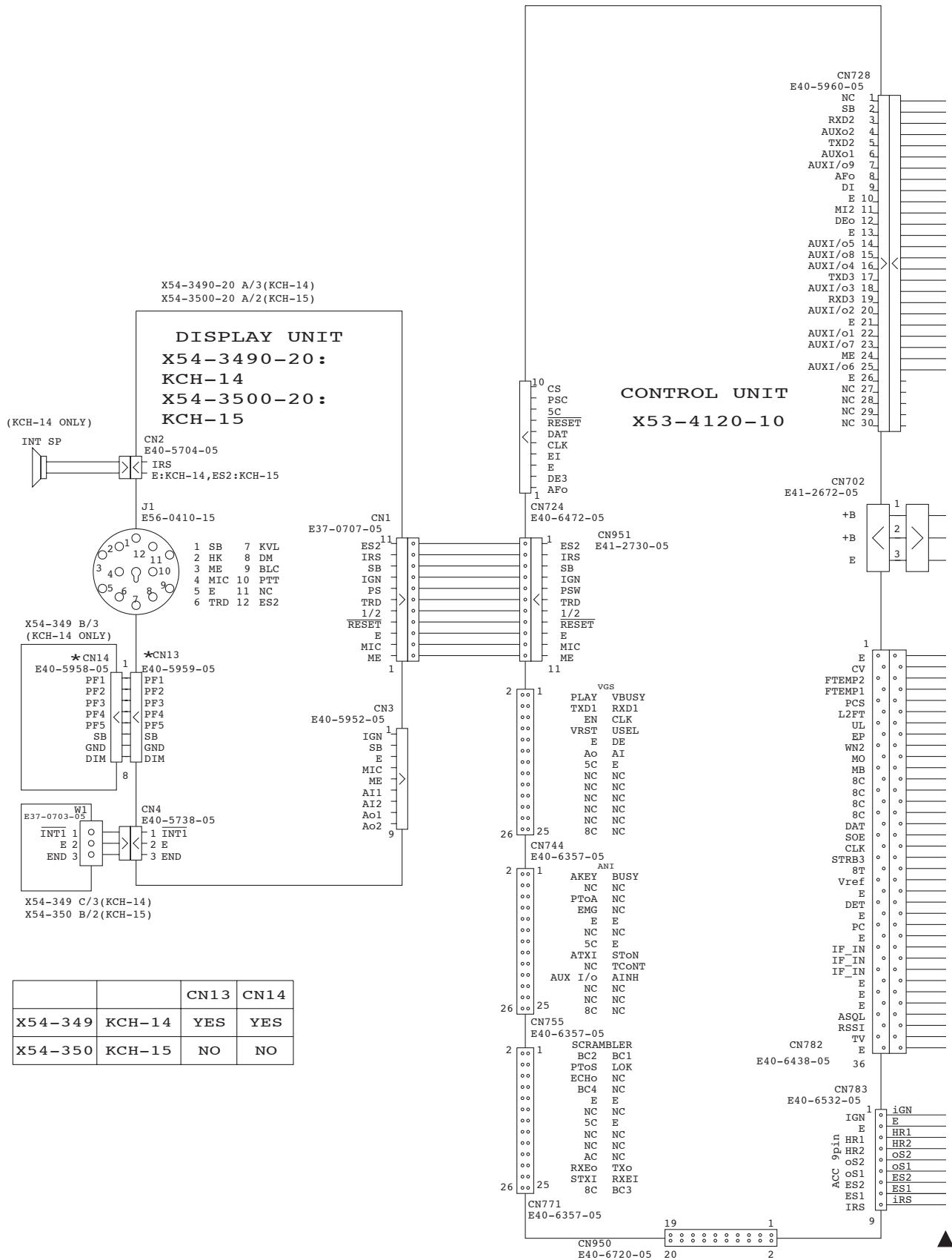


X57-7270-XX	L444	R168	C165	C640	C642
-10	K	18n	22	5p	5p
-11	K2	15n	18	7p	12p

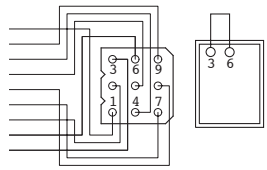
