VHF APCO P25 TRANSCEIVER

TK-5710(B)
TK-5710H(B)

SERVICE MANUAL

KENWOOD

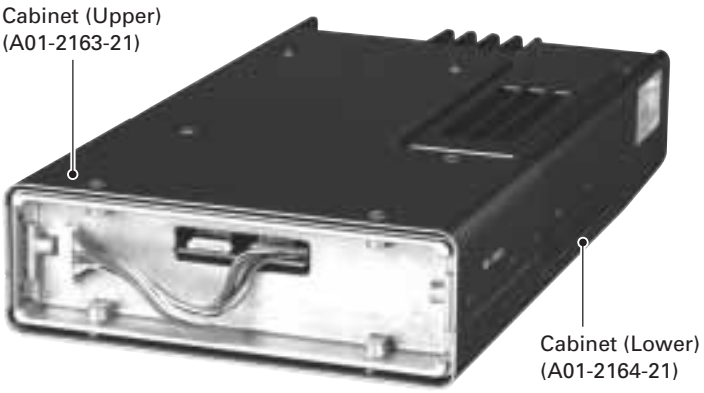
Kenwood Corporation

B51-8727-00 (S) 618

TK-5710(B) with KCH-14

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

TK-5710H(B)



CONTENTS

This product uses Lead Free solder

GENERAL

INTRODUCTION

SCOPE OF THIS MANUAL

This manual is intended for use by experienced technicians familiar with similar types of commercial grade communications equipment. It contains all required service information for the equipment and is current as of 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 2.00 or later for this transceiver. KPG-95D version 1.XX does not work properly.

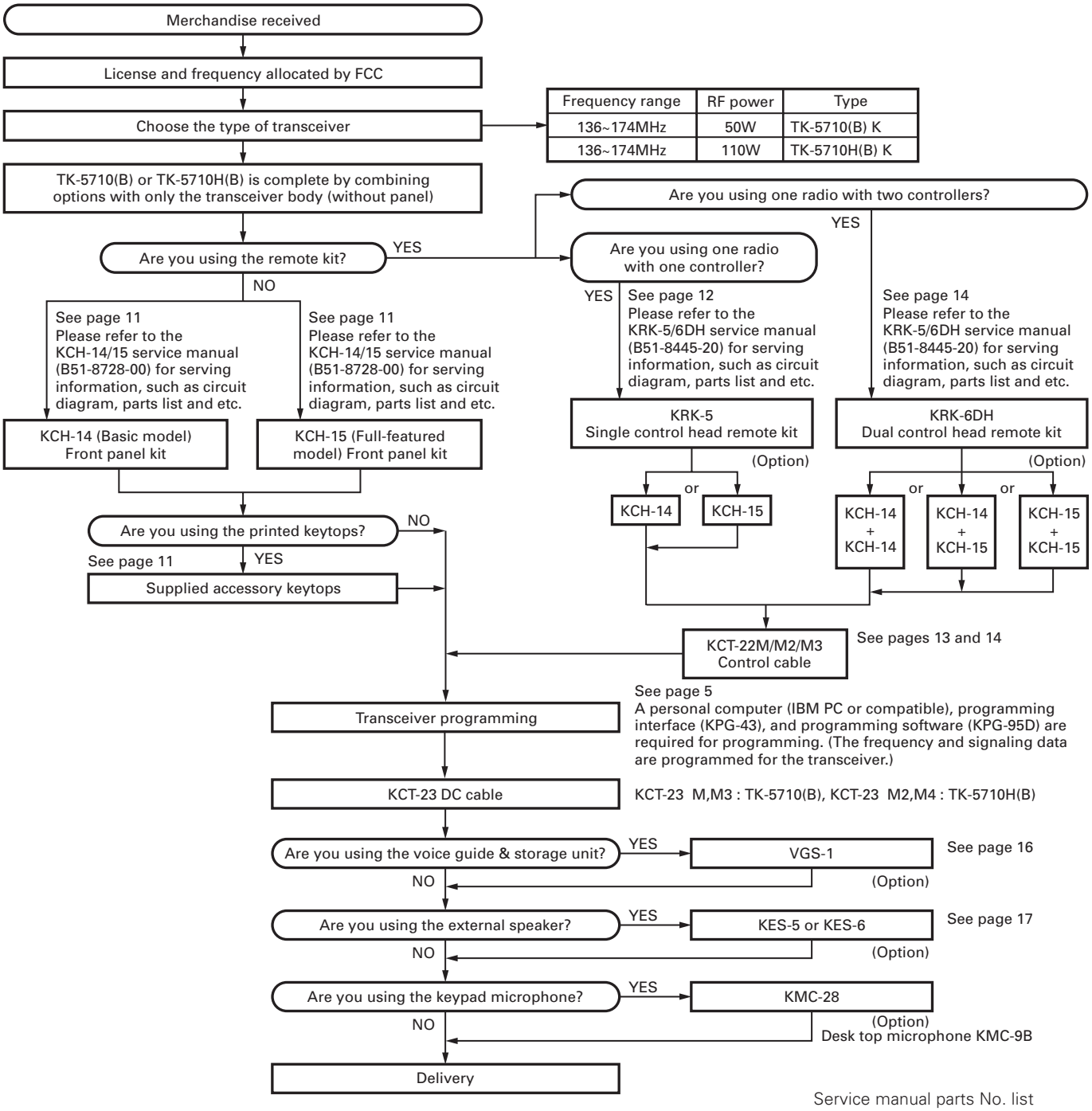
SYSTEM SET-UP

Before Reading About System Set-up

The TK-5710(B)/5710H(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))

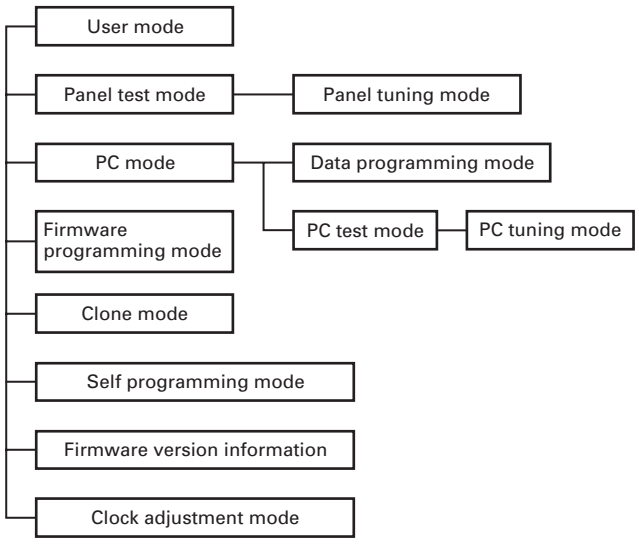


Service manual parts No. list

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.

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

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) 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.

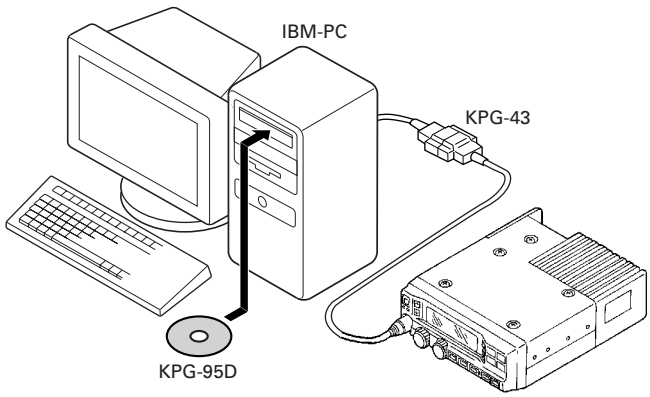


Fig. 1

5-2. Connection procedure

1. Connect the transceiver to the personal computer with the interface cable.
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.

REALIGNMENT

When data receiving to transceiver, the green LED is lights.

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

5-3. KPG-43 description (PC programming interface cable: Option)

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

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

5-4. Programming software KPG-95D description

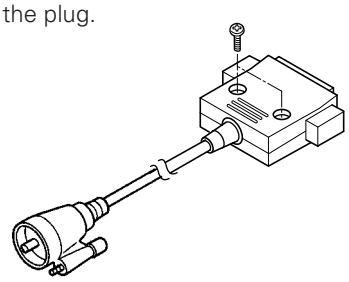
The KPG-95D is the programming software for the transceiver supplied on a CD-ROM. This software runs under MS-Windows 98, ME, Windows 2000 or XP on an IBM-PC or compatible machine.

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.

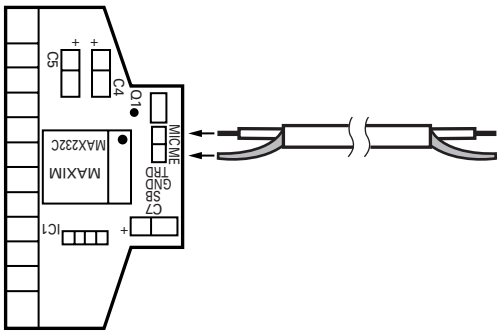
6. PC Tuning Mode

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

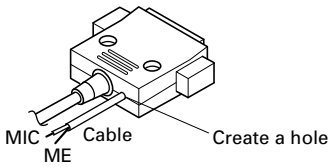
1. Remove the two screws from the plug cover, then lift the cover from the plug.



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



3. 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.



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) with the interface cable (KPG-43). (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.

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

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.

REALIGNMENT

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 master and the receive transceiver is a slave).

The following data cannot be cloned.

- Tuning data
- Embedded message with password
- Model name data
- ESN (Electronic Serial Number) data

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 master. 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 slave transceiver.
5. Connect the cloning cable (part No. E30-3370-05) to the microphone jacks on the master and slave.
6. Press the [PF2] key on the master while the master displays "CLONE MODE". The data of the master is sent to the slave. While the slave is receiving the data, "PROGRAM" is displayed. When cloning of data is completed, the master displays "END", and the slave automatically operates in the User mode. The slave can then be operated by the same program as the master.
7. The other slave can be continuously cloned. When the [PF2] key on the master is pressed while the master displays "END", the master displays "CLONE MODE". Carry out the operation in step 4 to 6.

Notes:

- Cannot be cloned if the overwrite password is programmed to the slave.
- "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.)

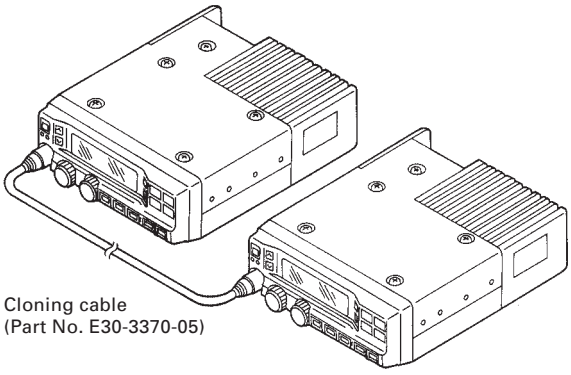
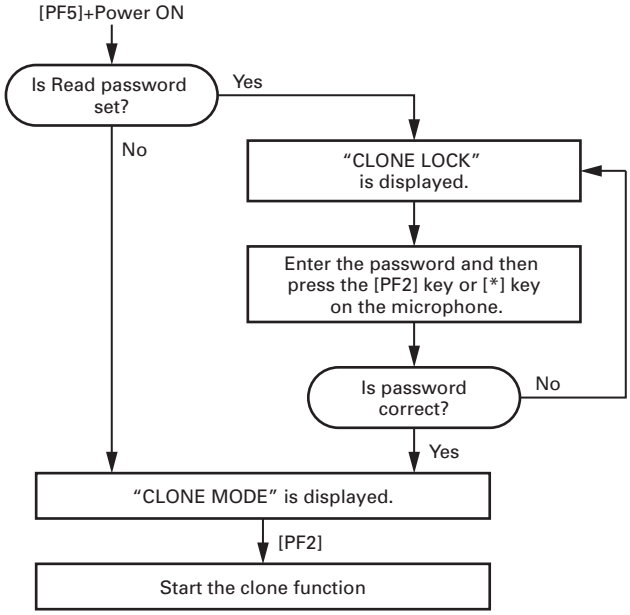


Fig. 2

- **Flow Chart (Master transceiver)**



REALIGNMENT

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.

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/APCO/MIXED
5	TX Mode	MODE	ANALOG/APCO
6	Channel Spacing	SPACE	25.0kHz/12.5kHz (When the Channel type is selected "ANALOG" or "MIXED".) APCO 12.5kHz/12.5kHz (When the Channel type is selected "APCO".)
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

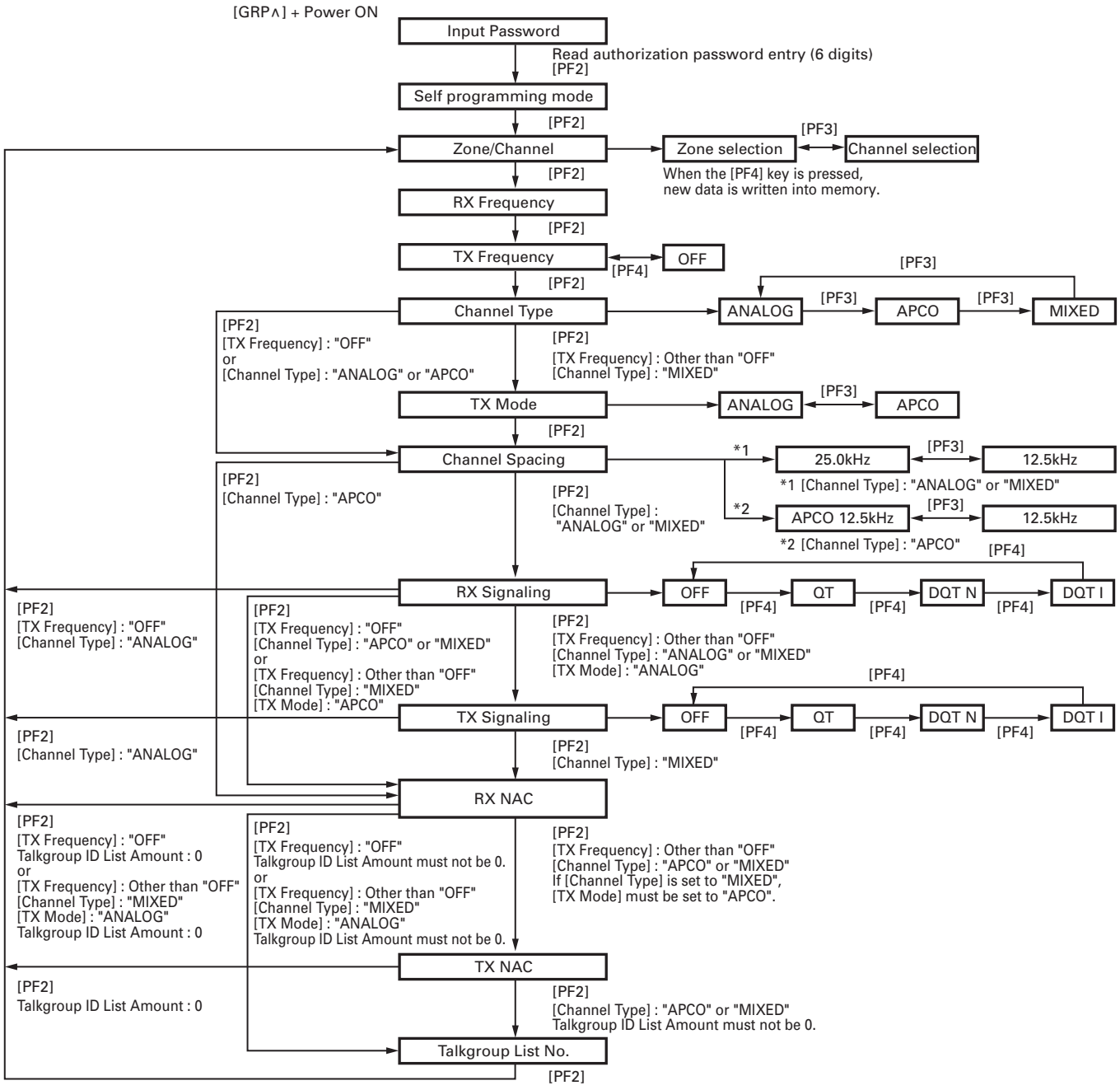
Key \ Item	Zone- Channel	RX Frequency	TX Frequency	Channel Type	TX Mode	Channel Spacing	RX Signaling	TX Signaling	RX NAC	TX NAC	TG List No.
[PF1]	Unused										
[PF2]	Go to the next item										
[PF3]	Zone/ Channel switching	2.5kHz/ 5kHz/ 6. 25kHz/ 7.5kHz/ 1MHz step switching		ANALOG/ APCO/ MIXED switching	ANALOG/ APCO/ 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
[GRP∨]	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			
[GRP∨]	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			

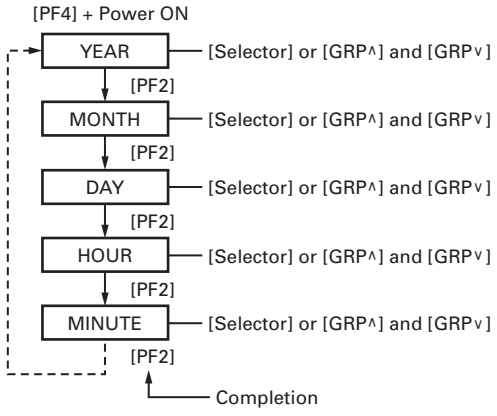
REALIGNMENT

- **Self programming mode flow chart**



10. Firmware Information Mode

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

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 (❶) 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 (❷).
   (2) Affix the sheet while taking note of the position of the three parts as shown in Fig.1-1-2 (❸).
   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 24)

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.

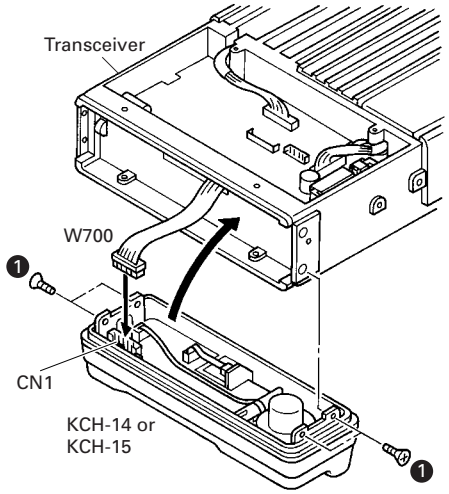


Fig. 1-1-1

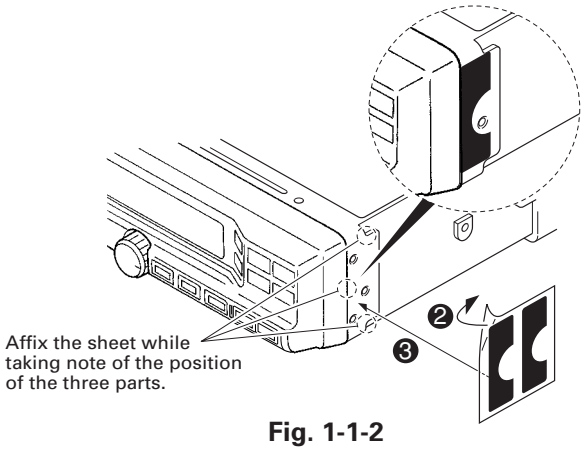


Fig. 1-1-2

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.

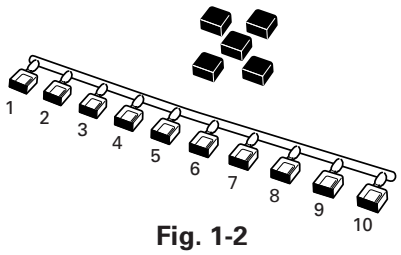


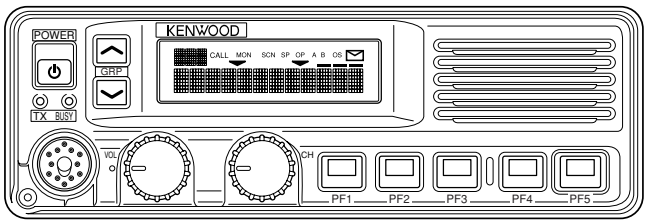
Fig. 1-2

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	∨	EMG
10	PA	No printing	■

No.	K29-9353-13	K29-9354-03	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	No printing	No printing
10	SES	No printing	No printing

INSTALLATION

KCH-14



KCH-15

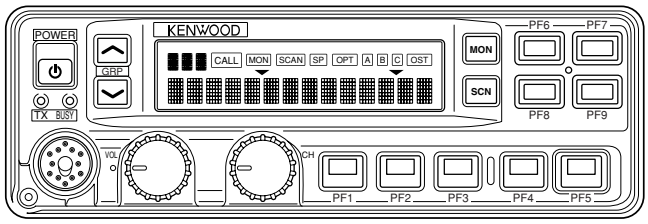


Fig. 1-3

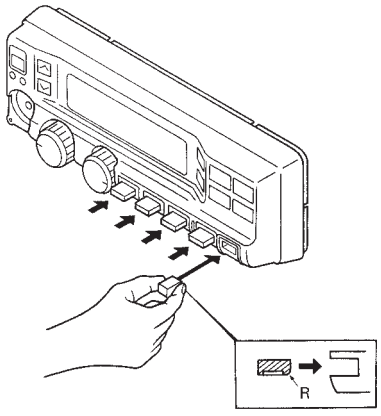


Fig. 1-4 Keytop insertion

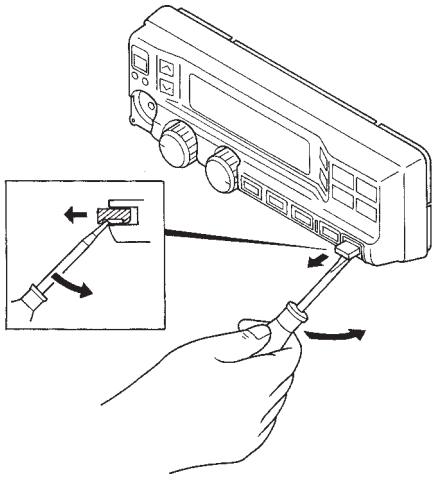


Fig. 1-5 Keytop removal

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 (❶).