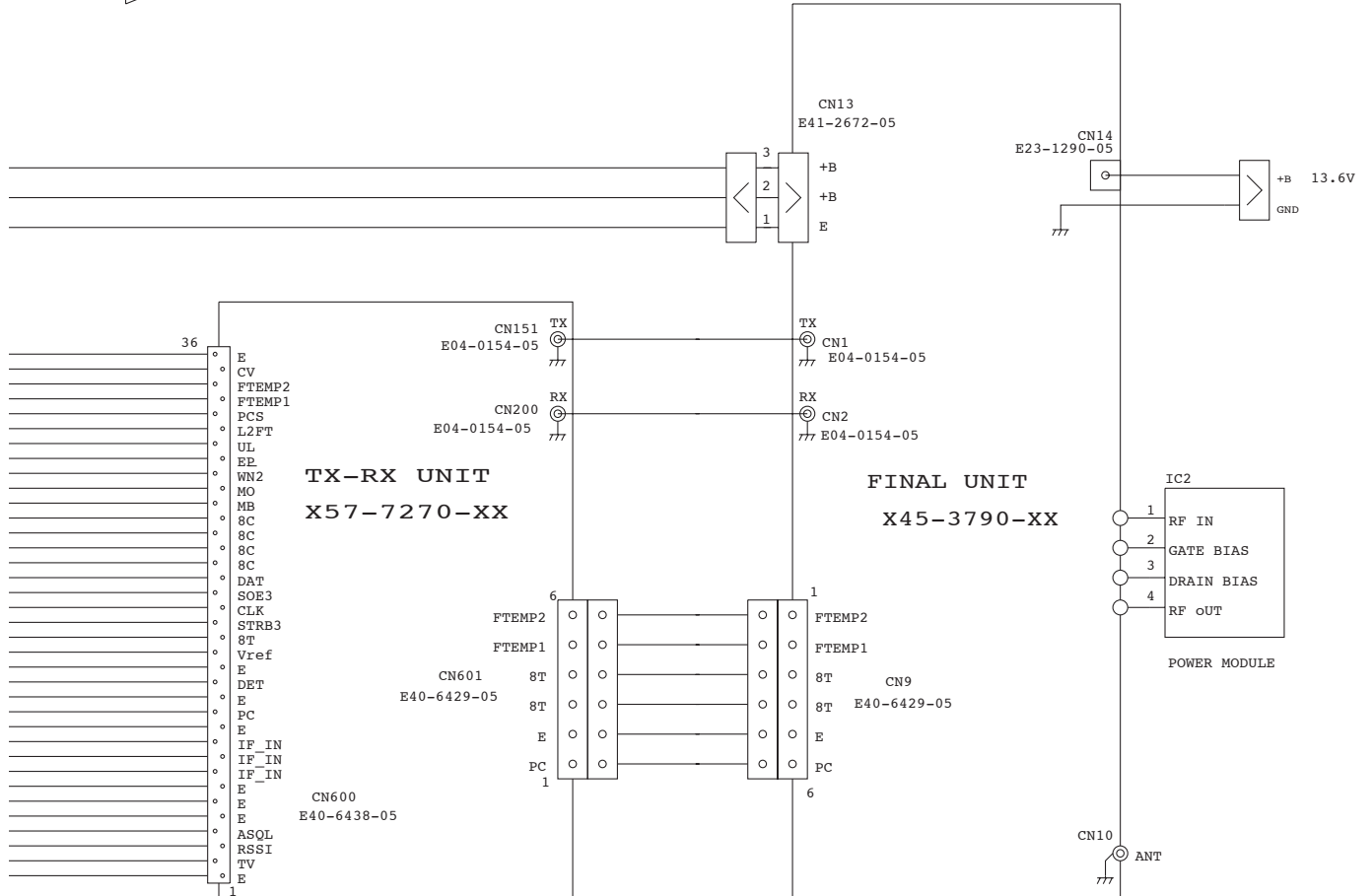
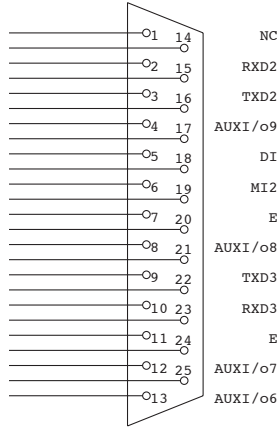
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TK-5810(B)