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 (❷).
   (2) Affix the sheet while taking note of the position of the three parts as shown in Fig.2-1-2 (❸).
   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 24)

Note:

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

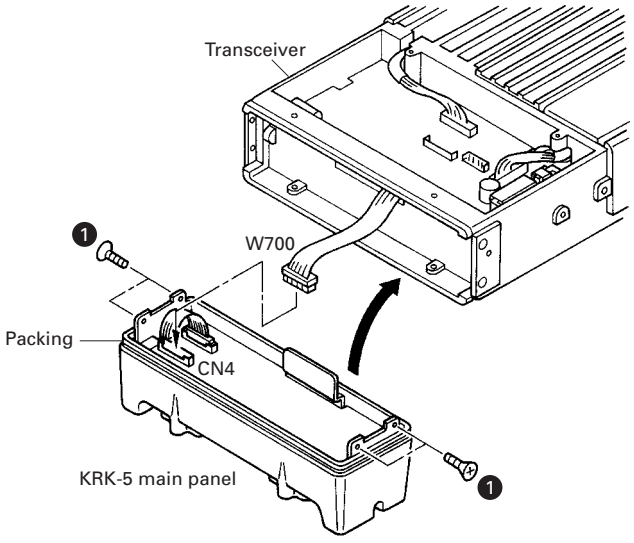


Fig. 2-1-1

INSTALLATION

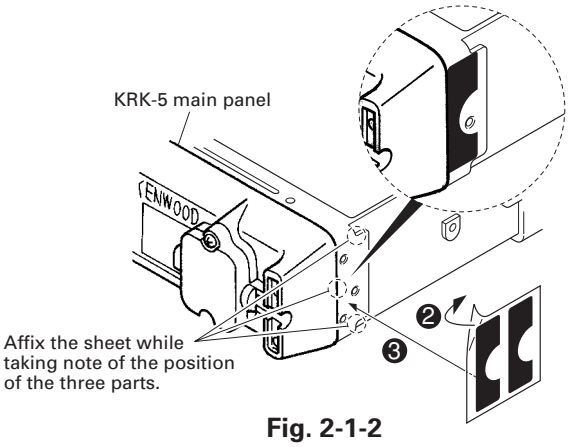


Fig. 2-1-2

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 (❶) 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 (❷).
3. Insert the lead wire with connector (W103) of the KRK-5 into the connector (CN3) of the front panel kit (❸).
4. Make a slight cut in the end of the rubber cap (❹).
5. Slide the lead wire of the connector wiring (❺) through the slit in the rubber cap (❻).
6. Insert the rubber cap into the hole of the KRK-5 rear panel (❼).
7. Insert the connector (❽) to the ACC connector (❾) on the KRK-5 sub panel as shown by the arrow (❿).
8. Install the KRK-5 sub panel onto the sub panel of the front panel kit (⓫).
9. Install the KRK-5 sub panel to the sub panel of the front panel kit using four screws (⓬).
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 (⓭).

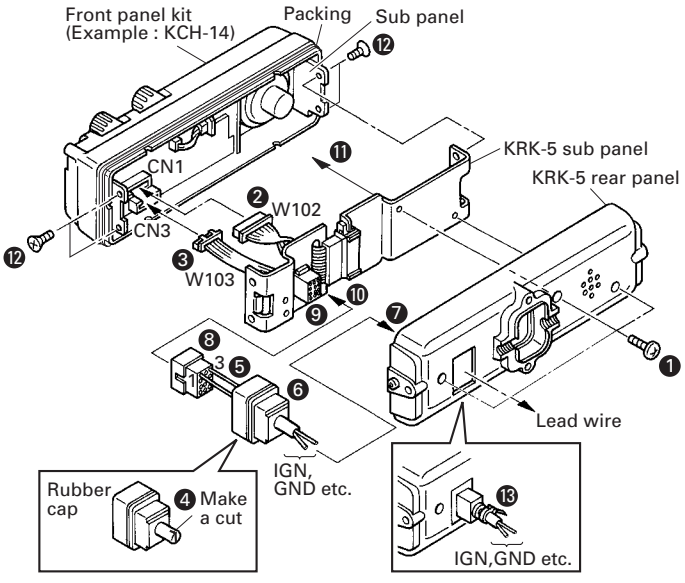


Fig. 2-2

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 (❶) supplied with the control cable.
2. Secure the one connector of the control cable to the KRK-5 main panel with two screws (❷) 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 (❸) supplied with the KRK-5.
3. Secure the other connector of the control cable to the display with two screws (❹) in the same way.

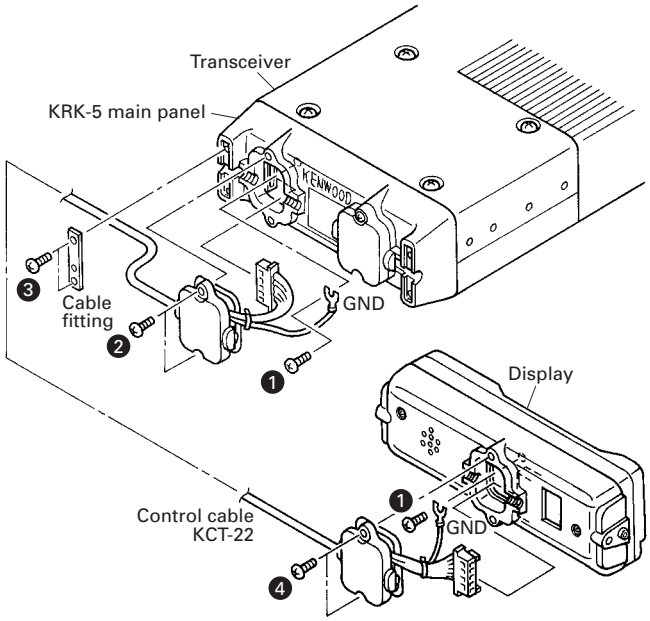


Fig. 2-3

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

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

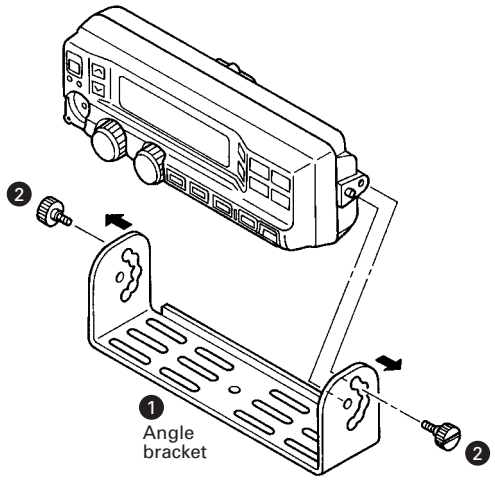


Fig. 2-4

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 (❶).

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 (❷).
   (2) Affix the sheet while taking note of the position of the three parts as shown in Fig.3-1-2 (❸).
   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 24)

Note:

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

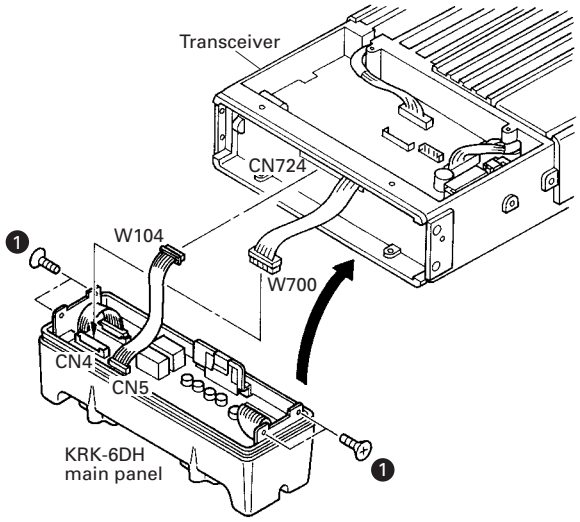


Fig. 3-1-1

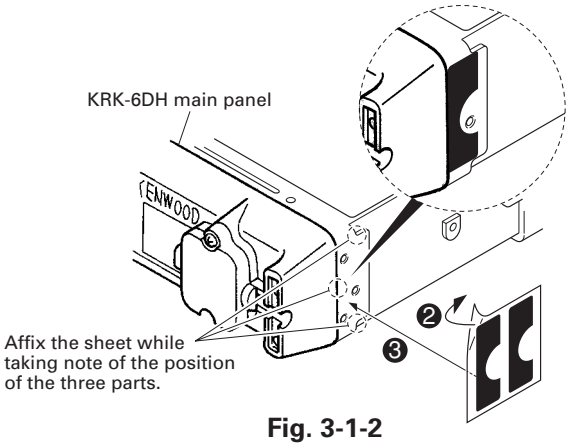


Fig. 3-1-2

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

Install each KRK-6DH rear panel onto each front panel kit as same as "2-2.Install the KRK-5 rear panel onto the front panel kit" described on page 13.

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 (❶) supplied with each control cable.
2. Secure the one connector of each control cable to the KRK-6DH main panel with two screws (❷) 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 (❸) supplied with the KRK-6DH.
3. Secure the other connectors of the control cables to the display 1 and display 2 with two screws (❹) in the same way.

INSTALLATION

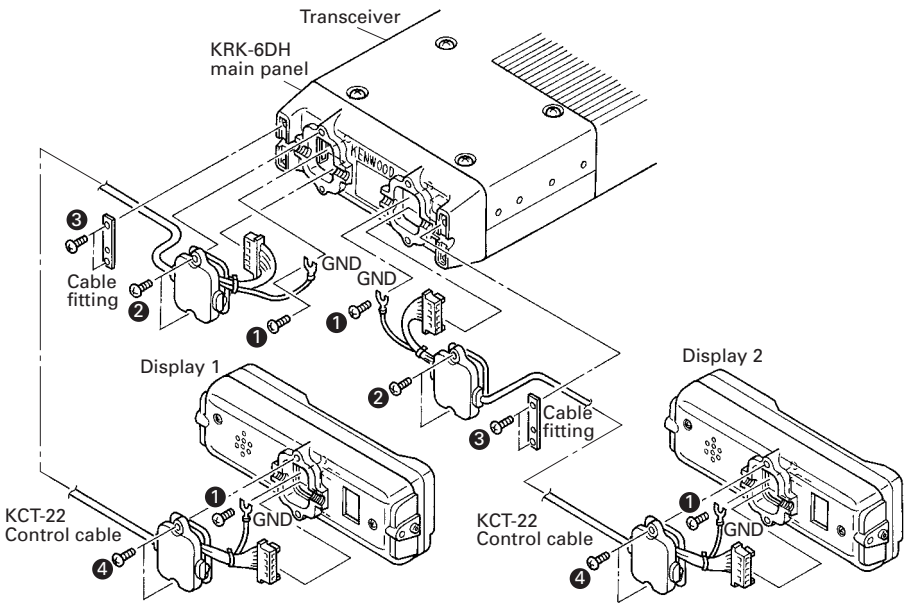


Fig. 3-2

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.

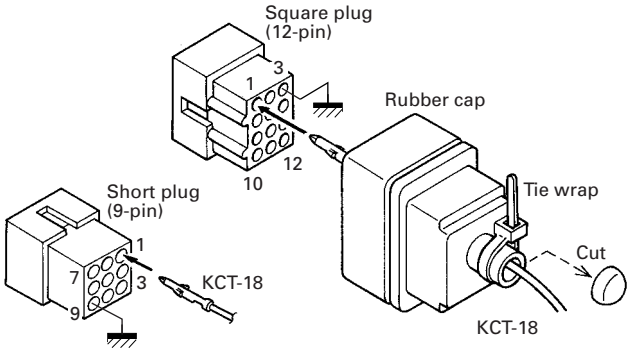


Fig. 4-1 **Fig. 4-2**

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.

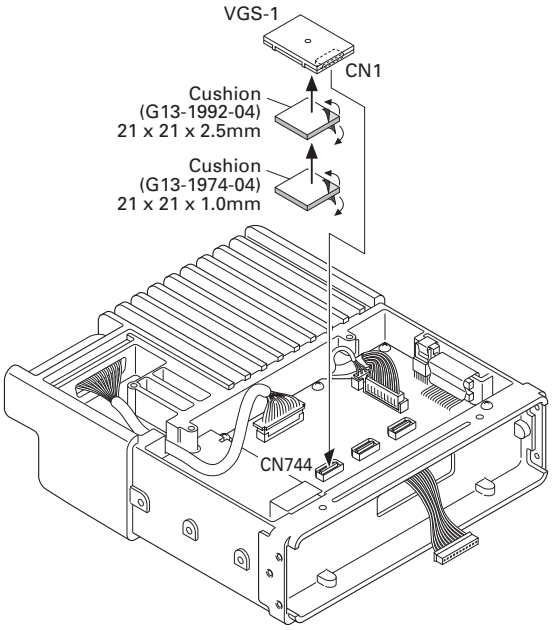


Fig. 5

6. Voice Scrambler Board Connection

1. Remove the upper case and upper packing of the transceiver.
2. Two kinds of the scrambler board are available, and the following describes the each installation method.

- **How to install the scrambler board (Connector connection type)**
  (1) Attach two cushions to the scrambler board as shown in Fig.7-2.

  Note:
  Be sure not to cover the scrambler board connector with the cushion.

  (2) Insert the scrambler board into the control unit connector (CN771).

- **How to install the scrambler board (Lead wire connection type)**
  (1) Attach the cushion to the scrambler board as shown in Fig.7-2.
  (2) Solder each lead wire of the scrambler board to a necessary location of each landing on the component side of the control unit.

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

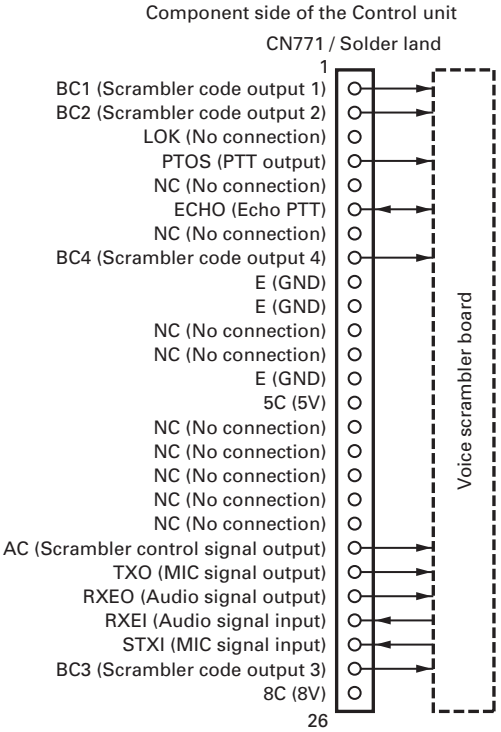


Fig. 6

INSTALLATION

7. ANI Board Connection

1. Remove the upper case and upper packing of the transceiver.
2. Attach the cushion to the ANI board as shown in Fig.7-2.
3. Solder each lead wire of the ANI board to a necessary location of each landing on the component side of the control unit.

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

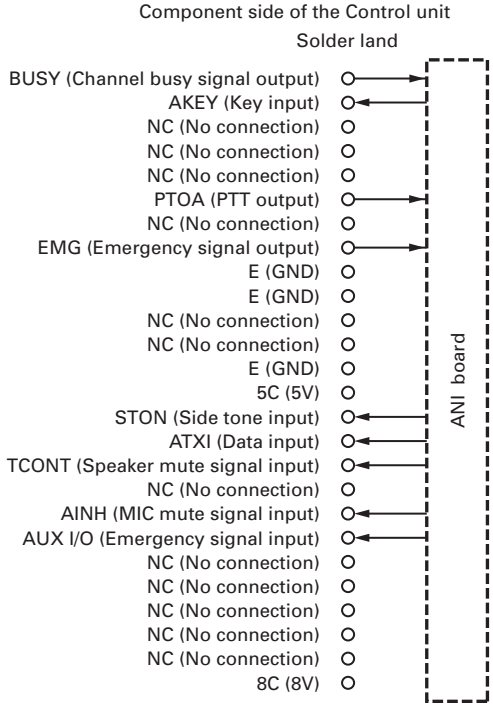


Fig. 7-1

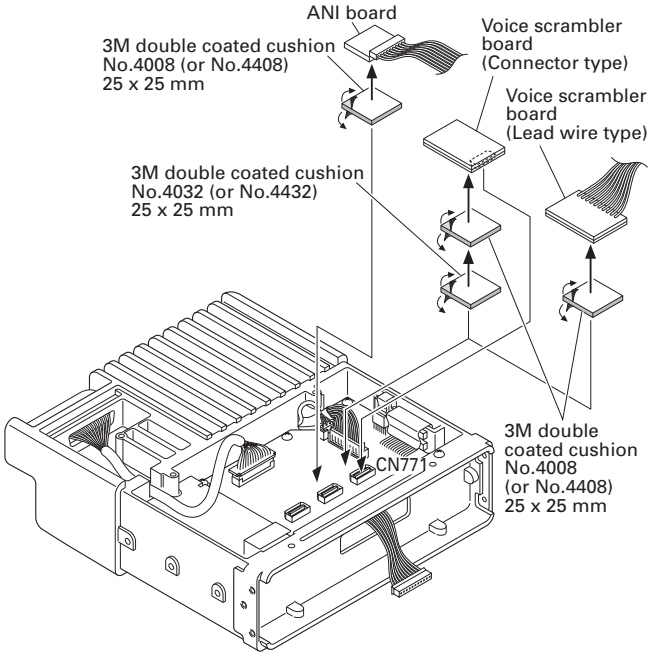


Fig. 7-2

8. 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.

8-1. 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. 8-1-1).
   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. 8-1-2)
   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. 8-1-3).
4. Connect the short plug to the accessory connector (9-pin) on the rear of the transceiver.

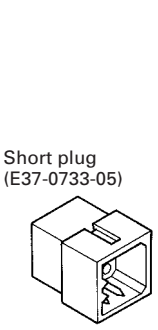


Fig. 8-1-1

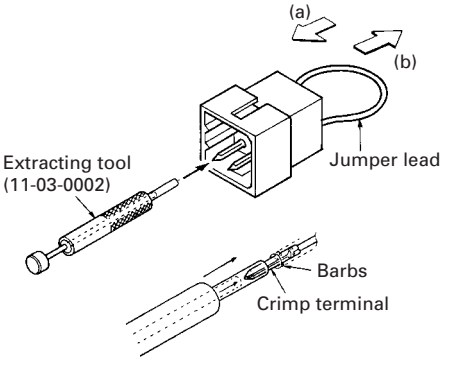


Fig. 8-1-2

INSTALLATION

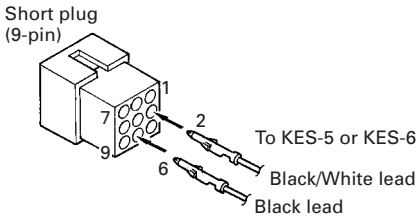


Fig. 8-1-3

8-2. 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.

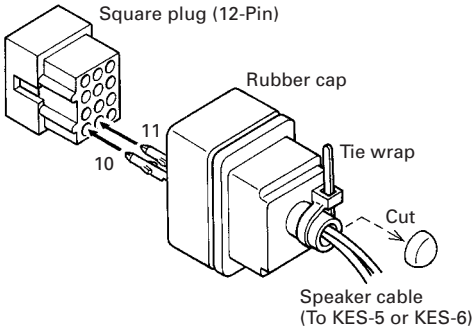


Fig. 8-2-1

- **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.

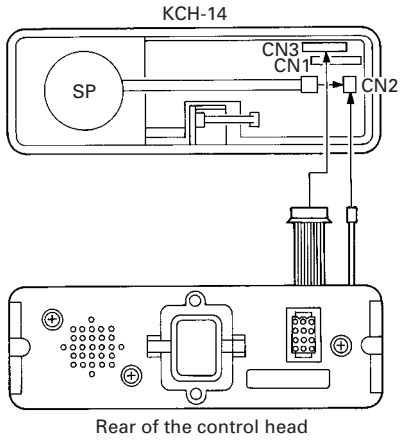


Fig. 8-2-2

8-3. Modification to increase the audio output of the control head

The speaker output can be increased to 13W by moving jumper resistor (0 ohm) R74 to $R73 on the KCH-14 display unit (X54-349 A/3). In this case, the KCH-14 internal speaker cannot be used because the maximum input (3W) of the internal speaker is exceeded. Therefore, use the KES-5 or KES-6.

Note :

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

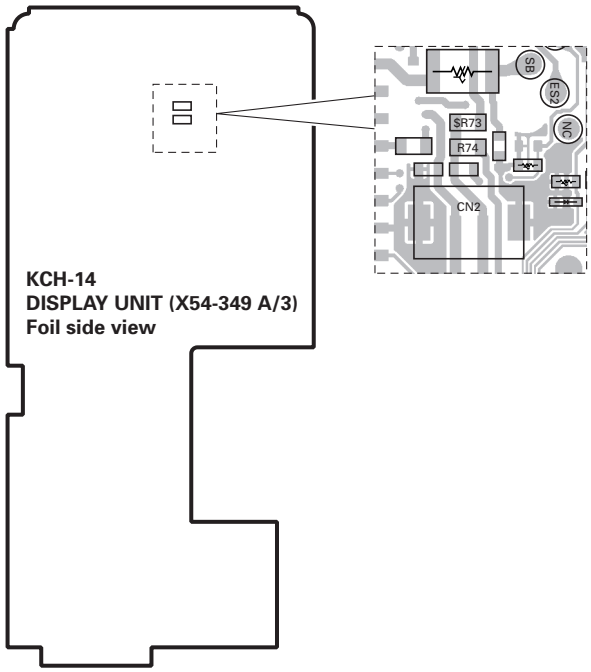


Fig. 8-3

8-4. 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 8-1 on page 17.)
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

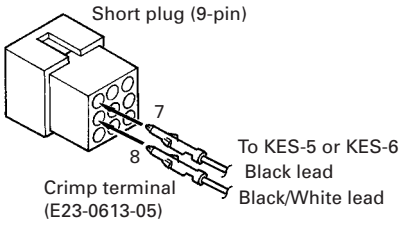


Fig. 8-4

9. 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	HR1 / HR2	HR1 / HR2

Table 1

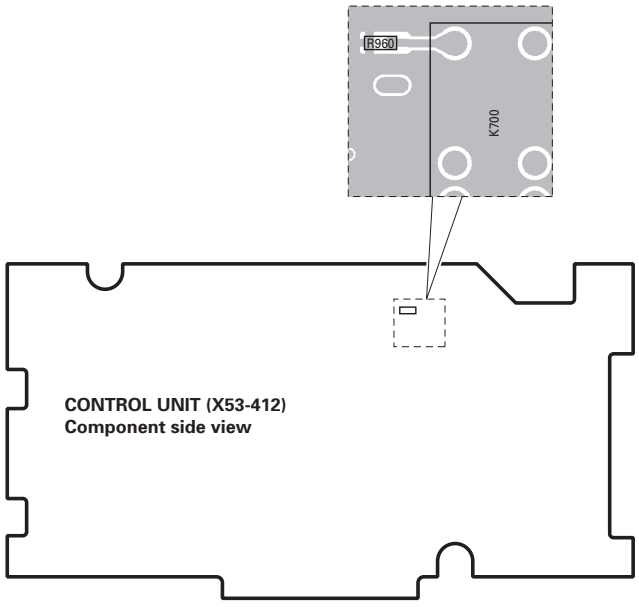


Fig. 9

DISASSEMBLY FOR REPAIR

Disassembly Procedure (TK-5710 (B))

■ Removing the upper/ lower case and shield cover

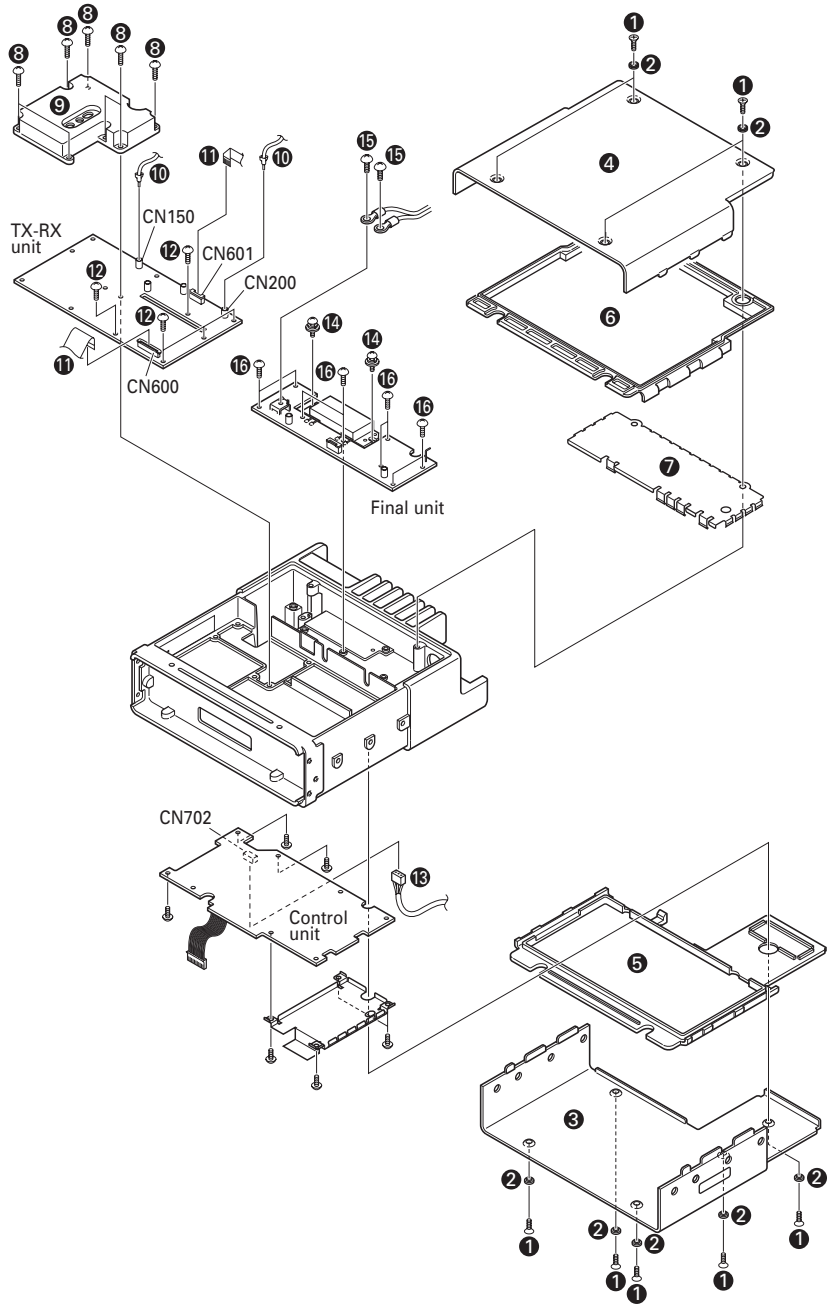
1. Remove the 9 screws ❶ and 9 spacers ❷.
2. Remove the upper case ❸ and lower case ❹.
3. Remove the upper packing ❺ and lower packing ❻.
4. Remove the shield cover ❼.

■ Removing the TX-RX unit (X57-703)

1. Remove the 7 screws ❽ holding the PLL shield cover.
2. Remove the PLL shield cover ❾.
3. Remove the coaxial cables from the two connectors (CN150, CN200) of the TX-RX unit ❿.
4. Remove the flat cables from the two connectors (CN600, CN601) of the TX-RX unit ⓫.
5. Remove the 5 screws ⓬.

■ Removing the Final unit (X45-375)

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



DISASSEMBLY FOR REPAIR

Disassembly Procedure (TK-5710H (B))

■ Removing the upper/ lower case and shield cover

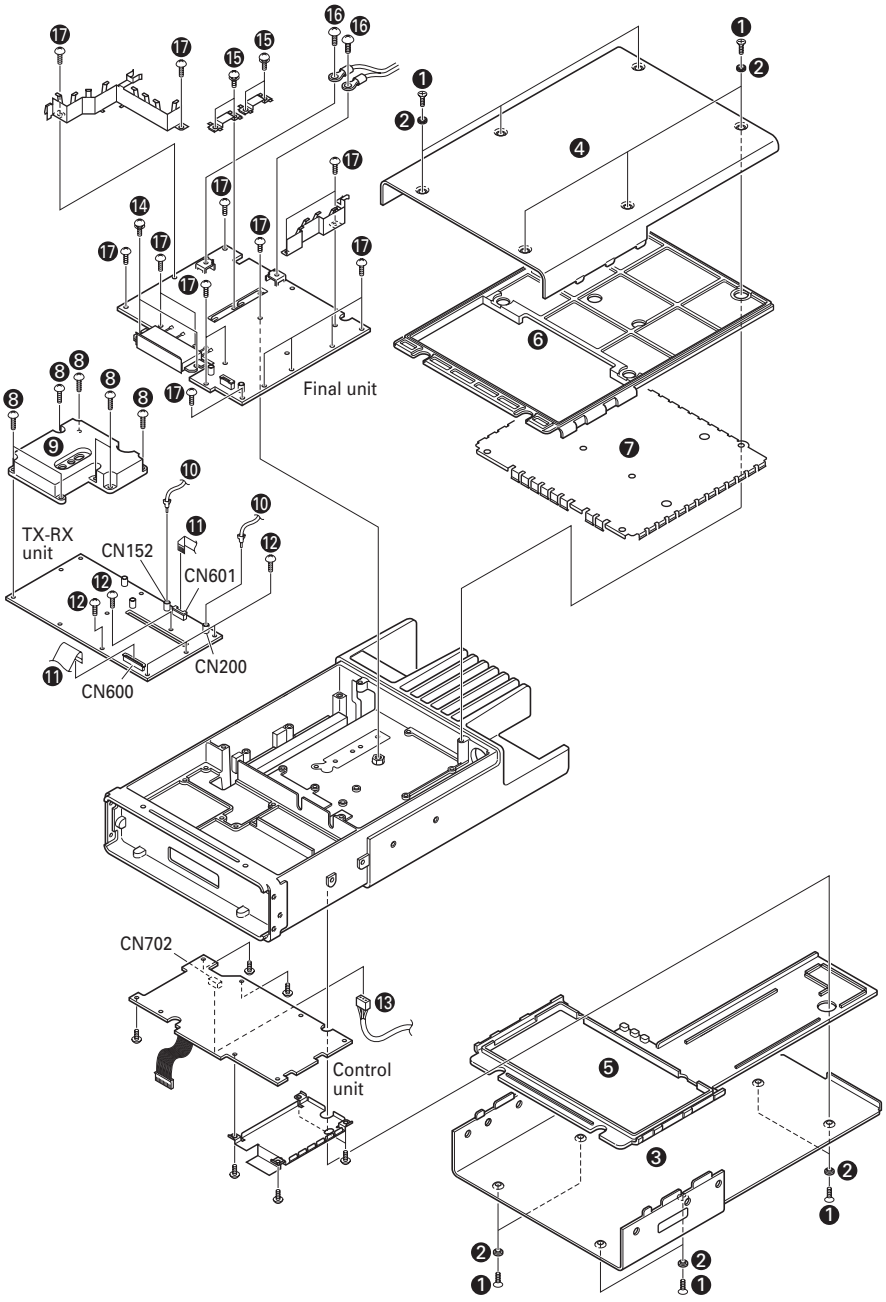
1. Remove the 12 screws ❶ and 12 spacers ❷.
2. Remove the upper case ❸ and lower case ❹.
3. Remove the upper packing ❺ and lower packing ❻.
4. Remove the shield cover ❼.

■ Removing the TX-RX unit (X57-703)

1. Remove the 7 screws ❽ holding the PLL shield cover.
2. Remove the PLL shield cover ❾.
3. Remove the coaxial cables from the two connectors (CN152, CN200) of the TX-RX unit ❿.
4. Remove the flat cables from the two connectors (CN600, CN601) of the TX-RX unit ⓫.
5. Remove the 5 screws ⓬.

■ Removing the Final unit (X45-376)

1. Remove the cables from the connector (CN702) of the control unit ⓭.
2. Remove the 2 screws ⓮ holding the power module.
3. Remove the solder of the power module with a solder absorber.
4. Remove the 4 screws ⓯ holding the two final transistors.
5. Remove the 2 screws ⓰ holding the + (positive) terminal and - (negative) terminal of the power supply cable.
6. Remove the 16 screws ⓱ holding the final unit.
7. Remove the solder of the antenna receptacle with a solder absorber.



DISASSEMBLY FOR REPAIR

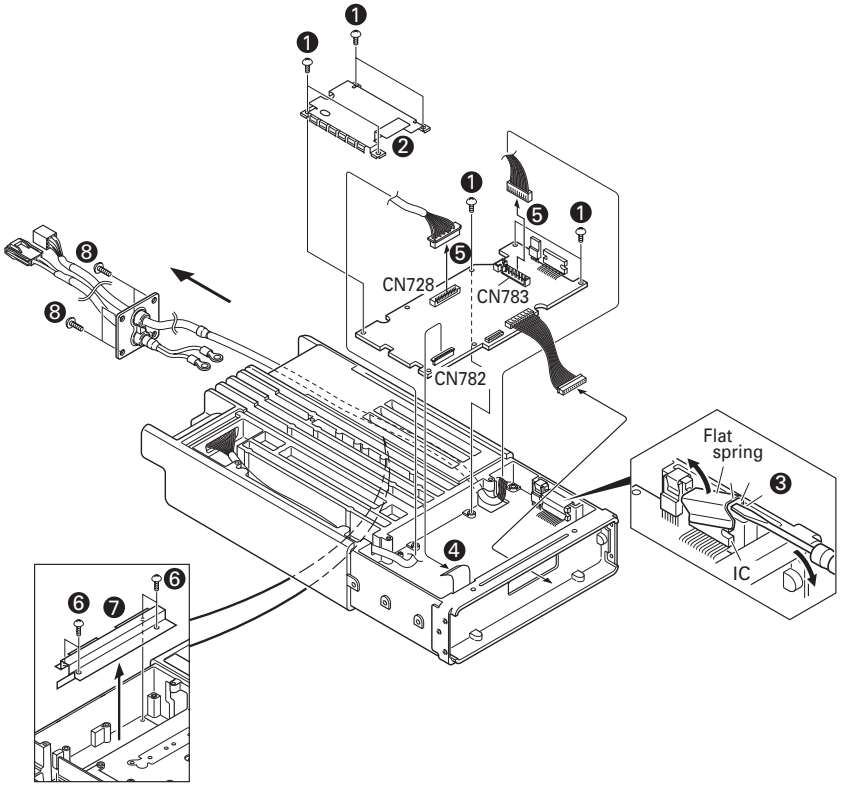
Disassembly Procedure (TK-5710 (B) / 5710H (B))

■ Removing the Control unit (X53-412)

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

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

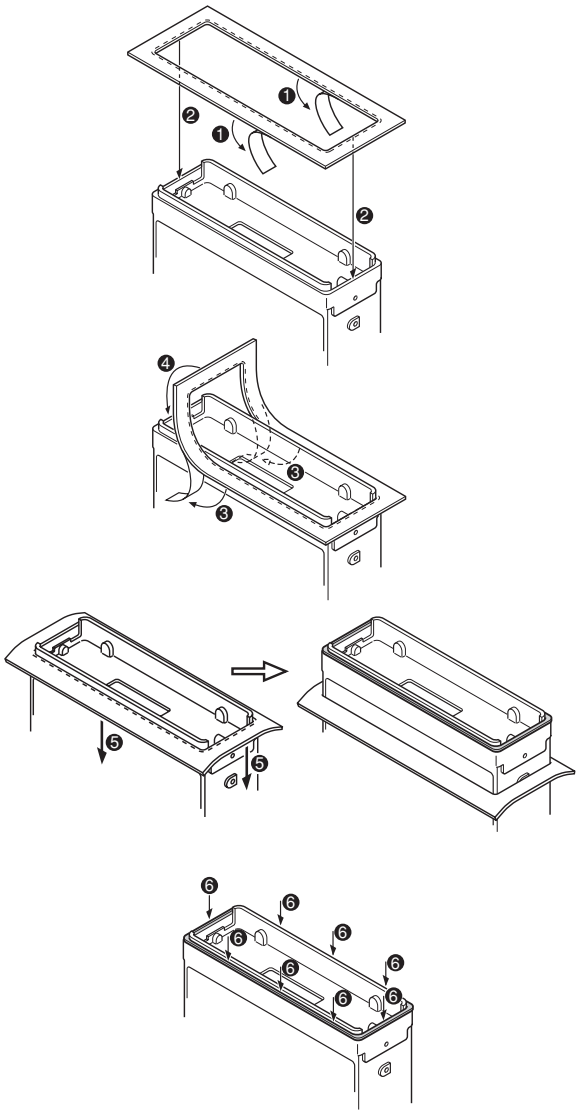
1. Confirm the following contents.
   - The screws holding the + (positive) terminal and - (negative) terminal of the power supply cable is removed.
   - The cable from the connector (CN783) of the Control unit is removed.
2. Remove the 4 screws ❻ holding the shield plate, and remove the shield plate ❼ from the chassis (TK-5710H(B) only).
3. Remove the 4 screws ❽ on the rear of the transceiver.
4. Pull out the power supply cable and accessory cable.



Precautions for Reassembly

■ Affixing the sheet (G11-4381-04)

1. Remove the covering paper from one side of the sheet ❶.
2. Place the sheet on the front side of the chassis ❷, then affix it to one side of the front chassis.
   Firmly affix the sheet to the chassis by pushing the double-coated tape with your fingers.
3. Remove the covering paper from other side of the sheet ❸, then affix it to the other side of the front chassis ❹.
   Firmly affix the sheet to the chassis by pushing the double-coated tape with your fingers.
4. Push the sheet toward the rear of the chassis ❺, then cut away any unnecessary parts of the sheet.
5. Firmly affix the sheet to the chassis by pushing the double-coated tape with your fingers ❻.



DISASSEMBLY FOR REPAIR

■ Painting the lubricant (Part No.:490-0019-05) on the groove of the case packing

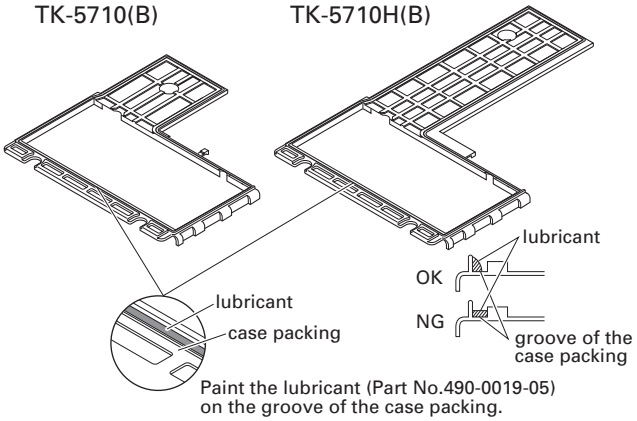
Paint the lubricant to the position as shown in figure after replacing or assembling the case packing.

Note :

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

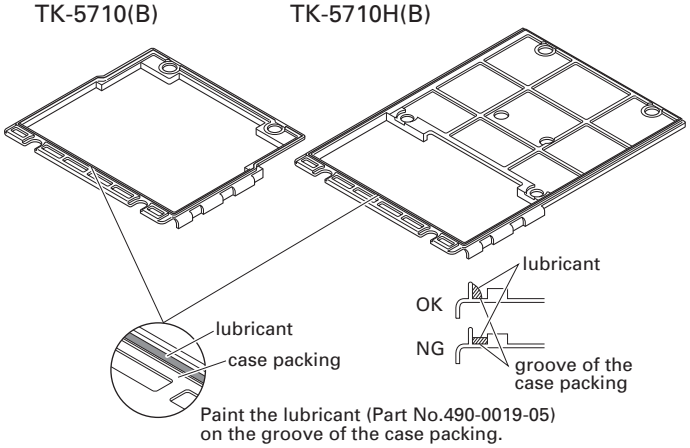
• Case packing (Upper)

TK-5710(B) TK-5710H(B)



• Case packing (Lower)

TK-5710(B) TK-5710H(B)



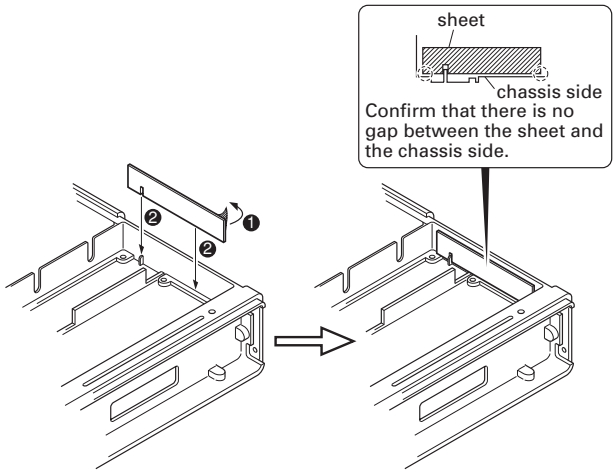
■ Affixing the sheet (G11-4378-04):TK-5710(B) only

1. Remove the covering paper of the sheet ❶.
2. Affix it to one side of chassis, so that the hollow of the sheet fits the convex of the chassis ❷.

Note :

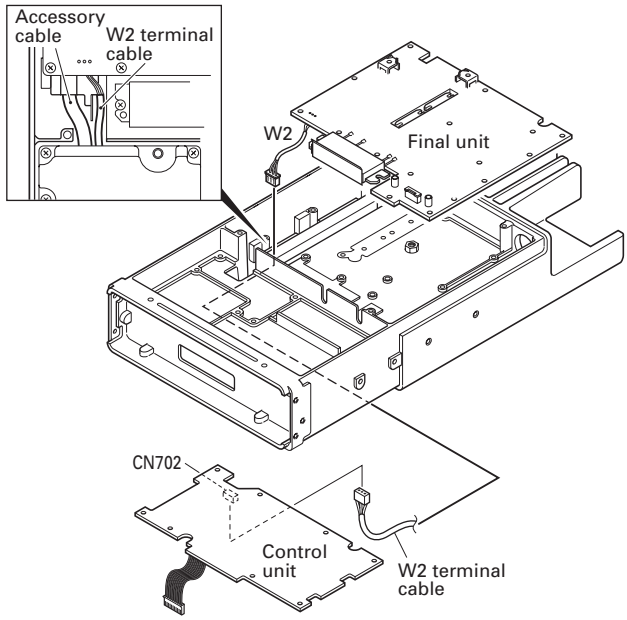
Affix it so as not to leave a gap between the sheet and the chassis side.

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



■ Align the cable connecting the W2 terminal: TK-5710H(B) only

When you assemble the final unit, align the cable connecting the W2 terminal as shown in figure, then insert it into the connector (CN702) of the control unit.