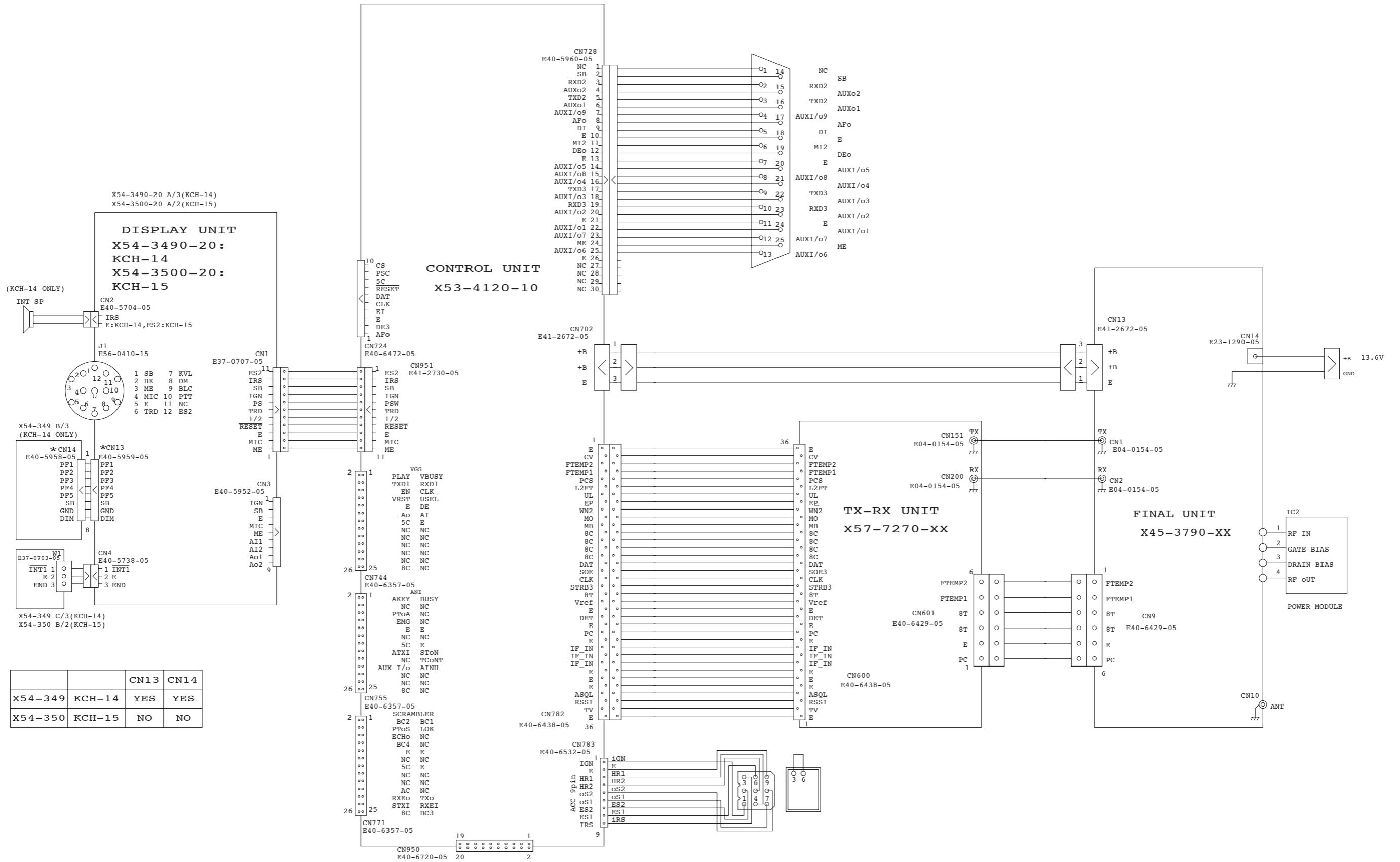
INTERCONNECTION DIAGRAM