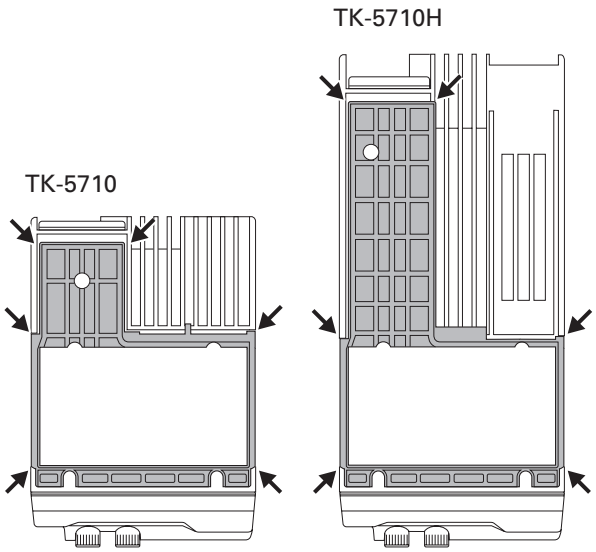


DISASSEMBLY FOR REPAIR

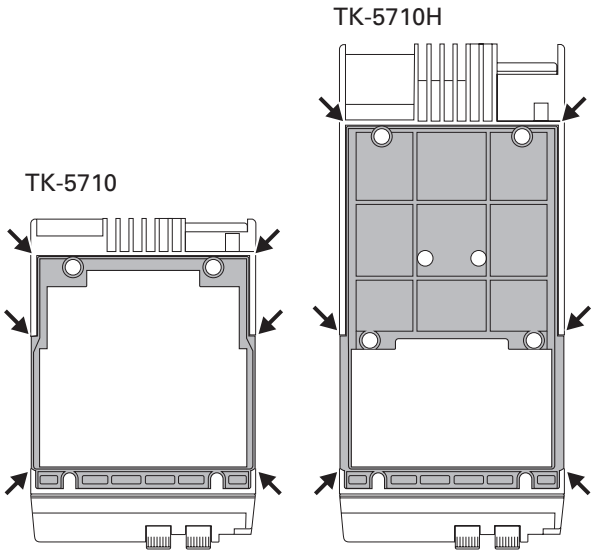
■ Procedures after installing the case packing to the chassis

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)



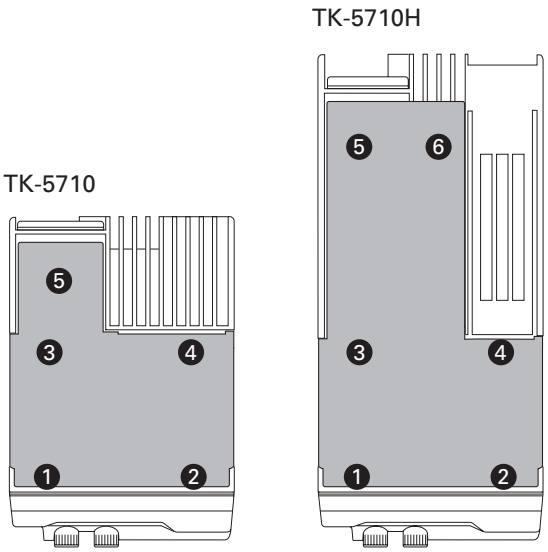
• Case packing (Lower)



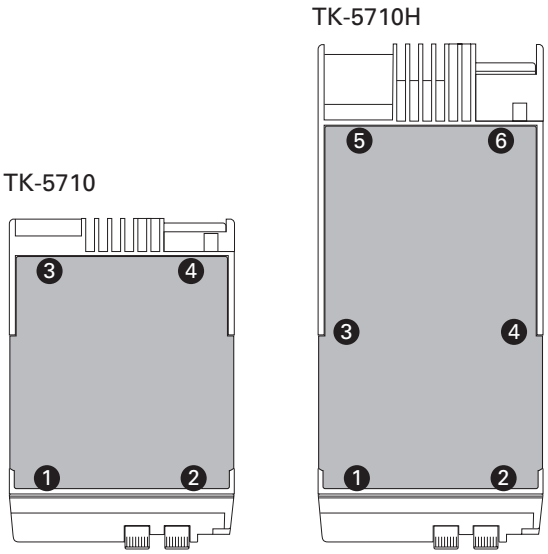
■ Sequence of tightening the screws for the upper / lower case to the chassis

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

• Upper case



• Lower case



CIRCUIT DESCRIPTION

1. Overview

This transceiver is a VHF/FM/APCO portable transceiver designed to operate in the frequency range of 136 to 174MHz.

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.

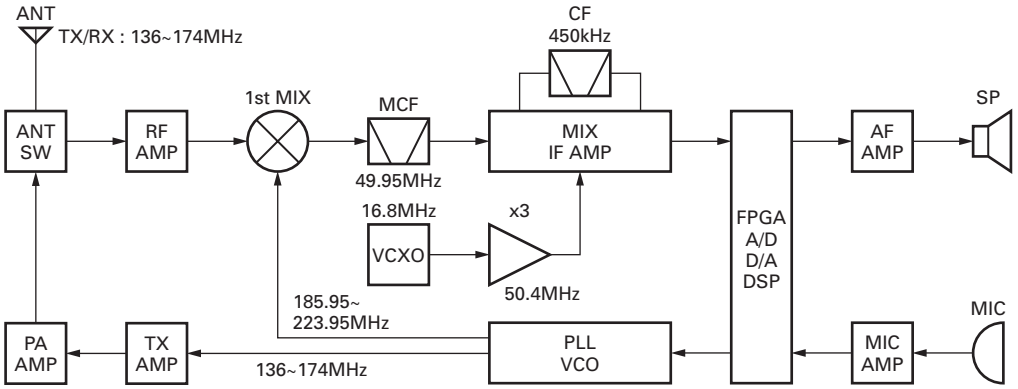


Fig. 1 Frequency configuration

3. Receiver System

3-1. Front-end RF Amplifier

The receive signal from the RX terminal (CN200) of the TX-RX unit (X57-703) is amplified by a transistor (Q200) and passes through the band-pass filter (L221, L222, L223) 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 (D200, D201, D202).

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 (A400).

The receive signal passing through the band-pass filter (L221, L222, L223) and the 1st local signal generated by the VCO, are mixed by the 1st mixer (A400) to produce a 1st IF signal (49.95 MHz) (Upper heterodyne).

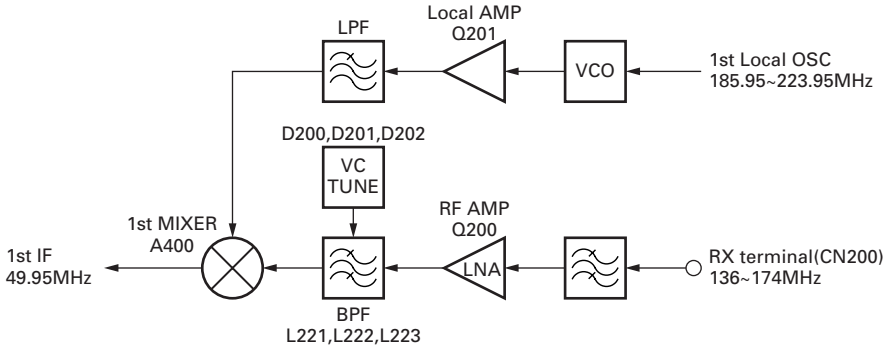


Fig. 2 Front-end RF amplifier and 1st local

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: XF200, Narrow band: XF201), and these are controlled with the IF filter switch (D205, D206, D207, D208, D209, D210, D211 and D212).

The signal passes through the MCF (XF200) when the Wide band (D206, D208, D210 and D212 are ON) is selected. The signal passes through the MCF (XF201) when the Narrow band (D205, D207, D209 and D211 are ON) is selected.

The 1st IF signal passing through these MCFs is amplified by the IF amplifier (Q203) and goes into the FM IC (IC212).

3-4. 2nd Local

The 1st IF signal (49.95 MHz) amplified by the IF amplifier (Q203) and the 2nd local signal (50.4 MHz) generated by tripling the reference oscillator frequency (16.8 MHz) of the VCXO (X200) by Q205, are mixed in the FM IC (IC212) to produce a 2nd IF signal (450 kHz) (Upper heterodyne).

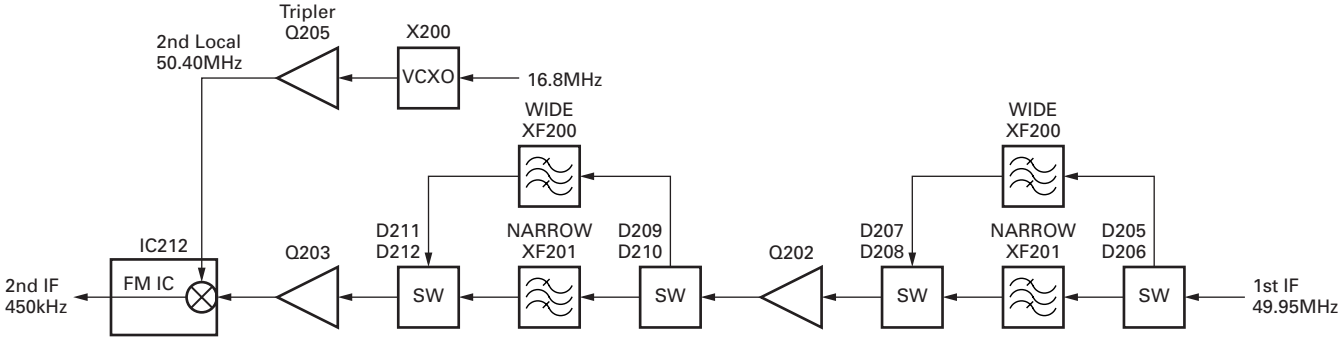


Fig. 3 1st IF and 2nd Local

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 CF204, Narrow band: CF200 and CF203, APCO band: CF201 and CF202), and these are controlled with the multiplexers (IC205, IC206, IC207, IC209, IC210 and IC211).

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

The signal passes through the ceramic filters (CF201 and CF204) 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 CF203) when the Narrow band (W/N1: low level, W/N2: low level, VN: high level) is selected. The signal passes through the ceramic filters (CF201 and CF202) when the APCO band (W/N1: high level, W/N2: low level, VN: low level) is selected.

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

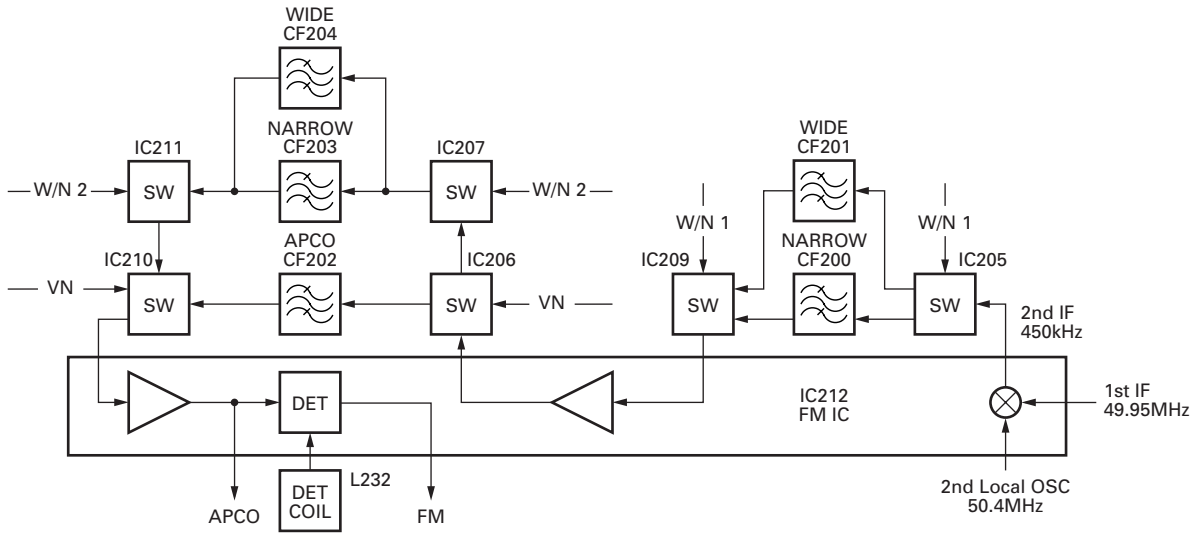


Fig. 4 2nd IF

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).

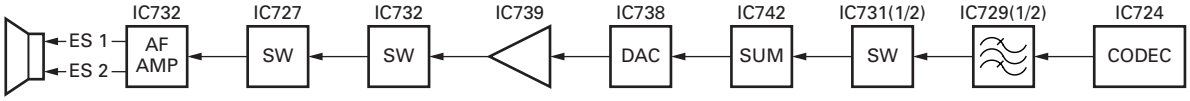


Fig. 5 Audio amplifier circuit

3-7. Squelch Circuit

A noise component is output from the FM IC (IC212). The desired noise signal is extracted by the band-pass filter, and is amplified by the noise amplifier (Q208).

The output signal from the noise amplifier is rectified by D203 to produce a DC voltage, which is output from D203 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.

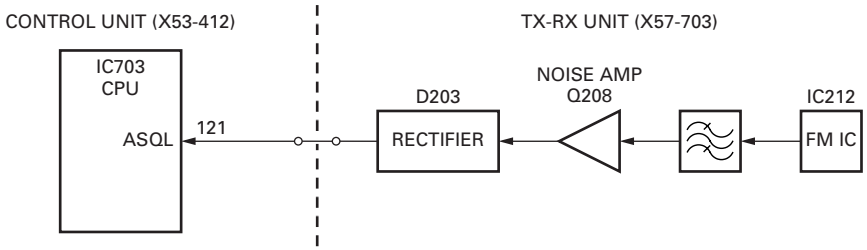


Fig. 6 Squelch circuit

4. Transmitter System

4-1. 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.

4-2. 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)
- 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.

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 APCO 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, Q414, Q416) 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 APCO.

CIRCUIT DESCRIPTION

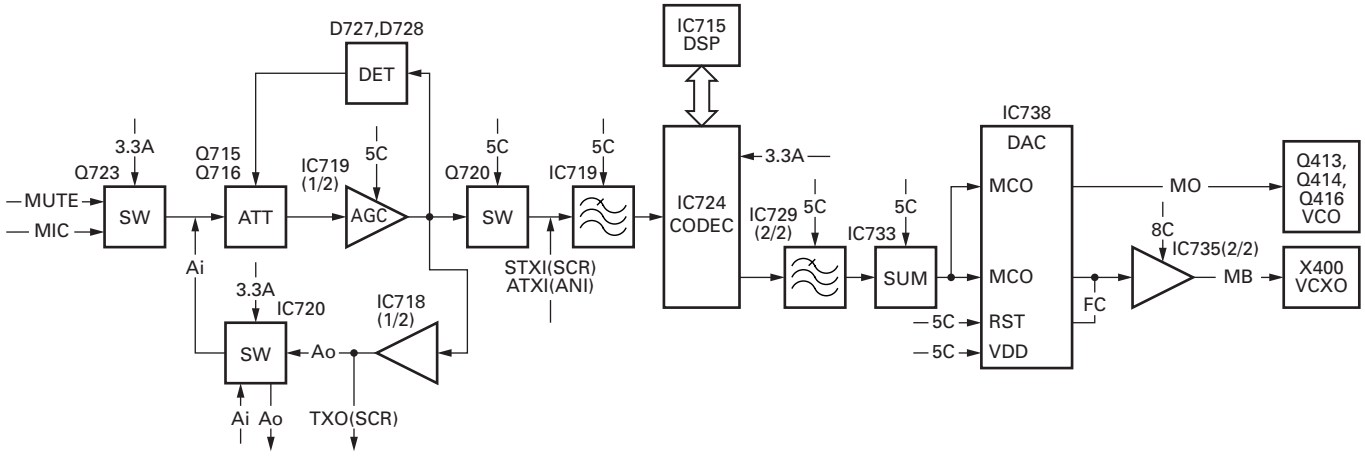


Fig. 7 Audio band and Base band circuit

4-3. Drive Amplifier Circuit (From T/R switch to Power module)

The transmit signal passing through the T/R switch (D435) 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 .

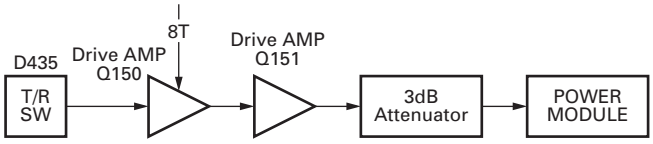


Fig. 8 Drive amplifier circuit

4-4. Final Amplifier Circuit (From Power module to Antenna output): TK-5710 (B)

The transmit signal from the TX terminal (CN1) of the final unit (X45-375) is amplified by the power module (IC2).

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

CM coupler is a line for detecting forward wave and reflected wave.

Forward wave 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 wave 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.

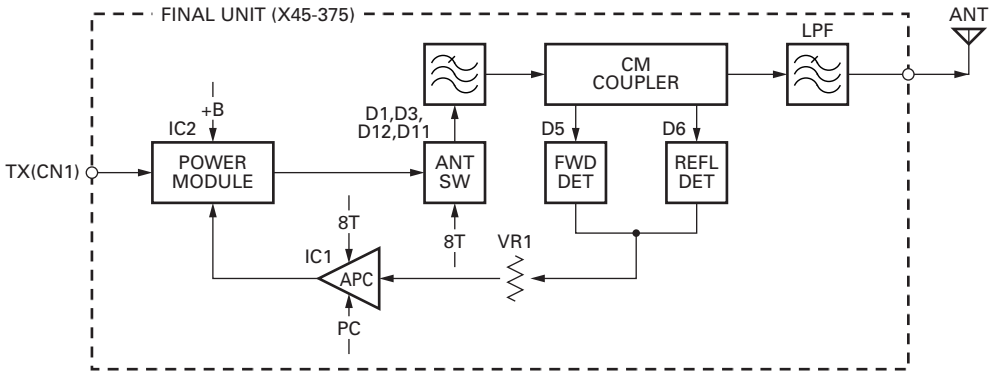


Fig. 9 Final amplifier circuit: TK-5710 (B)

CIRCUIT DESCRIPTION

4-5. Final Amplifier Circuit (From Power module to Antenna output): TK-5710H (B)

The transmit signal from the TX terminal (CN1) of the final unit (X45-376) is amplified by the power module (IC1).

The signal amplified by the power module is divided into two signal, and further is amplified by the final amplifier (Q1,Q2). The each signal from Q1 and Q2 is combined.

The combined signal passes through the antenna switch (D6, D8, D9), CM coupler and low-pass filter, then it is fed to the antenna.

CM coupler is a line for detecting forward wave and reflected wave.

Forward wave is detected by D3, and is converted into DC voltage. The converted DC voltage is fed to the APC comparator (IC2), and is compared with the PC voltage, then is output from the OUT-B terminal (pin 7) of IC2 as an APC voltage. The APC voltage controls the gate voltage of the power module (IC1) and final amplifier (Q1,Q2), and keeps transmission output stable.

If an abnormal antenna load is connected, reflected wave is detected by D4, and output voltage (DC voltage) is fed to the APC comparator (IC2). The transmission output is reduced more as this DC voltage rises.

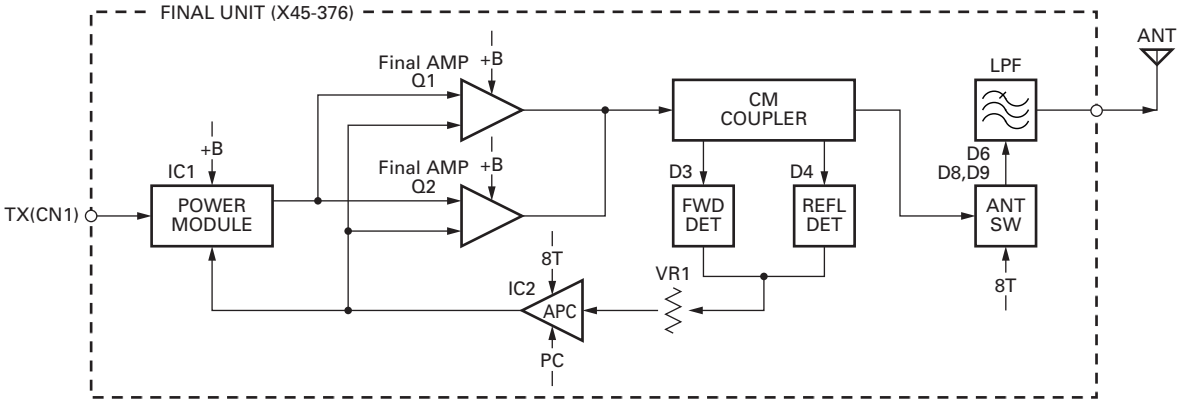


Fig. 10 Final amplifier circuit: TK-5710H (B)

4-6. Temperature Protection Circuit : TK-5710 (B)

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) and controls reference voltage to the APC circuit.

4-7. Temperature Protection Circuit : TK-5710H (B)

To prevent thermal destruction of the power module (IC1) and final amplifier (Q1,Q2), this circuit reduces APC voltage when temperature of the power module (IC1) and final amplifier (Q1,Q2) rises.

The CPU (IC703) detects temperature with the thermistor (TH1,TH2) 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,Q416)
- Rheostat IC (IC401)
- PLL IC (IC400)
- Local switch (D435, D436)

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 (Q413) and RX VCO 2 (Q414) generate a 1st local receive signal. The RX VCO 1 oscillation frequency is 185.95 to 204.9475 MHz and the RX VCO 2 oscillation frequency is 204.95 to 223.95 MHz.

The TX VCO (Q416) generates a transmit carrier. The TX VCO oscillation frequency is 136 to 174 MHz.

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 rheostat 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.

5-3. Rheostat IC (IC401)

The rheostat 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 rheostat IC is controlled by the CPU (IC703) through the 3-line "PCS", "DAT", "CLK" serial bus.

5-4. 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 rheostat 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.

5-5. Local Switch (D435, D436)

The connection destination of the signal output from the amplifier (Q419) is changed with the diode switch (D435) that is controlled by the transmission power supply, 8T, and the diode switch (D436) that is controlled by the receive power supply, 8R.

If the 8T logic is high, it is connected to a transmit-side pre-pre-drive amplifier (Q150). If the 8R logic is high, it passes through the local amplifier (Q210) and then is connected to a receive-side mixer (A400).

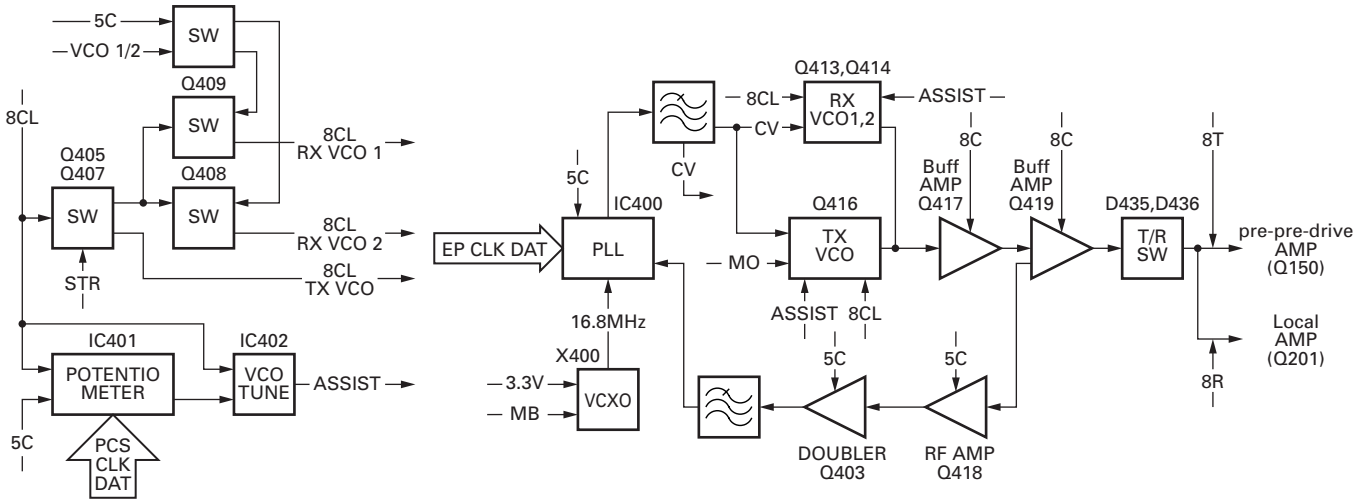


Fig. 11 PLL block diagram

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

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

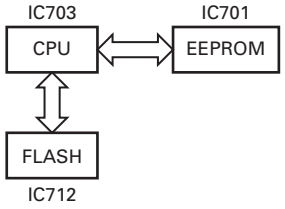


Fig. 12 Memory circuit

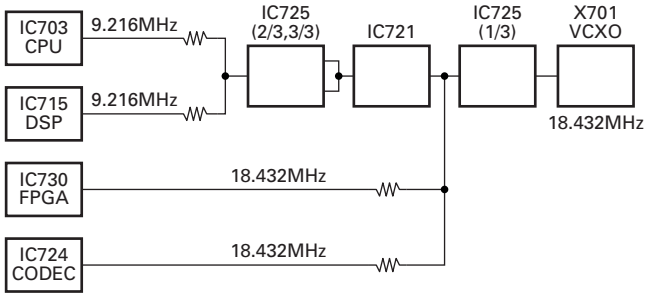


Fig. 13 Clock diagram

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 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).

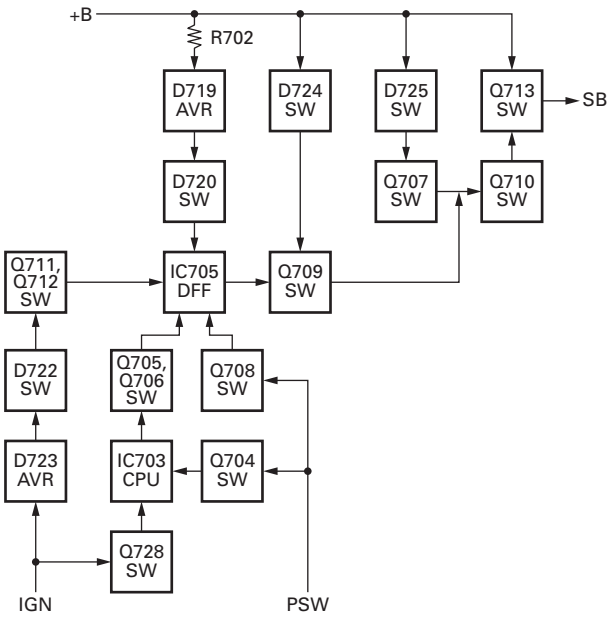


Fig. 14 Power supply circuit

CIRCUIT DESCRIPTION

8. Signaling Circuit

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

Each signaling data signal of QT, DQT, DTMF 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 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:30625MGP213GP (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)
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:Igniton off)
101	DRST	O	DSP reset output (L:Reset)
102	FRST	O	Flash memory reset output (L:Reset)
103	DSPINT	O	DSP interrupt output (L:Interrupt)
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	NC	I/O	NC (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

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 (APCO 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 (TX-RX 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)
Q700	Transistor	Buffer (AUXO1)
Q701	Transistor	Buffer (AUXO2)
Q702	Transistor	Buffer (TXD2)
Q703	Transistor	Buffer (TXD2)
Q704	FET	DC switch (PSW)
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)
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
D743,744	Diode	Voltage protection

COMPONENTS DESCRIPTION

TX-RX unit (X57-7030-10)

Ref. No.	Part name	Description
IC204	IC	OP AMP
IC205~207	IC	Multiplexer
IC209~211	IC	Multiplexer
IC212	IC	FM IC
IC213	IC	Buffer
IC214	IC	Multiplexer
IC400	IC	PLL IC
IC401	IC	Rheostat
IC402	IC	OP AMP
IC600	IC	Shift register
IC601	IC	Voltage regulator
Q150,151	Transistor	RF AMP
Q200	Transistor	RF AMP
Q201	Transistor	Local AMP
Q202,203	Transistor	IF AMP
Q205	Transistor	VCXO frequency AMP
Q206	Transistor	DC switch
Q207	FET	DC switch
Q208	Transistor	Noise AMP
Q209	Transistor	DC switch
Q212,213	Transistor	DC switch
Q400	FET	Buffer
Q401,402	Transistor	DC switch
Q403	Transistor	PLL fin AMP
Q404	Transistor	VCO1/2 switch
Q405	Transistor	VCO TX/RX switch
Q406	FET	VCO1/2 switch
Q407	FET	VCO TX/RX switch
Q408,409	Transistor	RX VCO 1/2 switch
Q412	Transistor	Ripple filter
Q413,414,416	Transistor	VCO oscillation
Q417	Transistor	Buffer AMP
Q418	Transistor	PLL fin AMP
Q419	Transistor	Buffer AMP
Q598,599	Transistor	Lock detection
Q600,601	Transistor	8T switch
Q602,603	Transistor	8R switch
D200~202	Variable capacitance diode	BPF control
D203	Diode	Noise detection
D204	Diode	Reverse current prevention
D205~212	Diode	IF filter switch
D400~403	Diode	PLL fin filter switch
D404	Diode	Bypass diode
D405~407	Variable capacitance diode	Frequency control
D414~416	Variable capacitance diode	Frequency control
D420,422,424	Variable capacitance diode	Frequency control
D427~432	Variable capacitance diode	Frequency control
D433	Variable capacitance diode	Modulator
D435,436	Diode	Local switch
A400	DBM	Double balanced mixer

Final unit (X45-3750-10) : TK-5710 (B)

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
D8	Diode	Surge absorption
D9	Diode	Protect of reverse connection
D10	Diode	Combiner
D11,12	Diode	ANT switch

Final unit (X45-3760-10) : TK-5710H (B)

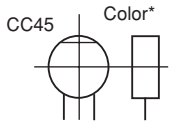
Ref. No.	Part name	Description
IC1	IC	TX drive AMP
IC2	IC	DC AMP and APC comparator
Q1,2	FET	Final AMP
D1	Zener diode	Protect of voltage
D3	Diode	Forward wave rectification
D4	Diode	Reflected wave rectification
D6,8,9	Diode	ANT switch
D10	Diode	Surge absorption
D11	Diode	Protect of reverse connection
D12	Diode	Combiner

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

2 2 0 = 22pF
Multiplier
2nd number
1st number

· Temperature coefficient

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

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

Example : CC45TH = -470 ± 60ppm/℃

· 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)

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

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

Dimension (Chip 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)

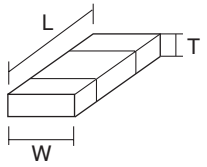
(EX) R K 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
(Chip)(B,F)

· Carbon resistor (Nomal 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-5710(B)/5710H(B)

PARTS LIST

∗ New Parts. ⚠ indicates safety critical components.
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

L: Scandinavia **K**: USA **P**: Canada
Y: PX (Far East, Hawaii) **T**: England **E**: Europe
Y: AAFES (Europe) **X**: Australia **M**: Other Areas

TK-5710(B) (Y51-5040-10)
TK-5710H(B) (Y51-5050-10)
FINAL UNIT (X45-3750-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
TK-5710(B)					
1	3A		A01-2161-22	METALLIC CABINET(TOP)	
2	1B		A01-2162-22	METALLIC CABINET(BOTTOM)	
6	2A		A10-1388-41	CHASSIS	
10	2E	∗	B62-1816-10	INSTRUCTION MANUAL	
14	2B		E04-0167-05	RF COAXIAL RECEPTACLE(M)	
15	1A		E37-0179-05	LEAD WIRE WITH MINIPIN PLUG(X45-X57)	
16	1E		E37-0733-05	SHORT PLUG(SP) ACCESSORY	
17	2B		E37-0772-25	LEAD WIRE WITH CONNECTOR(D-SUB)	
18	1A,3A	∗	E37-1147-05	FLAT CABLE(X53:CN782-X57:CN600)	
19	1A	∗	E37-1149-05	LEAD WIRE WITH CONNECTOR(DC2P/ACC9P)	
21	1A	∗	E37-1153-05	FLAT CABLE(X45:CN9-X57:CN601)	
25	2B		F10-1479-03	SHIELDING PLATE(FINAL:X45)	
27	1A		F10-2265-13	SHIELDING COVER(VCO, TX-RX:X57)	
28	3B	∗	F10-3012-04	SHIELDING PLATE(CONTROL:X53)	
33	3A		G02-0599-04	FLAT SPRING(AVR)	
34	3A		G02-0709-04	FLAT SPRING(AUDIO AMP)	
37	2A,2B	∗	G11-4378-04	SHEET	
38	2A,2B,1E	∗	G11-4379-04	SHEET	
39	2A	∗	G11-4381-04	SHEET	
41	2A		G53-1626-03	PACKING(D-SUB CAP)	
42	2B	∗	G53-1657-04	PACKING(ANT)	
43	2B	∗	G53-1658-04	PACKING(DC/ACC)	
45	3A	∗	G53-1665-12	PACKING(TOP)	
46	1B	∗	G53-1666-12	PACKING(BOTTOM)	
49	2B	∗	G53-1687-04	PACKING(D-SUB)	
50	1E	∗	H02-0626-04	INNER CARTON CASE	
51	2E	∗	H12-3176-02	PACKING FIXTURE(HEAD-SPACE)	
52	2E,3E	∗	H12-3183-02	PACKING FIXTURE(TOP,BOTTOM)	
57	3E	∗	H52-2073-02	ITEM CARTON CASE	
62	1B,3A	∗	J39-0651-05	SPACER(TOP,BOTTOM CABINET)	
A	2B		N09-2292-05	HEXAGON HEAD SCREW(D-SUB)	
B	1B,3A		N32-3008-45	FLAT HEAD MACHINE SCREW(CABINET)	
D	1A		N35-3006-46	BINDING HEAD MACHINE SCREW(DC TERMINAL)	
E	1A		N67-3008-46	PAN HEAD SEMS SCREW(POWER MODULE)	
H	1A,2A,2B,3B		N87-2606-46	BRAZIER HEAD TAPTITE SCREW(PCB)	
I	1A		N87-2612-46	BRAZIER HEAD TAPTITE SCREW(SHIELD)	
J	1B,2B		N87-3008-46	BRAZIER HEAD TAPTITE SCREW(DC/ACC,ANT)	
63	1E		N99-0365-05	SCREW SET ACCESSORY	
65	3B		W09-0971-05	LITHIUM CELL(X53)	
TK-5710H(B)					
3	3C		A01-2163-21	METALLIC CABINET(TOP)	
4	1D		A01-2164-21	METALLIC CABINET(BOTTOM)	
7	2C	∗	A10-4092-12	CHASSIS	
10	2G	∗	B62-1816-10	INSTRUCTION MANUAL	
14	2D		E04-0167-05	RF COAXIAL RECEPTACLE(M)	
15	1C,2C		E37-0179-05	LEAD WIRE WITH MINIPIN PLUG(X45-X57)	
16	1G		E37-0733-05	SHORT PLUG(SP) ACCESSORY	
17	2D		E37-0773-35	LEAD WIRE WITH CONNECTOR(D-SUB)	
18	2C,3C	∗	E37-1147-05	FLAT CABLE(X53:CN782-X57:CN600)	
20	2D	∗	E37-1150-05	LEAD WIRE WITH CONNECTOR(DC4P/ACC9P)	
22	2C	∗	E37-1156-05	FLAT CABLE(X45:CN9-X57:CN601)	
26	1D		F10-1488-02	SHIELDING PLATE(FINAL:X45)	
27	1C		F10-2265-13	SHIELDING COVER(VCO, TX-RX:X57)	
28	3C	∗	F10-3012-04	SHIELDING PLATE(CONTROL:X53)	
29	1C	∗	F10-3015-04	SHIELDING PLATE(X45 LPF)	
30	1C	∗	F10-3016-04	SHIELDING PLATE(X45 POWER MODULE)	
31	1C	∗	F10-3039-04	SHIELDING PLATE(X45 DC)	
32	2C	∗	F10-3040-04	SHIELDING PLATE(X45 ACC)	
33	3C		G02-0599-04	FLAT SPRING(AVR)	
34	3C		G02-0709-04	FLAT SPRING(AUDIO AMP)	
-	-		G02-0729-14	FLAT SPRING	
36	1C		G02-0894-04	EARTH SPRING(FINAL AMP)	
38	2C	∗	G11-4379-04	SHEET	
39	2C	∗	G11-4381-04	SHEET	
41	2D		G53-1626-03	PACKING(D-SUB CAP)	
42	2D	∗	G53-1657-04	PACKING(ANT)	
44	2D	∗	G53-1659-04	PACKING(DC/ACC)	
47	3C	∗	G53-1667-11	PACKING(TOP)	
48	1D	∗	G53-1668-11	PACKING(BOTTOM)	
49	2D	∗	G53-1687-04	PACKING(D-SUB)	
50	1G	∗	H02-0626-04	INNER CARTON CASE	
51	2G	∗	H12-3176-02	PACKING FIXTURE(HEAD-SPACE)	
53	2G.3G	∗	H12-3185-02	PACKING FIXTURE(TOP,BOTTOM)	
58	3G	∗	H52-2074-02	ITEM CARTON CASE	
61	2D	∗	J32-0722-04	HEXAGON BOSS(X45 FET)	
62	1D,3C,3D	∗	J39-0651-05	SPACER(TOP,BOTTOM CABINET)	
A	2D		N09-2292-05	HEXAGON HEAD SCREW(D-SUB)	
B	1D,3C		N32-3008-45	FLAT HEAD MACHINE SCREW(CABINET)	
C	1C	∗	N35-2604-43	BINDING HEAD MACHINE SCREW(HEXAGON)	
E	1C		N67-3008-46	PAN HEAD SEMS SCREW(POWER MODULE)	
F	1C		N68-3008-46	PAN HEAD SEMS SCREW(FINAL AMP)	
G	2D		N68-4006-46	PAN HEAD SEMS SCREW(DC TERMINAL)	
H	1C,2C,3C		N87-2606-46	BRAZIER HEAD TAPTITE SCREW(PCB)	
I	1C		N87-2612-46	BRAZIER HEAD TAPTITE SCREW(SHIELD)	
J	2D		N87-3008-46	BRAZIER HEAD TAPTITE SCREW(DC/ACC,ANT)	
63	1G		N99-0365-05	SCREW SET ACCESSORY	
65	3C		W09-0971-05	LITHIUM CELL(X53)	
FINAL UNIT (X45-3750-10):TK-5710(B)					
C4 -6			CK73FB1H102K	CHIP C 1000PF K	
C8		∗	C90-5299-05	ALUMINIUM ELECTRO 470UF 25WV	
C9			C93-0560-05	CHIP C 10PF D	
C10			CM73F2H180J	CHIP C 18PF J	
C11			CC73GCH1H471J	CHIP C 470PF J	
C12			CK73FB1H102K	CHIP C 1000PF K	
C13			CK73GB1H102K	CHIP C 1000PF K	
C14			C93-0562-05	CHIP C 15PF J	
C15			CK73FB1H102K	CHIP C 1000PF K	
C16			CK73GB1H102K	CHIP C 1000PF K	
C17			CC73FCH1H220J	CHIP C 22PF J	
C19			CK73GB1E333J	CHIP C 0.033UF J	
C20			CM73F2H470J	CHIP C 47PF J	
C21			CK73GB1H102K	CHIP C 1000PF K	

PARTS LIST

FINAL UNIT (X45-3750-10)
FINAL UNIT (X45-3760-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
C22			C93-0562-05	CHIP C 15PF J	
C23			C93-0563-05	CHIP C 18PF J	
C24			C93-0564-05	CHIP C 22PF J	
C25			CK73FB1H102K	CHIP C 1000PF K	
C27			CC73FCH1H330J	CHIP C 33PF J	
C31			CK73FB1H102K	CHIP C 1000PF K	
C34			CK73GB1H102K	CHIP C 1000PF K	
C40 ,41			CK73FB1H102K	CHIP C 1000PF K	
C42			C93-0565-05	CHIP C 27PF J	
C46			C93-0564-05	CHIP C 22PF J	
C47 ,48			CK73FB1H102K	CHIP C 1000PF K	
C49 ,50		*	C90-5299-05	ALUMINIUM ELECTRO 470UF 25WV	
C52 ,53			CK73FB1H102K	CHIP C 1000PF K	
C54			CK73GB1H102K	CHIP C 1000PF K	
C55			C93-0563-05	CHIP C 18PF J	
C56			CC73GCH1H821J	CHIP C 820PF J	
CN1 ,2			E04-0154-05	PIN SOCKET	
CN7			E23-0902-05	TERMINAL	
CN9		*	E40-6429-05	FLAT CABLE CONNECTOR	
CN10			E23-1118-05	TERMINAL	
W2			E37-0705-05	LEAD WIRE WITH CONNECTOR	
L1			L34-4520-05	AIR-CORE COIL	
L2			L34-4523-05	AIR-CORE COIL	
L3 -5			L34-4520-05	AIR-CORE COIL	
L7			L34-4523-05	AIR-CORE COIL	
L8			L34-4520-05	AIR-CORE COIL	
R1			RK73FB2A821J	CHIP R 820 J 1/10W	
R2 ,3			RK73FB2A100J	CHIP R 10 J 1/10W	
R4			RK73FB2A821J	CHIP R 820 J 1/10W	
R5			RK73GB1J103J	CHIP R 10K J 1/16W	
R6			R92-0670-05	CHIP R 0 OHM	
R7			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R9			R92-1288-05	CHIP R 56 J 1W	
R11			RK73GB1J104J	CHIP R 100K J 1/16W	
R12			RK73GB1J101J	CHIP R 100 J 1/16W	
R13			RK73GB1J273J	CHIP R 27K J 1/16W	
R14			RK73GB1J334J	CHIP R 330K J 1/16W	
R15			RK73GB1J682J	CHIP R 6.8K J 1/16W	
R16			RK73GB1J334J	CHIP R 330K J 1/16W	
R17			RK73GB1J104J	CHIP R 100K J 1/16W	
R18			R92-0670-05	CHIP R 0 OHM	
R19			RK73FB2A820J	CHIP R 82 J 1/10W	
R22			RK73GB1J104J	CHIP R 100K J 1/16W	
R23			RK73FB2A820J	CHIP R 82 J 1/10W	
R27			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R28			RK73FB2A122J	CHIP R 1.2K J 1/10W	
R29			R92-1252-05	CHIP R 0 OHM J 1/16W	
R30			RK73FB2A473J	CHIP R 47K J 1/10W	
R32			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R33			R92-1252-05	CHIP R 0 OHM J 1/16W	
R34			RK73GB1J104J	CHIP R 100K J 1/16W	
VR1			R12-6427-05	TRIMMING POT.(47K)	
D1			MA4PH633	DIODE	
D2			02DZ6.2(Y)	ZENER DIODE	
D3			MA4PH633	DIODE	
D5 ,6			HSM88AS	DIODE	
D8			22ZR-10D	SURGE ABSORBER	
D9			DSA3A1-FK	DIODE	
D10			1SS388	DIODE	
D11 ,12			MA4PH633	DIODE	

Ref. No.	Address	New parts	Parts No.	Description	Destination
IC1			TA75W01FU	MOS-IC	
IC2		*	RA60H1317M1-23	MOS-IC(POWER MODULE)	
TH1			S1R104J475H	THERMISTOR	

FINAL UNIT (X45-3760-10) : TK-5710H(B)

C1			CC73FCH1H050C	CHIP C 5.0PF C	
C2			CK73GB1H102K	CHIP C 1000PF K	
C6			CK73FB1H102K	CHIP C 1000PF K	
C8			CK73GB1H102K	CHIP C 1000PF K	
C9			CK73FB1H102K	CHIP C 1000PF K	
C11		*	C90-4126-05	ALUMINIUM ELECTRO 680UF 25WV	
C14			C93-0564-05	CHIP C 22PF J	
C15			C93-0563-05	CHIP C 18PF J	
C16 ,17			C93-0603-05	CHIP C 1000PF K	
C18			CK73GB1H102K	CHIP C 1000PF K	
C20			C93-0559-05	CHIP C 9.0PF D	
C21 ,22			C93-0568-05	CHIP C 47PF J	
C23			CK73GB1C104K	CHIP C 0.10UF K	
C24			CK73GB1H102K	CHIP C 1000PF K	
C25 ,26			C93-0603-05	CHIP C 1000PF K	
C29 -32			C93-0573-05	CHIP C 120PF J	
C33			CK73GB1H102K	CHIP C 1000PF K	
C34 ,35			C93-0573-05	CHIP C 120PF J	
C40 ,41			CC73FCH1H471J	CHIP C 470PF J	
C42 ,43		*	C93-0868-05	MICA CAPACITOR 240PF 300WV	
C44 ,45			CK73FB1H103K	CHIP C 0.010UF K	
C46 ,47			CM73F2H101J	CHIP C 100PF J	
C48 ,49			CK73FB1E104K	CHIP C 0.10UF K	
C50 ,51		*	C90-4126-05	ALUMINIUM ELECTRO 680UF 25WV	
C53 ,54			CM73F2H300J	CHIP C 30PF J	
C56			C93-0571-05	CHIP C 82PF J	
C57			C93-0603-05	CHIP C 1000PF K	
C58			CM73F2H090D	CHIP C 9.0PF D	
C59			C93-0571-05	CHIP C 82PF J	
C62			CM73F2H180J	CHIP C 18PF J	
C63			CM73F2H181J	CHIP C 180PF J	
C64			CC73FCH1H220J	CHIP C 22PF J	
C65			CK73FB1H102K	CHIP C 1000PF K	
C67			CK73FB1H102K	CHIP C 1000PF K	
C70			CM73F2H181J	CHIP C 180PF J	
C71			CK73FB1H102K	CHIP C 1000PF K	
C72			C93-0603-05	CHIP C 1000PF K	
C73			CK73FB1H102K	CHIP C 1000PF K	
C74			CM73F2H060D	CHIP C 6.0PF D	
C75			CM73F2H100D	CHIP C 10PF D	
C76			CK73FB1H102K	CHIP C 1000PF K	
C77			CM73F2H101J	CHIP C 100PF J	
C78		*	CM73F2H270F	CHIP C 27PF F	
C79			CC73FCH1H090D	CHIP C 9.0PF D	
C80			C92-0777-05	ELECTRO 1000UF 25WV	
C81		*	CM73F2H270F	CHIP C 27PF F	
C82			C93-0603-05	CHIP C 1000PF K	
C83		*	CM73F2H270F	CHIP C 27PF F	
C84			CK73FB1H102K	CHIP C 1000PF K	
C85		*	CM73F2H220C	CHIP C 22PF C	
C86			CK73FB1H102K	CHIP C 1000PF K	
C87 ,88			CK73GB1H102K	CHIP C 1000PF K	
C89			CK73FB1H102K	CHIP C 1000PF K	
C90			CC73FCH1H050C	CHIP C 5.0PF C	