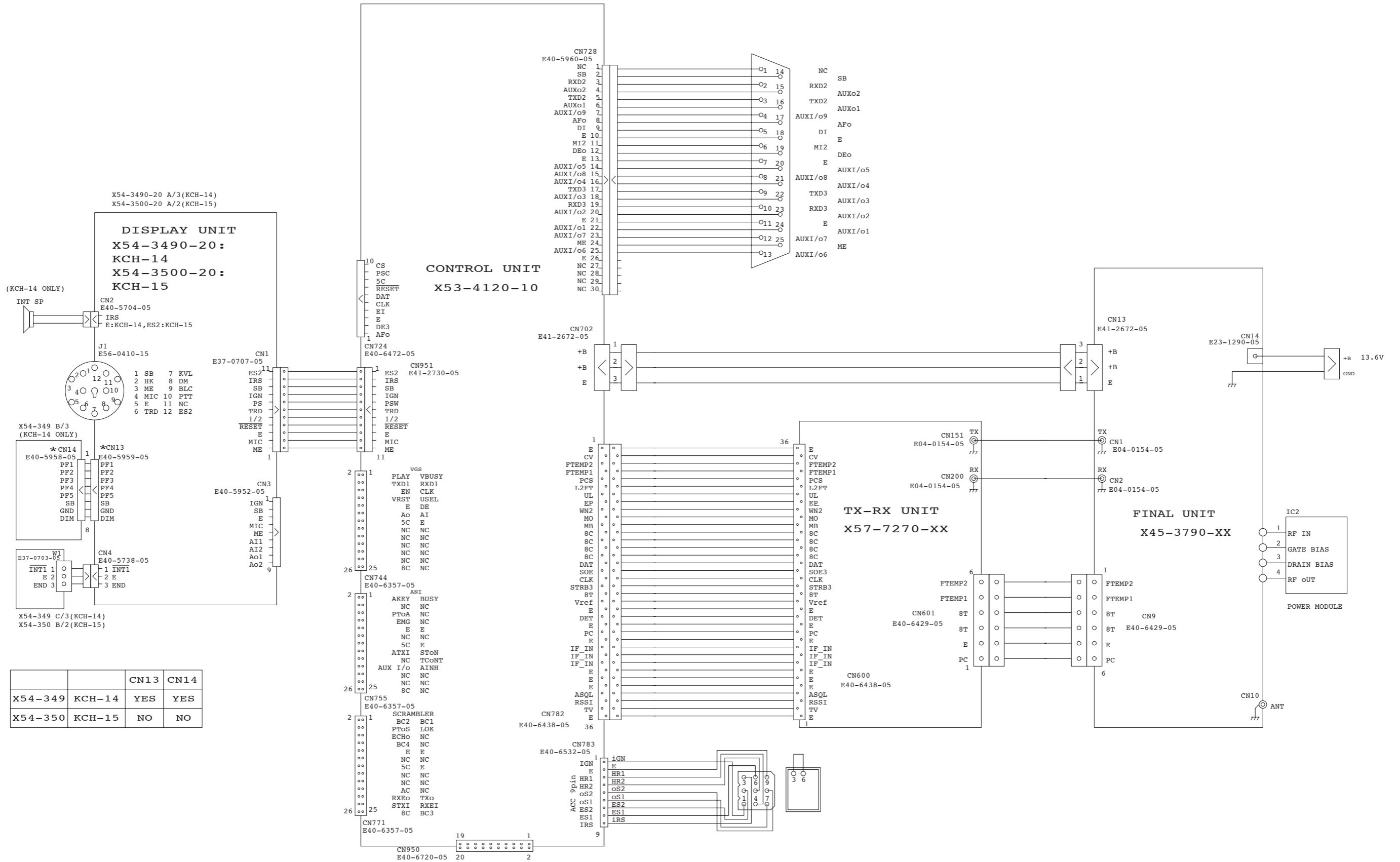
INTERCONNECTION DIAGRAM



INTERCONNECTION DIAGRAM