PARTS LIST

FINAL UNIT (X45-3760-10)
CONTROL UNIT (X53-4120-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
C91			CK73FB1H102K	CHIP C 1000PF K	
C93		*	CM73F2H240C	CHIP C 24PF C	
C97		*	CM73F2H220C	CHIP C 22PF C	
C98			CC73FCH1H101J	CHIP C 100PF J	
CN1 ,2			E04-0154-05	PIN SOCKET	
CN3 ,4			E23-1116-05	RELAY TERMINAL	
CN9		*	E40-6429-05	FLAT CABLE CONNECTOR	
CN10			E23-1118-05	TERMINAL	
W2		*	E37-1218-05	LEAD WIRE WITH CONNECTOR	
L1		*	L41-4778-08	SMALL FIXED INDUCTOR(47NH)	
L2 ,3			L34-4520-05	AIR-CORE COIL	
L4 ,5			L34-4556-05	AIR-CORE COIL	
L6 ,7			L34-4520-05	AIR-CORE COIL	
L8 ,9			L34-4517-05	AIR-CORE COIL	
L10 ,11			L34-4520-05	AIR-CORE COIL	
L13			L34-4523-05	AIR-CORE COIL	
L14 -17		*	L34-4805-05	AIR-CORE COIL	
L18 -22			L92-0179-05	CHIP FERRITE	
R5			R92-0670-05	CHIP R 0 OHM	
R6			RK73GB1J103J	CHIP R 10K J 1/16W	
R7			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R8 ,9			R92-1252-05	CHIP R 0 OHM J 1/16W	
R10			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R11			RK73GB1J103J	CHIP R 10K J 1/16W	
R12			R92-1252-05	CHIP R 0 OHM J 1/16W	
R13			RK73GB1J101J	CHIP R 100 J 1/16W	
R14			RK73GB1J274J	CHIP R 270K J 1/16W	
R15			RK73GB1J334J	CHIP R 330K J 1/16W	
R16			RK73GB1J473J	CHIP R 47K J 1/16W	
R17 ,18			R92-1264-05	CHIP R 5.6 J 1W	
R20			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R21			R92-1252-05	CHIP R 0 OHM J 1/16W	
R23 ,24			RK73GB1J104J	CHIP R 100K J 1/16W	
R25			R92-1221-05	CHIP R 82 J 1/4W	
R26			RK73FB2A101J	CHIP R 100 J 1/10W	
R27			R92-1204-05	CHIP R 100 J 1/4W	
R28			R92-1319-05	CHIP R 82 J 1W	
R29			RK73FB2A224J	CHIP R 220K J 1/10W	
R31			R92-0670-05	CHIP R 0 OHM	
R33			R92-1252-05	CHIP R 0 OHM J 1/16W	
R36			RK73FB2A221J	CHIP R 220 J 1/10W	
R37			RK73FB2A820J	CHIP R 82 J 1/10W	
R38			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R39			RK73FB2A563J	CHIP R 56K J 1/10W	
R40			R92-0670-05	CHIP R 0 OHM	
R41 ,42			R92-1279-05	CHIP R 33 J 1W	
R43 ,44			R92-2673-05	CHIP R 1.0 J 1W	
R46 -48			R92-2673-05	CHIP R 1.0 J 1W	
R49 -51			R92-1279-05	CHIP R 33 J 1W	
R53			R92-1279-05	CHIP R 33 J 1W	
R54			R92-0670-05	CHIP R 0 OHM	
R56 ,57			RK73FB2A103J	CHIP R 10K J 1/10W	
R58			RK73GB1J102J	CHIP R 1.0K J 1/16W	
VR1			R12-6431-05	TRIMMING POT.(220K)	
D1			02DZ5.6(X,Y)	ZENER DIODE	
D3 ,4			HSM88AS	DIODE	
D6		*	MA4P4002F	DIODE	
D8 ,9			MA4PH633	DIODE	
D10			ZSH5MA27	SURGE ABSORBER	
D11		*	DF25V60	DIODE	
D12			MA2S111	DIODE	
IC1		*	RA13H1317M-31	HYBRID IC(POWER MODULE)	
IC2			TA75W01FU	MOS-IC	
Q1 ,2		*	RD100HHF1-02	FET	
TH1			S1R104J475H	THERMISTOR	
TH3			S1R104J475H	THERMISTOR	

CONTROL UNIT (X53-4120-10) : TK-5710(B)/5710H(B)

Ref. No.	Address	New parts	Parts No.	Description	Destination
C601			CK73HB1A104K	CHIP C 0.10UF K	
C603			CK73HB1A104K	CHIP C 0.10UF K	
C605			CK73HB1C103K	CHIP C 0.010UF K	
C608			CK73HB1A104K	CHIP C 0.10UF K	
C610			CK73GB0J105K	CHIP C 1.0UF K	
C611			CC73GCH1H101J	CHIP C 100PF J	
C652,653			CK73GB1E105K	CHIP C 1.0UF K	
C654			CK73GB1C104K	CHIP C 0.10UF K	
C655			CC73GCH1H470J	CHIP C 47PF J	
C656-660			CK73GB1H102K	CHIP C 1000PF K	
C661			CK73GB1C104K	CHIP C 0.10UF K	
C662			CC73GCH1H470J	CHIP C 47PF J	
C663			CK73GB1C104K	CHIP C 0.10UF K	
C664			CK73GB0J475K	CHIP C 4.7UF K	
C665			CK73GB1H103K	CHIP C 0.010UF K	
C700			CK73GB1H102K	CHIP C 1000PF K	
C701			CK73GB1C473K	CHIP C 0.047UF K	
C702			CK73GB1H471K	CHIP C 470PF K	
C703			CC73GCH1H101J	CHIP C 100PF J	
C704			CK73GB1C473K	CHIP C 0.047UF K	
C705			CK73GB1C104K	CHIP C 0.10UF K	
C706			CK73GB1C473K	CHIP C 0.047UF K	
C707			CK73FB1E474K	CHIP C 0.47UF K	
C708			CK73GB1H471K	CHIP C 470PF K	
C710			CK73GB1C473K	CHIP C 0.047UF K	
C711			CK73GB1C104K	CHIP C 0.10UF K	
C712			CK73GB1A105K	CHIP C 1.0UF K	
C713			CK73FB0J106K	CHIP C 10UF K	
C714,715			CK73GB1A105K	CHIP C 1.0UF K	
C716,717			CK73GB1C104K	CHIP C 0.10UF K	
C718-721			CC73GCH1H101J	CHIP C 100PF J	
C722-732			CK73GB1H102K	CHIP C 1000PF K	
C733			CC73GCH1H101J	CHIP C 100PF J	
C734			CK73GB1H102K	CHIP C 1000PF K	
C735			CC73GCH1H101J	CHIP C 100PF J	
C736			CK73GB1H102K	CHIP C 1000PF K	
C737-741			CC73GCH1H101J	CHIP C 100PF J	
C743-745			CC73GCH1H101J	CHIP C 100PF J	
C746-748			CK73GB1C104K	CHIP C 0.10UF K	
C749			CK73GB1H102K	CHIP C 1000PF K	
C751			CK73GB1H472K	CHIP C 4700PF K	
C753			CK73HB1A104K	CHIP C 0.10UF K	
C754			CK73HB1H102K	CHIP C 1000PF K	
C756			CK73HB1A104K	CHIP C 0.10UF K	
C757			C92-0754-05	CHIP C 4.7UF 20WV	
C758			CK73HB1A104K	CHIP C 0.10UF K	
C759,760			CK73GB1H471K	CHIP C 470PF K	
C761			CK73HB1A104K	CHIP C 0.10UF K	
C762			C92-1431-05	CHIP C 33UF 16WV	
C763			C92-0628-05	CHIP-TAN 10UF 10WV	

PARTS LIST

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Ref. No.	Address	New parts	Parts No.	Description	Destination
C764-767			CK73FB0J106K	CHIP C 10UF K	
C768			CK73HB1A104K	CHIP C 0.10UF K	
C769			CC73GCH1H390J	CHIP C 39PF J	
C770			CK73GB1H102K	CHIP C 1000PF K	
C771			C92-0713-05	CHIP-TAN 10UF 6.3WV	
C772,773			CK73HB1C103K	CHIP C 0.010UF K	
C775			CK73HB1C103K	CHIP C 0.010UF K	
C776			C92-0713-05	CHIP-TAN 10UF 6.3WV	
C778			CK73HB1C103K	CHIP C 0.010UF K	
C780,781			CK73HB1C103K	CHIP C 0.010UF K	
C783,784			CK73HB1C103K	CHIP C 0.010UF K	
C785			CK73GB1C104K	CHIP C 0.10UF K	
C786			CK73GB0J105K	CHIP C 1.0UF K	
C787			CC73GCH1H101J	CHIP C 100PF J	
C788			CK73GB1H103K	CHIP C 0.010UF K	
C789,790			C92-0628-05	CHIP-TAN 10UF 10WV	
C791			CC73GCH1H220J	CHIP C 22PF J	
C792			CK73GB1C104K	CHIP C 0.10UF K	
C793,794			C92-0804-05	CHIP-TAN 1.5UF 15WV	
C795			CK73GB1C104K	CHIP C 0.10UF K	
C796			CK73GB1C104K	CHIP C 0.10UF K	
C797			CC73GCH1H101J	CHIP C 100PF J	
C798			CK73GB0J105K	CHIP C 1.0UF K	
C799			C92-0628-05	CHIP-TAN 10UF 10WV	
C800,801			CK73GB1C104K	CHIP C 0.10UF K	
C802,803			CK73GB0J475K	CHIP C 4.7UF K	
C804,805			CK73GB1C104K	CHIP C 0.10UF K	
C808			CK73GB1H103K	CHIP C 0.010UF K	
C809			CK73GB1C104K	CHIP C 0.10UF K	
C810			CK73GB1H471K	CHIP C 470PF K	
C811			CK73GB1C104K	CHIP C 0.10UF K	
C812			CK73GB1H471K	CHIP C 470PF K	
C814			C92-0712-05	CHIP-TAN 22UF 6.3WV	
C815			CK73GB0J105K	CHIP C 1.0UF K	
C818			CK73FB0J106K	CHIP C 10UF K	
C820			CK73FB0J106K	CHIP C 10UF K	
C822			CK73GB1E105K	CHIP C 1.0UF K	
C823,824			CK73GB1C104K	CHIP C 0.10UF K	
C825			CC73GCH1H220J	CHIP C 22PF J	
C826,827			CK73GB1E105K	CHIP C 1.0UF K	
C829			CK73GB1H103K	CHIP C 0.010UF K	
C833			CK73GB1E105K	CHIP C 1.0UF K	
C837			CK73FB0J106K	CHIP C 10UF K	
C838,839			C92-0633-05	CHIP-TAN 22UF 10WV	
C841			C92-0628-05	CHIP-TAN 10UF 10WV	
C844			C92-0633-05	CHIP-TAN 22UF 10WV	
C845			CK73GB1H122K	CHIP C 1200PF K	
C846,847			CK73GB1H103K	CHIP C 0.010UF K	
C848			C92-0633-05	CHIP-TAN 22UF 10WV	
C849			CC73GCH1H101J	CHIP C 100PF J	
C850			CK73GB1C104K	CHIP C 0.10UF K	
C851			CK73GB1H472K	CHIP C 4700PF K	
C852			CK73GB0J475K	CHIP C 4.7UF K	
C853,854			CK73GB1H103K	CHIP C 0.010UF K	
C855			CK73GB0J475K	CHIP C 4.7UF K	
C856			CK73GB1H103K	CHIP C 0.010UF K	
C857			CC73GCH1H121J	CHIP C 120PF J	
C858			CK73GB1H392K	CHIP C 3900PF K	
C859			C92-0719-05	ELECTRO 47UF 25WV	
C860			CK73GB0J475K	CHIP C 4.7UF K	

Ref. No.	Address	New parts	Parts No.	Description	Destination
C862			CC73GCH1H101J	CHIP C 100PF J	
C863			CK73GB1H102K	CHIP C 1000PF K	
C864			C92-0720-05	ELECTRO 100UF 25WV	
C865-867			CK73GB1H103K	CHIP C 0.010UF K	
C868			CK73GB1C104K	CHIP C 0.10UF K	
C869			CK73GB1H103K	CHIP C 0.010UF K	
C871			CK73GB1C104K	CHIP C 0.10UF K	
C872			C92-0719-05	ELECTRO 47UF 25WV	
C874			CK73GB1C104K	CHIP C 0.10UF K	
C875			CK73GB1H103K	CHIP C 0.010UF K	
C878			CK73GB1C104K	CHIP C 0.10UF K	
C879			CK73GB1H103K	CHIP C 0.010UF K	
C880			CK73GB1C104K	CHIP C 0.10UF K	
C881			CK73GB1H103K	CHIP C 0.010UF K	
C889			CK73GB1C104K	CHIP C 0.10UF K	
C890,891			CK73GB1H103K	CHIP C 0.010UF K	
C892-899			CK73GB1H102K	CHIP C 1000PF K	
C900			CC73GCH1H470J	CHIP C 47PF J	
C901,902			CK73GB1C104K	CHIP C 0.10UF K	
C904			CK73GB1H103K	CHIP C 0.010UF K	
C905,906			CK73GB1C104K	CHIP C 0.10UF K	
C907-909			CK73GB1H103K	CHIP C 0.010UF K	
C910,911			C92-0633-05	CHIP-TAN 22UF 10WV	
C912			C92-0585-05	CHIP-TAN 4.7UF 16WV	
C914			CK73GB1C104K	CHIP C 0.10UF K	
C915			CK73GB1C473K	CHIP C 0.047UF K	
C916-919			CC73HCH1H330J	CHIP C 33PF J	
C921,922			CK73GB0J475K	CHIP C 4.7UF K	
C995			C92-0628-05	CHIP-TAN 10UF 10WV	
C996			CK73GB1C104K	CHIP C 0.10UF K	
C997			CK73GB1H471K	CHIP C 470PF K	
C998			CK73GB1C104K	CHIP C 0.10UF K	
C999			CK73GB1H222K	CHIP C 2200PF K	
CN702			E40-5703-05	PIN ASSY	
CN705			E40-6202-05	FLAT CABLE CONNECTOR	
CN709			E40-6050-05	FLAT CABLE CONNECTOR	
CN724			E40-5661-05	SOCKET FOR PIN ASSY	
CN728			E40-5960-05	PIN ASSY	
CN744			E40-6357-05	PIN ASSY	
CN755			E40-6357-05	PIN ASSY	
CN771			E40-6357-05	PIN ASSY	
CN782		*	E40-6438-05	FLAT CABLE CONNECTOR	
CN783			E40-5066-05	PIN ASSY	
W700			E37-0707-05	LEAD WIRE WITH CONNECTOR	
F700			F53-0278-05	FUSE(5.0A)	
F701			F53-0195-05	FUSE(2.5A)	
CN701			J19-5386-05	HOLDER	
L650			L92-0446-05	BEADS CORE	
L700,701			L92-0140-05	CHIP FERRITE	
L704-715			L92-0163-05	BEADS CORE	
L716,717			L92-0162-05	BEADS CORE	
L718			L92-0446-05	BEADS CORE	
L721			L92-0446-05	BEADS CORE	
L722,723			L92-0140-05	CHIP FERRITE	
L724-732			L92-0179-05	CHIP FERRITE	
X700		*	L77-2304-05	CRYSTAL RESONATOR(32768HZ)	
X701			L77-1962-05	VCXO(18.432MHZ)	
CP700-702			R90-0743-05	MULTIPLE RESISTOR(47K*2)	
CP703,704			R90-0745-05	MULTIPLE RESISTOR(470K*2)	
R603			R92-1368-05	CHIP R 0 OHM	

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Ref. No.	Address	New parts	Parts No.	Description	Destination
R604,605			RK73HB1J100J	CHIP R 10 J 1/16W	
R606			R92-1368-05	CHIP R 0 OHM	
R607			RK73HB1J474J	CHIP R 470K J 1/16W	
R608,609			RK73HB1J100J	CHIP R 10 J 1/16W	
R610,611			RK73HB1J474J	CHIP R 470K J 1/16W	
R612			RK73HB1J100J	CHIP R 10 J 1/16W	
R613,614			RK73HB1J470J	CHIP R 47 J 1/16W	
R615			RK73HB1J474J	CHIP R 470K J 1/16W	
R616,617			RK73HB1J100J	CHIP R 10 J 1/16W	
R618			RK73HB1J474J	CHIP R 470K J 1/16W	
R619,620			RK73HB1J470J	CHIP R 47 J 1/16W	
R621			RK73HB1J101J	CHIP R 100 J 1/16W	
R623,624			RK73GB1J220J	CHIP R 22 J 1/16W	
R625			R92-1252-05	CHIP R 0 OHM J 1/16W	
R627			RK73GB1J223J	CHIP R 22K J 1/16W	
R628			RK73GB1J103J	CHIP R 10K J 1/16W	
R629			RK73HB1J100J	CHIP R 10 J 1/16W	
R630			RK73GB1J563J	CHIP R 56K J 1/16W	
R631			RK73GB1J274J	CHIP R 270K J 1/16W	
R632,633			RK73GB1J333J	CHIP R 33K J 1/16W	
R634-636			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R637-640			RK73GB1J333J	CHIP R 33K J 1/16W	
R650			R92-0670-05	CHIP R 0 OHM	
R651			R92-1252-05	CHIP R 0 OHM J 1/16W	
R652			RK73GB1J474J	CHIP R 470K J 1/16W	
R653			RK73GB1J470J	CHIP R 47 J 1/16W	
R654,655			RK73GB1J474J	CHIP R 470K J 1/16W	
R656-658			RK73GB1J470J	CHIP R 47 J 1/16W	
R659			RK73GB1J474J	CHIP R 470K J 1/16W	
R660			RK73GB1J103J	CHIP R 10K J 1/16W	
R661			RK73GB1J333J	CHIP R 33K J 1/16W	
R662			RK73GB1J100J	CHIP R 10 J 1/16W	
R663,664			RK73GB1J333J	CHIP R 33K J 1/16W	
R665			RK73GB1J100J	CHIP R 10 J 1/16W	
R666			RK73GB1J104J	CHIP R 100K J 1/16W	
R667			RK73GB1J684J	CHIP R 680K J 1/16W	
R668			RK73GB1J474J	CHIP R 470K J 1/16W	
R669			RK73GB1J100J	CHIP R 10 J 1/16W	
R670			RK73GB1J333J	CHIP R 33K J 1/16W	
R671			RK73GB1J104J	CHIP R 100K J 1/16W	
R672,673			RK73GB1J100J	CHIP R 10 J 1/16W	
R674			RK73GB1J474J	CHIP R 470K J 1/16W	
R675			RK73GB1J184J	CHIP R 180K J 1/16W	
R676			RK73GB1J333J	CHIP R 33K J 1/16W	
R678			RK73GB1J104J	CHIP R 100K J 1/16W	
R680,681			R92-1368-05	CHIP R 0 OHM	
R682			R92-1252-05	CHIP R 0 OHM J 1/16W	
R685			R92-1252-05	CHIP R 0 OHM J 1/16W	
R686			RK73GB1J223J	CHIP R 22K J 1/16W	
R687			RK73GB1J153J	CHIP R 15K J 1/16W	
R690			R92-0670-05	CHIP R 0 OHM	
R693,694			R92-0670-05	CHIP R 0 OHM	
R697			R92-0670-05	CHIP R 0 OHM	
R701			R92-1252-05	CHIP R 0 OHM J 1/16W	
R702			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R703			RK73GB1J103J	CHIP R 10K J 1/16W	
R704		*	R92-3591-05	METAL-R 1.0K J 1/2W	
R705			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R706,707			RK73GB1J104J	CHIP R 100K J 1/16W	
R708			RK73GB1J103J	CHIP R 10K J 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R709			RK73GB1J104J	CHIP R 100K J 1/16W	
R710			RK73GB1J473J	CHIP R 47K J 1/16W	
R711			RK73GB1J473J	CHIP R 47K J 1/16W	
R712			RK73GB1J473J	CHIP R 47K J 1/16W	
R713			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R714			RK73GB1J473J	CHIP R 47K J 1/16W	
R715			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R716			RK73GB1J473J	CHIP R 47K J 1/16W	
R717			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R718			RK73GB1J473J	CHIP R 47K J 1/16W	
R719			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R720			RK73GB1J473J	CHIP R 47K J 1/16W	
R721			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R722			RK73GB1J473J	CHIP R 47K J 1/16W	
R723			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R724			RK73GB1J473J	CHIP R 47K J 1/16W	
R726			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R728,729			RK73GB1J473J	CHIP R 47K J 1/16W	
R730-734			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R735			R92-1252-05	CHIP R 0 OHM J 1/16W	
R736			RN73GH1J512D	CHIP R 5.1K D 1/16W	
R737			RN73GH1J272D	CHIP R 2.7K D 1/16W	
R738			RK73GB1J103J	CHIP R 10K J 1/16W	
R739			R92-1252-05	CHIP R 0 OHM J 1/16W	
R740			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R741-744			RK73GB1J473J	CHIP R 47K J 1/16W	
R745			RK73HB1J104J	CHIP R 100K J 1/16W	
R746			RK73HB1J473J	CHIP R 47K J 1/16W	
R748			RK73HB1J473J	CHIP R 47K J 1/16W	
R749			RK73HB1J104J	CHIP R 100K J 1/16W	
R750			RK73HB1J104J	CHIP R 100K J 1/16W	
R751			RK73HB1J474J	CHIP R 470K J 1/16W	
R752,753			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R754			RK73HB1J474J	CHIP R 470K J 1/16W	
R755			R92-0670-05	CHIP R 0 OHM	
R756			RK73HB1J473J	CHIP R 47K J 1/16W	
R757			RK73GB1J104J	CHIP R 100K J 1/16W	
R758			R92-1368-05	CHIP R 0 OHM	
R759			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R760			RK73GB1J333J	CHIP R 33K J 1/16W	
R761			RK73GB1J473J	CHIP R 47K J 1/16W	
R762,763			RN73HH1J102D	CHIP R 1.0K D 1/16W	
R764			RK73HH1J393D	CHIP R 39K D 1/16W	
R765			RK73HH1J123D	CHIP R 12K D 1/16W	
R766			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R767			R92-0670-05	CHIP R 0 OHM	
R768			RK73FB2A471J	CHIP R 470 J 1/10W	
R769			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R771			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R772			RK73GB1J104J	CHIP R 100K J 1/16W	
R773			RK73HB1J474J	CHIP R 470K J 1/16W	
R774,775			RK73GB1J473J	CHIP R 47K J 1/16W	
R776			RK73HB1J474J	CHIP R 470K J 1/16W	
R777			RK73GB1J473J	CHIP R 47K J 1/16W	
R778-782			RK73HB1J101J	CHIP R 100 J 1/16W	
R783			RK73HB1J473J	CHIP R 47K J 1/16W	
R784-786			RK73HB1J101J	CHIP R 100 J 1/16W	
R787			RK73HB1J474J	CHIP R 470K J 1/16W	
R788			RK73FB2A473J	CHIP R 47K J 1/10W	
R789			RK73HB1J473J	CHIP R 47K J 1/16W	