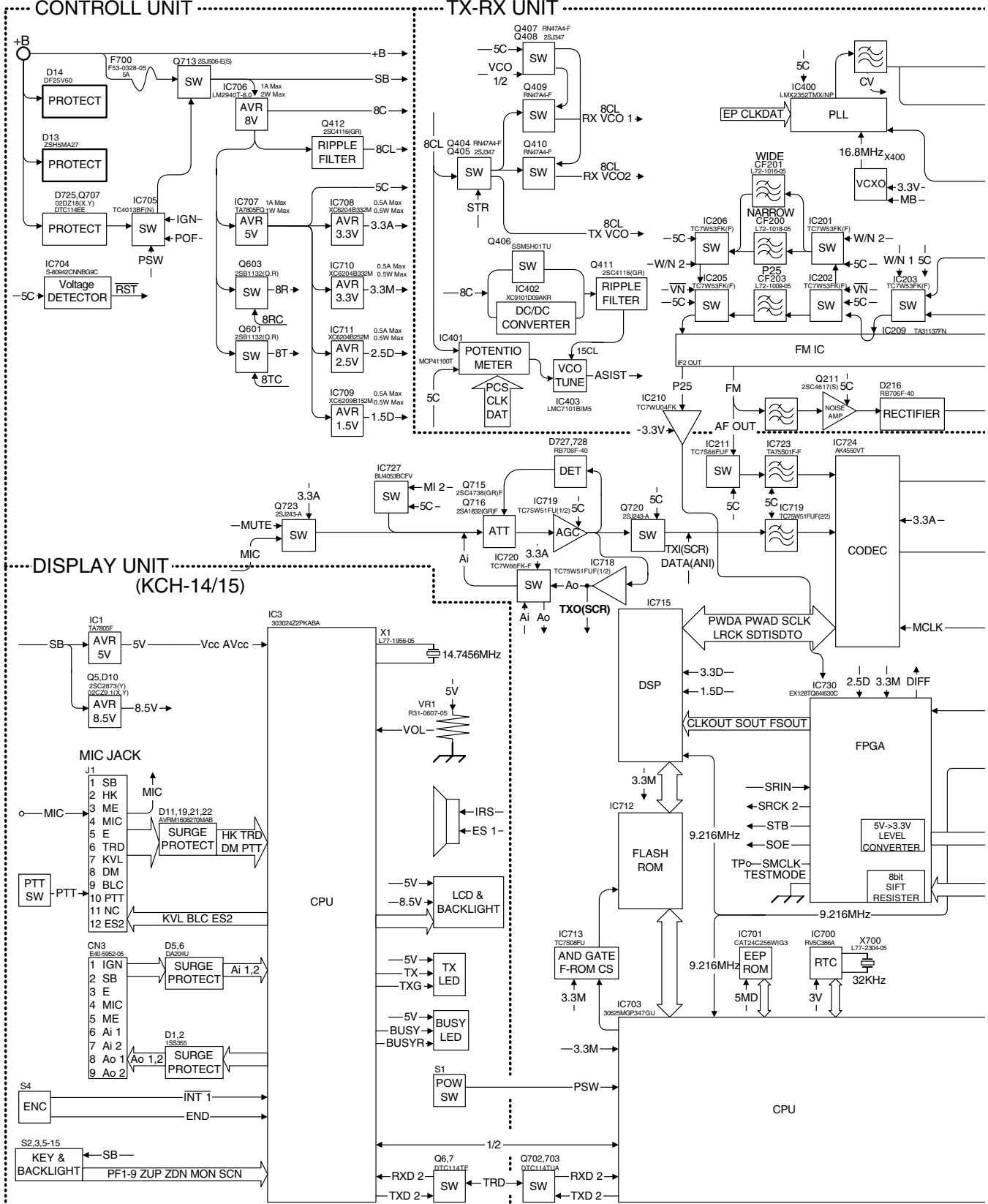


INTERCONNECTION DIAGRAM

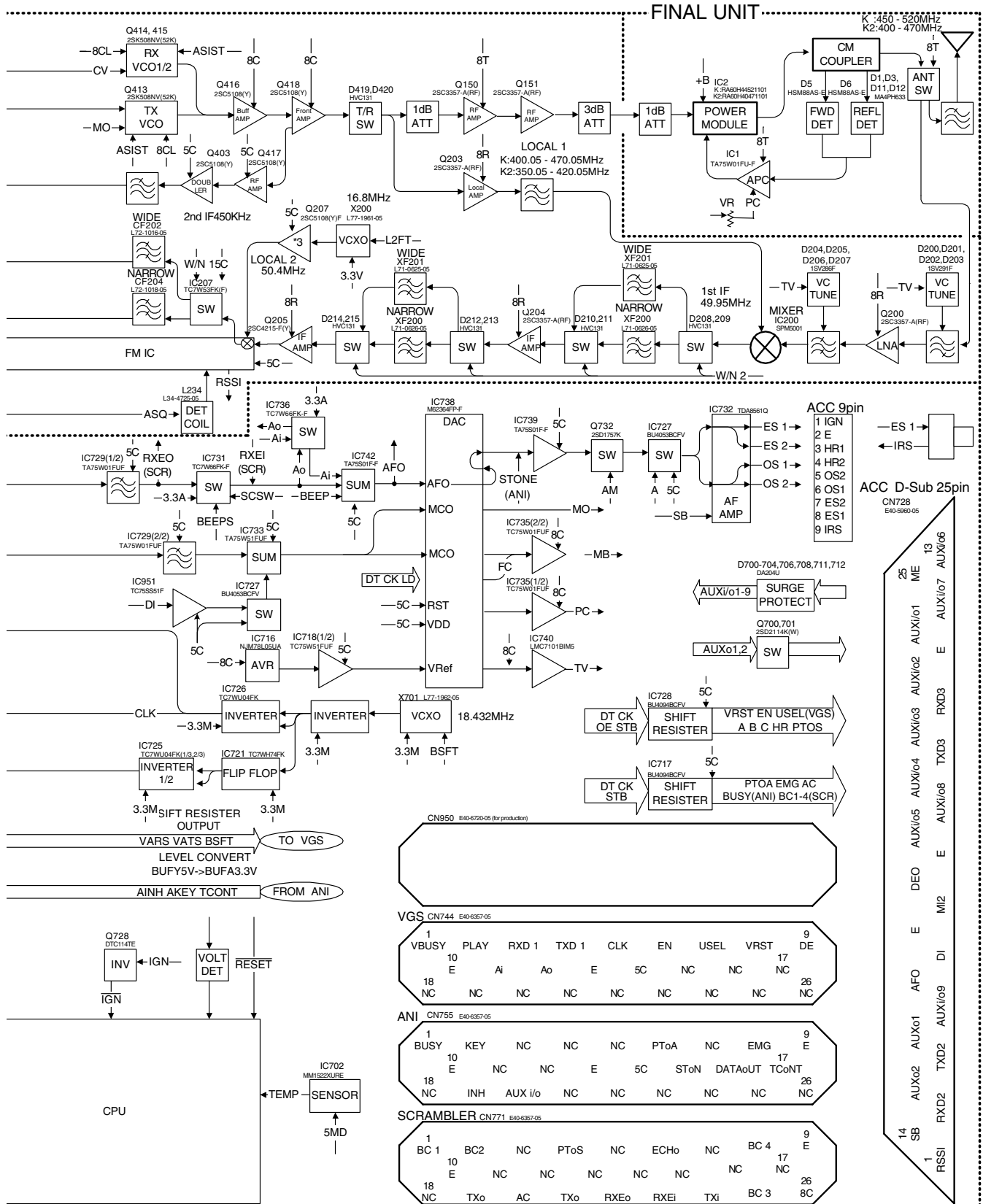


BLOCK DIAGRAM

TK-5810(B) BLOCK DIAGRAM