PARTS LIST

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Ref. No.	Address	New parts	Parts No.	Description	Destination
R790			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R791-810			RK73HB1J101J	CHIP R 100 J 1/16W	
R811			RK73HB1J474J	CHIP R 470K J 1/16W	
R812			R92-1368-05	CHIP R 0 OHM	
R813			RK73GB1J274J	CHIP R 270K J 1/16W	
R814			RK73HB1J104J	CHIP R 100K J 1/16W	
R815			RK73HB1J473J	CHIP R 47K J 1/16W	
R816			RK73GB1J104J	CHIP R 100K J 1/16W	
R817,818			R92-1368-05	CHIP R 0 OHM	
R819			R92-1252-05	CHIP R 0 OHM J 1/16W	
R820			RK73HB1J104J	CHIP R 100K J 1/16W	
R821			RK73HB1J473J	CHIP R 47K J 1/16W	
R822			R92-1368-05	CHIP R 0 OHM	
R823			RK73HB1J473J	CHIP R 47K J 1/16W	
R824-826			RK73HB1J474J	CHIP R 470K J 1/16W	
R829-834			RK73HB1J473J	CHIP R 47K J 1/16W	
R835			R92-1368-05	CHIP R 0 OHM	
R837			RK73GB1J473J	CHIP R 47K J 1/16W	
R838			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R839			RK73GB1J473J	CHIP R 47K J 1/16W	
R840			RK73GB1J153J	CHIP R 15K J 1/16W	
R841			RK73GB1J103J	CHIP R 10K J 1/16W	
R842			RK73GB1J123J	CHIP R 12K J 1/16W	
R843			RK73GB1J564J	CHIP R 560K J 1/16W	
R844			RK73GB1J474J	CHIP R 470K J 1/16W	
R845			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R846			RK73GB1J682J	CHIP R 6.8K J 1/16W	
R847			RK73GB1J822J	CHIP R 8.2K J 1/16W	
R848			R92-1252-05	CHIP R 0 OHM J 1/16W	
R849			RK73GB1J154J	CHIP R 150K J 1/16W	
R850			RK73GB1J333J	CHIP R 33K J 1/16W	
R854			RK73GB1J123J	CHIP R 12K J 1/16W	
R855			RK73GB1J474J	CHIP R 470K J 1/16W	
R856			RK73GB1J104J	CHIP R 100K J 1/16W	
R858			RK73GB1J224J	CHIP R 220K J 1/16W	
R859			RK73GB1J104J	CHIP R 100K J 1/16W	
R860			R92-1252-05	CHIP R 0 OHM J 1/16W	
R861			RK73GB1J223J	CHIP R 22K J 1/16W	
R862			R92-1252-05	CHIP R 0 OHM J 1/16W	
R863			RK73GB1J333J	CHIP R 33K J 1/16W	
R865			RK73GB1J104J	CHIP R 100K J 1/16W	
R866			RK73GB1J473J	CHIP R 47K J 1/16W	
R867			RK73GB1J333J	CHIP R 33K J 1/16W	
R868			R92-1252-05	CHIP R 0 OHM J 1/16W	
R870			R92-1252-05	CHIP R 0 OHM J 1/16W	
R874			RK73GB1J100J	CHIP R 10 J 1/16W	
R875			RK73GB1J153J	CHIP R 15K J 1/16W	
R876			RK73GB1J154J	CHIP R 150K J 1/16W	
R878			RK73GB1J103J	CHIP R 10K J 1/16W	
R879			RK73GB1J104J	CHIP R 100K J 1/16W	
R882			RK73GB1J4R7J	CHIP R 4.7 J 1/16W	
R883			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R886			RK73GB1J104J	CHIP R 100K J 1/16W	
R890			RK73GB1J684J	CHIP R 680K J 1/16W	
R891			RK73GB1J474J	CHIP R 470K J 1/16W	
R896			RK73GB1J274J	CHIP R 270K J 1/16W	
R897			R92-1252-05	CHIP R 0 OHM J 1/16W	
R899,900			R92-1252-05	CHIP R 0 OHM J 1/16W	
R903			R92-1252-05	CHIP R 0 OHM J 1/16W	
R906			RK73GB1J473J	CHIP R 47K J 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R908			RK73GB1J103J	CHIP R 10K J 1/16W	
R909			RK73GB1J473J	CHIP R 47K J 1/16W	
R910			RK73GB1J103J	CHIP R 10K J 1/16W	
R911			RK73GB1J393J	CHIP R 39K J 1/16W	
R912			RK73GB1J473J	CHIP R 47K J 1/16W	
R913			RK73GB1J184J	CHIP R 180K J 1/16W	
R914			RK73GB1J103J	CHIP R 10K J 1/16W	
R916			RK73GB1J103J	CHIP R 10K J 1/16W	
R917			RK73HB1J103J	CHIP R 10K J 1/16W	
R918,919			R92-1368-05	CHIP R 0 OHM	
R920			RK73GB1J333J	CHIP R 33K J 1/16W	
R922			RK73HB1J104J	CHIP R 100K J 1/16W	
R923,924			RK73GB1J473J	CHIP R 47K J 1/16W	
R926			RN73GH1J473D	CHIP R 47K D 1/16W	
R928			RK73GB1J473J	CHIP R 47K J 1/16W	
R929			R92-1368-05	CHIP R 0 OHM	
R930			RK73GB1J333J	CHIP R 33K J 1/16W	
R932			RN73GH1J273D	CHIP R 27K D 1/16W	
R933		*	RN73GH1J184D	CHIP R 180K D 1/16W	
R934			R92-1368-05	CHIP R 0 OHM	
R937,938			RK73GB1J223J	CHIP R 22K J 1/16W	
R939			RK73HB1J470J	CHIP R 47 J 1/16W	
R940			RK73GB1J223J	CHIP R 22K J 1/16W	
R941,942			RK73HB1J470J	CHIP R 47 J 1/16W	
R943			RK73GB1J333J	CHIP R 33K J 1/16W	
R945			RK73GB1J103J	CHIP R 10K J 1/16W	
R946			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R948			RK73GB1J103J	CHIP R 10K J 1/16W	
R949			RK73GB1J474J	CHIP R 470K J 1/16W	
R950			RK73GB1J394J	CHIP R 390K J 1/16W	
R951			RK73GB1J154J	CHIP R 150K J 1/16W	
R955			RK73GB1J474J	CHIP R 470K J 1/16W	
R956			RK73GB1J123J	CHIP R 12K J 1/16W	
R957			R92-1252-05	CHIP R 0 OHM J 1/16W	
R958,959			RK73GB1J104J	CHIP R 100K J 1/16W	
R960			R92-1252-05	CHIP R 0 OHM J 1/16W	
R961			RK73GB1J394J	CHIP R 390K J 1/16W	
R962			RK73GB1J273J	CHIP R 27K J 1/16W	
R963			RK73GB1J100J	CHIP R 10 J 1/16W	
R964,965			RK73GB1J103J	CHIP R 10K J 1/16W	
R966			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R967			RK73GB1J104J	CHIP R 100K J 1/16W	
R968			RK73GB1J273J	CHIP R 27K J 1/16W	
R969			RK73GB1J274J	CHIP R 270K J 1/16W	
R970,971			RK73GB1J104J	CHIP R 100K J 1/16W	
R973			RK73GB1J104J	CHIP R 100K J 1/16W	
R974			RK73GB1J563J	CHIP R 56K J 1/16W	
R975			R92-1252-05	CHIP R 0 OHM J 1/16W	
R976			RK73GB1J334J	CHIP R 330K J 1/16W	
R977			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R978			RK73GB1J104J	CHIP R 100K J 1/16W	
R980			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R981			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R982			RK73GB1J274J	CHIP R 270K J 1/16W	
R983,984			RK73GB1J104J	CHIP R 100K J 1/16W	
R987			R92-1252-05	CHIP R 0 OHM J 1/16W	
R988			RK73GB1J684J	CHIP R 680K J 1/16W	
R993			RK73GB1J681J	CHIP R 680 J 1/16W	
R994			RK73GB1J104J	CHIP R 100K J 1/16W	
R995			RK73GB1J333J	CHIP R 33K J 1/16W	

PARTS LIST

CONTROL UNIT (X53-4120-10)
TX-RX UNIT (X57-7030-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R996-998			RK73HB1J470J	CHIP R 47 J 1/16W	
R999			R92-1252-05	CHIP R 0 OHM J 1/16W	
K700			S76-0434-05	RELAY	
D650,651			CUS01	DIODE	
D652,653			DA221	DIODE	
D700-704			DA204U	DIODE	
D705			1SS355	DIODE	
D706			DA204U	DIODE	
D707			02DZ18(X,Y)	ZENER DIODE	
D708			DA204U	DIODE	
D709			1SS355	DIODE	
D710			02DZ18(X,Y)	ZENER DIODE	
D711,712			DA204U	DIODE	
D713,714			02DZ18(X,Y)	ZENER DIODE	
D715-717			1SS388	DIODE	
D719			02DZ15(X,Y)	ZENER DIODE	
D720			1SS355	DIODE	
D721			02DZ5.1(Y)	ZENER DIODE	
D722			1SS355	DIODE	
D723			02DZ10(Z)	ZENER DIODE	
D724			1SS355	DIODE	
D725			02DZ18(X,Y)	ZENER DIODE	
D726			DA204U	DIODE	
D727,728			RB706F-40	DIODE	
D731,732			02DZ5.1(Y)	ZENER DIODE	
D734			1SS355	DIODE	
D735			02DZ5.1(Y)	ZENER DIODE	
D736		*	MINISMDC075F24	VARISTOR	
D737			02DZ5.1(Y)	ZENER DIODE	
D738-742		*	AVRM1608C270K2	VARISTOR	
D743,744			DA204U	DIODE	
IC700			RV5C386A	MOS-IC	
IC701			AT24256N10SU27	ROM IC	
IC702			MM1522XURE	ANALOGUE IC	
IC703		*	30625MGP213GP	MICROPROCESSOR IC	
IC704			S-80942CNNBG9C	MOS-IC	
IC705			TC4013BF(N)	MOS-IC	
IC706		*	LM2940T-8.0	MOS-IC	
IC707			TA7805F	MOS-IC	
IC708			XC6204B332M	MOS-IC	
IC709			XC6209B152M	MOS-IC	
IC710			XC6204B332M	MOS-IC	
IC711			XC6204B252M	MOS-IC	
IC712		*	29LV160BE90PBT	ROM IC	
IC713			TC7S08FU	MOS-IC	
IC714			TC75S51F	MOS-IC	
IC715		*	320VC5416GGU12	MICROPROCESSOR IC	
IC716			NJM78L05UA	BI-POLAR IC	
IC717			BU4094BCFV	MOS-IC	
IC718,719			TC75W51FU	MOS-IC	
IC720			TC7W66FK	MOS-IC	
IC721			TC7WH74FK	MOS-IC	
IC722			ADM202EARN	MOS-IC	
IC723			TA75S01F	MOS-IC	
IC724			AK4550VTP	MOS-IC	
IC725,726			TC7WU04FK	MOS-IC	
IC727			BU4053BCFV	MOS-IC	
IC728			BU4094BCFV	MOS-IC	
IC729			TC75W51FU	MOS-IC	
IC730			EX128TQ64I630C	MOS-IC	

Ref. No.	Address	New parts	Parts No.	Description	Destination
IC731			TC7W66FK	MOS-IC	
IC732			TDA8561Q	BI-POLAR IC	
IC733			TC75W51FU	MOS-IC	
IC734			TC7S66FU	MOS-IC	
IC735			TA75W01FU	MOS-IC	
IC736			TC7W66FK	MOS-IC	
IC737			LMC7101BIM5	MOS-IC	
IC738			M62364FP	MOS-IC	
IC739			TA75S01F	MOS-IC	
IC740			LMC7101BIM5	MOS-IC	
IC741			NJM78L05UA	BI-POLAR IC	
IC742			TA75S01F	MOS-IC	
IC743			TC7S66FU	MOS-IC	
Q700,701			2SD2114K(W)	TRANSISTOR	
Q702,703		*	DTC114TUA	DIGITAL TRANSISTOR	
Q704			SSM3K15TE	FET	
Q705			DTC114YE	DIGITAL TRANSISTOR	
Q706			DTA114YE	DIGITAL TRANSISTOR	
Q707			DTC114EE	DIGITAL TRANSISTOR	
Q708,709			DTA114EE	DIGITAL TRANSISTOR	
Q710			DTC114EE	DIGITAL TRANSISTOR	
Q711			DTA114YE	DIGITAL TRANSISTOR	
Q712			DTC114TE	DIGITAL TRANSISTOR	
Q713			2SJ506(S)	FET	
Q714			DTC114YE	DIGITAL TRANSISTOR	
Q715			2SC4738(GR)	TRANSISTOR	
Q716			2SA1832(GR)	TRANSISTOR	
Q717			DTC114YE	DIGITAL TRANSISTOR	
Q719			SSM3K15TE	FET	
Q720			2SJ243	FET	
Q721			SSM3K15TE	FET	
Q723			2SJ243	FET	
Q725			SSM3K15TE	FET	
Q728			DTC114TE	DIGITAL TRANSISTOR	
Q729			2SJ243	FET	
Q730			DTC114EE	DIGITAL TRANSISTOR	
Q731			DTC144EE	DIGITAL TRANSISTOR	
Q732			2SD1757K	TRANSISTOR	
Q733			SSM3K15TE	FET	
Q734			SSM3K15TE	FET	
Q735,736			UM6K1N	FET	

TX-RX UNIT (X57-7030-10) : TK-5710(B)/5710H(B)

C150			CC73GCH1H150J	CHIP C 15PF J	
C151			CC73GCH1H220J	CHIP C 22PF J	
C152			CC73GCH1H270J	CHIP C 27PF J	
C154			CC73GCH1H101J	CHIP C 100PF J	
C155			CK73GB1H102K	CHIP C 1000PF K	
C157			CK73GB1H102K	CHIP C 1000PF K	
C159			CC73GCH1H150J	CHIP C 15PF J	
C160-162			CK73GB1H102K	CHIP C 1000PF K	
C163			C90-4085-05	ALUMINIUM ELECTRO 47UF 20WV	
C164			CK73GB1H102K	CHIP C 1000PF K	
C165			CC73GCH1H180J	CHIP C 18PF J	
C166			CK73GB1H102K	CHIP C 1000PF K	
C167			CC73GCH1H220J	CHIP C 22PF J	
C168,169			CK73GB1H102K	CHIP C 1000PF K	
C170			CC73GCH1H470J	CHIP C 47PF J	

PARTS LIST

TX-RX UNIT (X57-7030-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
C171			CK73GB1H103K	CHIP C 0.010UF K	
C200			CC73GCH1H150J	CHIP C 15PF J	
C201			CC73GCH1H120J	CHIP C 12PF J	
C202			CC73GCH1H330J	CHIP C 33PF J	
C203			CC73GCH1H120J	CHIP C 12PF J	
C204			CC73GCH1H150J	CHIP C 15PF J	
C205			CK73GB1H103K	CHIP C 0.010UF K	
C206,207			CC73GCH1H220J	CHIP C 22PF J	
C208			CC73GCH1H180J	CHIP C 18PF J	
C209,210			CC73GCH1H101J	CHIP C 100PF J	
C211			CK73GB1H103K	CHIP C 0.010UF K	
C212			CC73GCH1H100C	CHIP C 10PF C	
C213			CC73GCH1H220J	CHIP C 22PF J	
C214			CK73GB1H102K	CHIP C 1000PF K	
C215			CC73GCH1H020B	CHIP C 2.0PF B	
C216			CK73GB1H103K	CHIP C 0.010UF K	
C217			CC73GCH1H220J	CHIP C 22PF J	
C218			CC73GCH1H020B	CHIP C 2.0PF B	
C219			CC73GCH1H220J	CHIP C 22PF J	
C220			CC73GCH1H180J	CHIP C 18PF J	
C221			CK73GB1H103K	CHIP C 0.010UF K	
C222			CC73GCH1H101J	CHIP C 100PF J	
C223			CC73GCH1H680J	CHIP C 68PF J	
C224			CC73GCH1H150J	CHIP C 15PF J	
C225			CC73GCH1H020B	CHIP C 2.0PF B	
C226			CC73GCH1H270J	CHIP C 27PF J	
C227			CC73GCH1H080B	CHIP C 8.0PF B	
C228			CC73GCH1H020B	CHIP C 2.0PF B	
C229			CC73GCH1H270J	CHIP C 27PF J	
C230			CK73GB1H103K	CHIP C 0.010UF K	
C231			CC73GCH1H080B	CHIP C 8.0PF B	
C232			CC73GCH1H150J	CHIP C 15PF J	
C233,234			CK73GB1H103K	CHIP C 0.010UF K	
C235			CK73GB1H102K	CHIP C 1000PF K	
C236			CC73FCH1H100D	CHIP C 10PF D	
C237			CC73GCH1H030B	CHIP C 3.0PF B	
C238			CC73GCH1H040B	CHIP C 4.0PF B	
C239,240			CC73GCH1H070B	CHIP C 7.0PF B	
C241			CC73GCH1H101J	CHIP C 100PF J	
C242			CK73GB1H102K	CHIP C 1000PF K	
C243			CK73GB1H103K	CHIP C 0.010UF K	
C244			CC73GCH1H080B	CHIP C 8.0PF B	
C245			CK73GB1C333K	CHIP C 0.033UF K	
C247,248			CK73GB1H103K	CHIP C 0.010UF K	
C249			CC73GCH1H101J	CHIP C 100PF J	
C250			CC73GCH1H120J	CHIP C 12PF J	
C251			CK73GB1H102K	CHIP C 1000PF K	
C252			CK73GB1H103K	CHIP C 0.010UF K	
C253			CK73GB1E103K	CHIP C 0.010UF K	
C254			CC73GCH1H090B	CHIP C 9.0PF B	
C255			CK73GB1H103K	CHIP C 0.010UF K	
C256			CC73GCH1H080B	CHIP C 8.0PF B	
C257,258			CK73GB1H103K	CHIP C 0.010UF K	
C259,260			CC73GCH1H040B	CHIP C 4.0PF B	
C261			CC73GCH1H060B	CHIP C 6.0PF B	
C262			CC73GCH1H070B	CHIP C 7.0PF B	
C263			CC73GCH1H090D	CHIP C 9.0PF D	
C264			CC73GCH1H090B	CHIP C 9.0PF B	
C267			CC73GCH1H080B	CHIP C 8.0PF B	
C268,269			CK73GB1H102K	CHIP C 1000PF K	