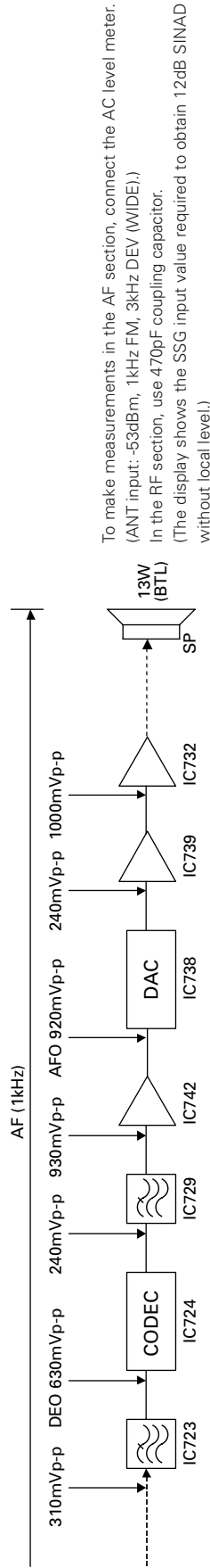
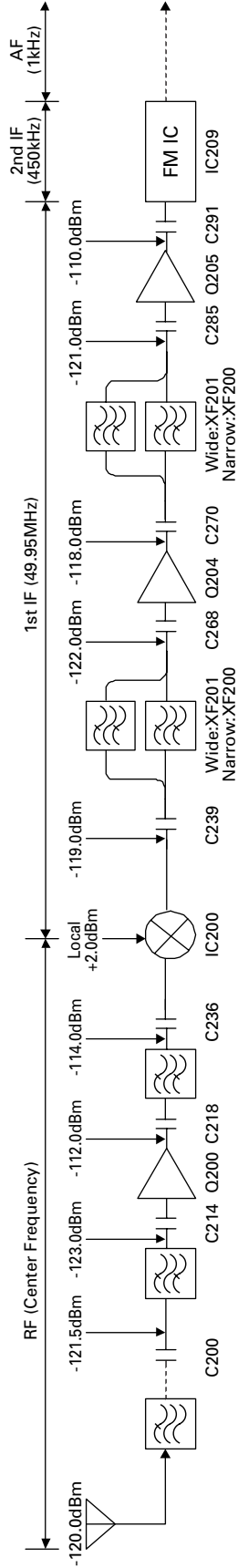


BLOCK DIAGRAM

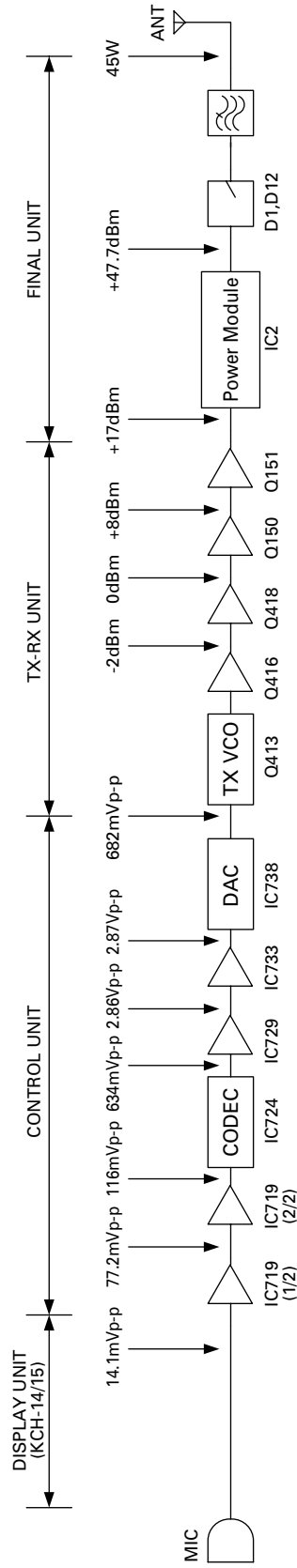


LEVEL DIAGRAM

Receiver Section



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.

TK-5810(B)

SPECIFICATIONS

GENERAL

Frequency Range	K : 450~520 MHz	K2 : 400~470 MHz
Number of Channels	512	
Zones	50	
Max. Channels per Zone	250	
Channel Spacing	Analog : 12.5/25 kHz	Digital : 12.5 kHz
Operating Voltage	13.6V DC \pm 15%	
Current Drain		
Standby	Less than 0.6A	
Receive	Less than 2.3A	
Transmit	14A	
Duty Cycle	Transmit : 20%	
Operating Temperature Range	-22°F to +140°F (-30°C to +60°C)	
Frequency Stability	\pm 2.0 ppm (-22°F to +140°F)	
Antenna Impedance	50 Ω	
Dimensions (W x H x D) (Projections included)		
RF Deck only	7.01" x 2.36" x 7.68" in.(178 x 60 x 195 mm)	
with KCH-14 or KCH-15	7.05" x 2.36" x 9.09" in.(179 x 60 x 231 mm)	
Weight (net)		
RF Deck only	5.2 lbs.(2.3kg)	
with KCH-14	6.2 lbs.(2.8kg)	
with KCH-15	6.2 lbs.(2.8kg)	

RECEIVER

Sensitivity	Digital (5% BER) : 0.25 μ V	Digital(1% BER) : 0.40 μ V	Analog 12dB SINAD : 0.25 μ V
Selectivity	Digital : -63dB	Analog @25kHz : -83dB	Analog @12.5kHz : -76dB
Intermodulation Distortion	Digital : -80dB	Analog @25kHz : -80dB	Analog @12.5kHz : -80dB
Spurious and Image	Digital : -90dB	Analog :- 90dB	
Audio Distortion	Digital : Less than 1.0%	Analog : Less than 2.0%	
Audio Output	Internal (KCH-14)@3%:1.5W/8 Ω	External:@3%:12W/4 Ω	
	Internal (KCH-14)@5%:1.625W/8 Ω	External:@5%:13W/4 Ω	

TRANSMITTER

RF Output Power	45W to 5W	
Spurious and Harmonics	80dB	
FM Hum and Noise	Analog @25kHz : 50dB	Analog @12.5kHz : 45dB
Microphone Impedance	600 Ω	
Audio Distortion	Less than 2%	
Modulation	16K0F3E, 11K0F3E, 8K10F1E, 8K10F1D, 20K0F7D, 11K2F7D, 14K4F1D, 7K20F1D	

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.

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Bolivia, 239-08020 Barcelona, Spain

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