Ref. No.	Address	New parts	Parts No.	Description	Destination
C270			CC73GCH1H470J	CHIP C 47PF J	
C271			CC73GCH1H101J	CHIP C 100PF J	
C274			CK73GB1H103K	CHIP C 0.010UF K	
C275,276			CK73GB1C104K	CHIP C 0.10UF K	
C279			CK73GB1C104K	CHIP C 0.10UF K	
C282			CK73GB1E103K	CHIP C 0.010UF K	
C284			CK73GB1C104K	CHIP C 0.10UF K	
C286,287			CK73GB1C104K	CHIP C 0.10UF K	
C289			CC73GCH1H470J	CHIP C 47PF J	
C290			CK73GB1E103K	CHIP C 0.010UF K	
C291			CC73GCH1H101J	CHIP C 100PF J	
C292			CC73GCH1H150J	CHIP C 15PF J	
C294			CC73GCH1H150J	CHIP C 15PF J	
C295-298			CK73GB1C104K	CHIP C 0.10UF K	
C299,300			CK73GB1E103K	CHIP C 0.010UF K	
C301			CK73FB0J106K	CHIP C 10UF K	
C302			CK73GB1C104K	CHIP C 0.10UF K	
C303			CC73GCH1H270J	CHIP C 27PF J	
C304,305			CC73GCH1H181J	CHIP C 180PF J	
C306,307			CK73GB1C104K	CHIP C 0.10UF K	
C309			CK73GB1H152J	CHIP C 1500PF J	
C310			CK73GB1E103K	CHIP C 0.010UF K	
C311			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C312,313			CK73GB1C104K	CHIP C 0.10UF K	
C314			CK73GB1H102K	CHIP C 1000PF K	
C316			CK73GB1H102K	CHIP C 1000PF K	
C318			CK73GB1H102K	CHIP C 1000PF K	
C319			CK73GB1C104K	CHIP C 0.10UF K	
C320			C92-0712-05	CHIP-TAN 22UF 6.3WV	
C321			CK73GB1C104K	CHIP C 0.10UF K	
C322			CK73GB1A224K	CHIP C 0.22UF K	
C323			CC73GCH1H680J	CHIP C 68PF J	
C325-327			CK73GB1C104K	CHIP C 0.10UF K	
C328			CC73GCH1H030B	CHIP C 3.0PF B	
C329			CC73GCH1H120J	CHIP C 12PF J	
C400			CC73GCH1H101J	CHIP C 100PF J	
C401			CK73GB1H102K	CHIP C 1000PF K	
C402			CC73GCH1H101J	CHIP C 100PF J	
C404			CK73GB1H102K	CHIP C 1000PF K	
C407			CK73GB1H102K	CHIP C 1000PF K	
C409			CK73GB1H103K	CHIP C 0.010UF K	
C410			C92-0001-05	CHIP-TAN 0.1UF 35WV	
C412			CK73GB1C104K	CHIP C 0.10UF K	
C413			C92-0003-05	CHIP-TAN 0.47UF 25WV	
C414			CC73GCH1H101J	CHIP C 100PF J	
C415			CK73GF1A105Z	CHIP C 1.0UF Z	
C417			CC73GCH1H100C	CHIP C 10PF C	
C418			CK73GB1C104K	CHIP C 0.10UF K	
C419			C92-0555-05	CHIP-TAN 0.047UF 35WV	
C420,421			CK73GB1H102K	CHIP C 1000PF K	
C422			CC73GCH1H101J	CHIP C 100PF J	
C424			CC73GCH1H1R5B	CHIP C 1.5PF B	
C425,426			CK73GB1H102K	CHIP C 1000PF K	
C427			CK73GF1A105Z	CHIP C 1.0UF Z	
C428-431			CK73GB1H471K	CHIP C 470PF K	
C432			CC73GCH1H300J	CHIP C 30PF J	
C433			CC73GCH1H180J	CHIP C 18PF J	
C434			CC73GCH1H030B	CHIP C 3.0PF B	
C435			CC73GCH1H1R5B	CHIP C 1.5PF B	
C437			CK73GB1E105K	CHIP C 1.0UF K	

PARTS LIST

TX-RX UNIT (X57-7030-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
C438			CC73GCH1H300J	CHIP C 30PF J	
C439			CC73GCH1H150J	CHIP C 15PF J	
C440,441			CK73GB1H102K	CHIP C 1000PF K	
C442,443			CK73GB1H471K	CHIP C 470PF K	
C446			CK73GB1H102K	CHIP C 1000PF K	
C447			C92-0602-05	CHIP-TAN 1.0UF 10WV	
C448			CK73GB1H103K	CHIP C 0.010UF K	
C449			CC73GCH1H101J	CHIP C 100PF J	
C451			CK73GB1H102K	CHIP C 1000PF K	
C452,453			CC73GCH1H101J	CHIP C 100PF J	
C454,455			CK73GB1H103K	CHIP C 0.010UF K	
C456			C92-0633-05	CHIP-TAN 22UF 10WV	
C458-460			CK73GB1H102K	CHIP C 1000PF K	
C462			C92-0696-05	CHIP-TAN Ÿ47U 10WV	
C463,464			CK73GB1H103K	CHIP C 0.010UF K	
C466			C92-0628-05	CHIP-TAN 10UF 10WV	
C467			CK73GB1H102K	CHIP C 1000PF K	
C469			CC73GCH1H680G	CHIP C 68PF G	
C470			CC73GCH1H560G	CHIP C 56PF G	
C471			CK73GB1H102K	CHIP C 1000PF K	
C472			CC73GCH1H560G	CHIP C 56PF G	
C473,474			CK73GB1H102K	CHIP C 1000PF K	
C476,477			CK73GB1H102K	CHIP C 1000PF K	
C478			CC73GCH1H560G	CHIP C 56PF G	
C481			CC73GCH1HR75B	CHIP C 0.75PF B	
C482			CC73GCH1H080B	CHIP C 8.0PF B	
C483-485			CC73GCH1H090B	CHIP C 9.0PF B	
C486,487			CC73GCH1H080B	CHIP C 8.0PF B	
C490,491			CC73GCH1H090B	CHIP C 9.0PF B	
C493			CC73GCH1H010B	CHIP C 1.0PF B	
C495			CK73GB1H102K	CHIP C 1000PF K	
C496,497			CC73GCH1H010B	CHIP C 1.0PF B	
C499			CK73GB1H102K	CHIP C 1000PF K	
C501			CK73GB1H102K	CHIP C 1000PF K	
C502			CC73GCH1H150J	CHIP C 15PF J	
C504			CK73GB1H102K	CHIP C 1000PF K	
C505,506			CC73GCH1H050B	CHIP C 5.0PF B	
C507,508			CK73GB1H102K	CHIP C 1000PF K	
C509			CC73GCH1H1R5B	CHIP C 1.5PF B	
C510,511			CK73GB1H102K	CHIP C 1000PF K	
C512			CC73GCH1H150J	CHIP C 15PF J	
C513			CK73GB1H102K	CHIP C 1000PF K	
C514			CC73GCH1H101J	CHIP C 100PF J	
C515			CK73GB1H102K	CHIP C 1000PF K	
C520			CC73GCH1H101J	CHIP C 100PF J	
C521			CK73GB1C104K	CHIP C 0.10UF K	
C522			CC73GCH1H101J	CHIP C 100PF J	
C523			CK73GB1C104K	CHIP C 0.10UF K	
C549,550			CK73GB1E103K	CHIP C 0.010UF K	
C551			CC73GCH1H101J	CHIP C 100PF J	
C552			CK73GB1E103K	CHIP C 0.010UF K	
C590			CK73GB1C104K	CHIP C 0.10UF K	
C591			CK73GB1H102K	CHIP C 1000PF K	
C592			CK73GB1E103K	CHIP C 0.010UF K	
C596			CK73GB1H102K	CHIP C 1000PF K	
C600			C92-0044-05	CHIP-ELE 47UF 10WV	
C601			CK73GB1H102K	CHIP C 1000PF K	
C602			CK73GB1C104K	CHIP C 0.10UF K	
C603			CK73GB1H103K	CHIP C 0.010UF K	
C604			C92-0023-05	CHIP-ELE 1.0UF 50WV	

Ref. No.	Address	New parts	Parts No.	Description	Destination
C605			CK73GB1C104K	CHIP C 0.10UF K	
C606			C92-0585-05	CHIP-TAN 4.7UF 16WV	
C607-610			CK73GB1H102K	CHIP C 1000PF K	
C612-629			CK73GB1H102K	CHIP C 1000PF K	
C630			C92-0004-05	CHIP-TAN 1.0UF 16WV	
C631-635			CK73GB1H102K	CHIP C 1000PF K	
C636			CC73GCH1H220J	CHIP C 22PF J	
C638-640			CK73GB1H102K	CHIP C 1000PF K	
C641			CC73GCH1H100C	CHIP C 10PF C	
C642			CK73GB1H102K	CHIP C 1000PF K	
CN150			E04-0154-05	PIN SOCKET	
CN152			E04-0154-05	PIN SOCKET	
CN200,201			E04-0154-05	PIN SOCKET	
CN202,203			E40-5538-05	PIN ASSY	
CN600		*	E40-6438-05	FLAT CABLE CONNECTOR	
CN601		*	E40-6429-05	FLAT CABLE CONNECTOR	
CN602		*	E37-1235-05	JUMPER WIRE	
CF200			L72-1018-05	CERAMIC FILTER	
CF201		*	L72-1016-05	CERAMIC FILTER	
CF202			L72-1009-05	CERAMIC FILTER	
CF203			L72-1018-05	CERAMIC FILTER	
CF204		*	L72-1016-05	CERAMIC FILTER	
L150-152			L40-5675-92	SMALL FIXED INDUCTOR(56NH)	
L153			L40-8275-92	SMALL FIXED INDUCTOR(82NH)	
L154			L40-4775-92	SMALL FIXED INDUCTOR(47NH)	
L200,201		*	L41-2778-08	SMALL FIXED INDUCTOR(27NH)	
L202		*	L41-8278-08	SMALL FIXED INDUCTOR(82NH)	
L203		*	L41-3388-08	SMALL FIXED INDUCTOR(330NH)	
L204		*	L41-3378-08	SMALL FIXED INDUCTOR(33NH)	
L205		*	L41-3388-08	SMALL FIXED INDUCTOR(330NH)	
L206		*	L41-8278-08	SMALL FIXED INDUCTOR(82NH)	
L207		*	L41-2788-08	SMALL FIXED INDUCTOR(270NH)	
L208		*	L41-6888-08	SMALL FIXED INDUCTOR(680NH)	
L209		*	L41-1588-08	SMALL FIXED INDUCTOR(150NH)	
L211-213		*	L41-3378-08	SMALL FIXED INDUCTOR(33NH)	
L214		*	L41-4778-08	SMALL FIXED INDUCTOR(47NH)	
L215			L40-6881-37	SMALL FIXED INDUCTOR(0.680UH)	
L216,217		*	L41-1008-08	SMALL FIXED INDUCTOR(10UH)	
L219			L40-5681-86	SMALL FIXED INDUCTOR(0.56UH)	
L221-223			L34-4080-05	COIL	
L224,225		*	L34-4748-05	COIL	
L226,227		*	L34-4749-05	COIL	
L228,229		*	L34-4748-05	COIL	
L230,231		*	L34-4749-05	COIL	
L232			L34-4725-05	COIL	
L233		*	L41-1588-08	SMALL FIXED INDUCTOR(150NH)	
L401			L41-6868-14	SMALL FIXED INDUCTOR(6.8NH)	
L402			L41-8268-14	SMALL FIXED INDUCTOR(8.2NH)	
L403,404			L41-6878-14	SMALL FIXED INDUCTOR(68NH)	
L405			L41-6868-14	SMALL FIXED INDUCTOR(6.8NH)	
L406			L41-1078-14	SMALL FIXED INDUCTOR(10NH)	
L407		*	L41-4798-08	SMALL FIXED INDUCTOR(4.7UH)	
L408			L41-3398-08	SMALL FIXED INDUCTOR(3.3UH)	
L410			L41-2798-08	SMALL FIXED INDUCTOR(2.7UH)	
L412,413		*	L41-1898-08	SMALL FIXED INDUCTOR(1.8UH)	
L414			L41-2798-08	SMALL FIXED INDUCTOR(2.7UH)	
L415		*	L41-1898-08	SMALL FIXED INDUCTOR(1.8UH)	
L417		*	L41-1898-08	SMALL FIXED INDUCTOR(1.8UH)	
L418			L41-2798-08	SMALL FIXED INDUCTOR(2.7UH)	
L420		*	L41-1898-08	SMALL FIXED INDUCTOR(1.8UH)	

PARTS LIST

TX-RX UNIT (X57-7030-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
L421			L41-3398-08	SMALL FIXED INDUCTOR(3.3UH)	
L422			L41-2798-08	SMALL FIXED INDUCTOR(2.7UH)	
L423,424		*	L41-5698-08	SMALL FIXED INDUCTOR(5.6UH)	
L426			L41-2798-08	SMALL FIXED INDUCTOR(2.7UH)	
L427			L41-3398-08	SMALL FIXED INDUCTOR(3.3UH)	
L428		*	L41-4798-08	SMALL FIXED INDUCTOR(4.7UH)	
L429			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	
L431			L40-5675-92	SMALL FIXED INDUCTOR(56NH)	
L432			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	
L434-437			L92-0140-05	CHIP FERRITE	
L447			L34-4610-05	AIR-CORE COIL	
L449			L34-4613-05	AIR-CORE COIL	
L450			L34-4612-05	AIR-CORE COIL	
L453			L40-5675-92	SMALL FIXED INDUCTOR(56NH)	
L454-457			L92-0140-05	CHIP FERRITE	
L460-462			L92-0140-05	CHIP FERRITE	
L463		*	L41-2778-08	SMALL FIXED INDUCTOR(27NH)	
X200			L77-1961-05	VCXO(16.8MHZ)	
X400			L77-1960-05	VCXO(16.8MHZ)	
XF200		*	L71-0625-05	CRYSTAL FILTER (49.95MHZ,WIDE)	
XF201		*	L71-0626-05	CRYSTAL FILTER (49.95MHZ,NARROW)	
R150			RK73GB1J121J	CHIP R 120 J 1/16W	
R151			RK73GB1J470J	CHIP R 47 J 1/16W	
R152			RK73GB1J121J	CHIP R 120 J 1/16W	
R153,154			R92-1252-05	CHIP R 0 OHM J 1/16W	
R155			RK73GB1J123J	CHIP R 12K J 1/16W	
R157			RK73GB1J470J	CHIP R 47 J 1/16W	
R159			RK73GB1J221J	CHIP R 220 J 1/16W	
R160			RK73GB1J101J	CHIP R 100 J 1/16W	
R163			RK73GB1J101J	CHIP R 100 J 1/16W	
R164			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R166			RK73FB2A100J	CHIP R 10 J 1/10W	
R168			RK73FB2A100J	CHIP R 10 J 1/10W	
R170			RK73FB2A221J	CHIP R 220 J 1/10W	
R171			RK73FB2A220J	CHIP R 22 J 1/10W	
R172			RK73FB2A221J	CHIP R 220 J 1/10W	
R175			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R200			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R201			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R202			RK73GB1J470J	CHIP R 47 J 1/16W	
R203			RK73GB1J120J	CHIP R 12 J 1/16W	
R204			RK73GB1J821J	CHIP R 820 J 1/16W	
R205			RK73GB1J330J	CHIP R 33 J 1/16W	
R206			RK73GB1J821J	CHIP R 820 J 1/16W	
R207-209			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R210			RK73GB1J101J	CHIP R 100 J 1/16W	
R211			RK73GB1J473J	CHIP R 47K J 1/16W	
R212			R92-1252-05	CHIP R 0 OHM J 1/16W	
R213			RK73GB1J821J	CHIP R 820 J 1/16W	
R214			RK73GB1J5R6J	CHIP R 5.6 J 1/16W	
R215			RK73GB1J821J	CHIP R 820 J 1/16W	
R216			RK73GB1J470J	CHIP R 47 J 1/16W	
R217			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R218			RK73FB2A821J	CHIP R 820 J 1/10W	
R219			RK73FB2A5R6J	CHIP R 5.6 J 1/10W	
R220			RK73FB2A821J	CHIP R 820 J 1/10W	
R221			RK73GB1J120J	CHIP R 12 J 1/16W	
R222			RK73GB1J330J	CHIP R 33 J 1/16W	
R223			RK73GB1J103J	CHIP R 10K J 1/16W	
R224			RK73GB1J472J	CHIP R 4.7K J 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R225,226			R92-1252-05	CHIP R 0 OHM J 1/16W	
R228			RK73GB1J182J	CHIP R 1.8K J 1/16W	
R229			RK73GB1J153J	CHIP R 15K J 1/16W	
R230			RK73GB1J682J	CHIP R 6.8K J 1/16W	
R231			R92-1252-05	CHIP R 0 OHM J 1/16W	
R232			RK73GB1J560J	CHIP R 56 J 1/16W	
R233			RK73GB1J270J	CHIP R 27 J 1/16W	
R235			RK73GB1J473J	CHIP R 47K J 1/16W	
R236			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R237,238			RK73GB1J104J	CHIP R 100K J 1/16W	
R239			RK73GB1J473J	CHIP R 47K J 1/16W	
R240			R92-1252-05	CHIP R 0 OHM J 1/16W	
R248			RK73GB1J331J	CHIP R 330 J 1/16W	
R249			RK73GB1J470J	CHIP R 47 J 1/16W	
R251			R92-1252-05	CHIP R 0 OHM J 1/16W	
R252			RK73GB1J822J	CHIP R 8.2K J 1/16W	
R253			RK73GB1J470J	CHIP R 47 J 1/16W	
R254			RK73GB1J684J	CHIP R 680K J 1/16W	
R255			R92-1252-05	CHIP R 0 OHM J 1/16W	
R256			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R257			RK73GB1J220J	CHIP R 22 J 1/16W	
R258			R92-1252-05	CHIP R 0 OHM J 1/16W	
R259			RK73GB1J104J	CHIP R 100K J 1/16W	
R260			RK73GB1J274J	CHIP R 270K J 1/16W	
R261			RK73GB1J273J	CHIP R 27K J 1/16W	
R262			RK73GB1J333J	CHIP R 33K J 1/16W	
R263,264			R92-1252-05	CHIP R 0 OHM J 1/16W	
R265			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R266			RK73GB1J273J	CHIP R 27K J 1/16W	
R267			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R268			RK73GB1J470J	CHIP R 47 J 1/16W	
R269			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R270			RK73GB1J224J	CHIP R 220K J 1/16W	
R271			RK73GB1J471J	CHIP R 470 J 1/16W	
R272			R92-1252-05	CHIP R 0 OHM J 1/16W	
R273-275			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R276			R92-1252-05	CHIP R 0 OHM J 1/16W	
R277			RK73GB1J683J	CHIP R 68K J 1/16W	
R278			RK73GB1J224J	CHIP R 220K J 1/16W	
R279			RK73GB1J104J	CHIP R 100K J 1/16W	
R280			RK73GB1J473J	CHIP R 47K J 1/16W	
R281-283			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R284			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R285			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R286			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R287-291			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R292			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R294-299			R92-1252-05	CHIP R 0 OHM J 1/16W	
R303			RK73GB1J681J	CHIP R 680 J 1/16W	
R305			RK73GB1J220J	CHIP R 22 J 1/16W	
R306-308			R92-1252-05	CHIP R 0 OHM J 1/16W	
R309			RK73GB1J103J	CHIP R 10K J 1/16W	
R312-314			R92-1252-05	CHIP R 0 OHM J 1/16W	
R316			R92-1252-05	CHIP R 0 OHM J 1/16W	
R317			RK73GB1J331J	CHIP R 330 J 1/16W	
R318			RK73GB1J681J	CHIP R 680 J 1/16W	
R326-329			RK73GB1J182J	CHIP R 1.8K J 1/16W	
R330			R92-1252-05	CHIP R 0 OHM J 1/16W	
R400-403			RK73GB1J101J	CHIP R 100 J 1/16W	
R404			RK73GB1J102J	CHIP R 1.0K J 1/16W	

PARTS LIST

TX-RX UNIT (X57-7030-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R405			RK73GB1J563J	CHIP R 56K J 1/16W	
R406			RK73GB1J103J	CHIP R 10K J 1/16W	
R407,408			RK73GB1J104J	CHIP R 100K J 1/16W	
R409			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R410			RK73GB1J152J	CHIP R 1.5K J 1/16W	
R411			RK73GB1J561J	CHIP R 560 J 1/16W	
R412			R92-1252-05	CHIP R 0 OHM J 1/16W	
R413			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R414			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R415			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R416			R92-1252-05	CHIP R 0 OHM J 1/16W	
R418			RK73GB1J330J	CHIP R 33 J 1/16W	
R419			RK73GB1J101J	CHIP R 100 J 1/16W	
R420			RK73GB1J470J	CHIP R 47 J 1/16W	
R422			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R423,424			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R425			RK73GB1J223J	CHIP R 22K J 1/16W	
R426			RK73GB1J103J	CHIP R 10K J 1/16W	
R427,428			RK73GB1J104J	CHIP R 100K J 1/16W	
R430			R92-1252-05	CHIP R 0 OHM J 1/16W	
R431,432			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R435			RK73GB1J223J	CHIP R 22K J 1/16W	
R436			RK73GB1J103J	CHIP R 10K J 1/16W	
R437			RK73GB1J184J	CHIP R 180K J 1/16W	
R439			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R440			RK73GB1J274J	CHIP R 270K J 1/16W	
R441,442			RK73GB1J104J	CHIP R 100K J 1/16W	
R445			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R447			R92-1252-05	CHIP R 0 OHM J 1/16W	
R449			R92-1252-05	CHIP R 0 OHM J 1/16W	
R451			R92-1252-05	CHIP R 0 OHM J 1/16W	
R454			RK73GB1J152J	CHIP R 1.5K J 1/16W	
R455			RK73GB1J100J	CHIP R 10 J 1/16W	
R457			RK73GB1J223J	CHIP R 22K J 1/16W	
R458			RN73GH1J471D	CHIP R 470 D 1/16W	
R459			RN73GH1J101D	CHIP R 100 D 1/16W	
R461			RK73GB1J103J	CHIP R 10K J 1/16W	
R463			RK73GB1J104J	CHIP R 100K J 1/16W	
R465			RN73GH1J561D	CHIP R 560 D 1/16W	
R467		*	RN73GH1J331D	CHIP R 330 D 1/16W	
R468			RN73GH1J391D	CHIP R 390 D 1/16W	
R469		*	RN73GH1J331D	CHIP R 330 D 1/16W	
R470			RN73GH1J101D	CHIP R 100 D 1/16W	
R472			RN73GH1J101D	CHIP R 100 D 1/16W	
R473		*	RN73GH1J221D	CHIP R 220 D 1/16W	
R474			RK73GB1J224J	CHIP R 220K J 1/16W	
R476			RK73GB1J330J	CHIP R 33 J 1/16W	
R477			R92-1252-05	CHIP R 0 OHM J 1/16W	
R478			RK73GB1J331J	CHIP R 330 J 1/16W	
R480			R92-1252-05	CHIP R 0 OHM J 1/16W	
R482,483			RK73GB1J103J	CHIP R 10K J 1/16W	
R484,485			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R486			RK73GB1J101J	CHIP R 100 J 1/16W	
R487			RK73GB1J271J	CHIP R 270 J 1/16W	
R488			RK73GB1J331J	CHIP R 330 J 1/16W	
R490			RK73GB1J101J	CHIP R 100 J 1/16W	
R491			RK73GB1J330J	CHIP R 33 J 1/16W	
R492			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R493,494			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R496			RK73GB1J101J	CHIP R 100 J 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R500,501			R92-0670-05	CHIP R 0 OHM	
R503			R92-0670-05	CHIP R 0 OHM	
R505			R92-0670-05	CHIP R 0 OHM	
R509-511			RK73GB1J101J	CHIP R 100 J 1/16W	
R512			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R513			RK73GB1J220J	CHIP R 22 J 1/16W	
R514			RK73GB1J183J	CHIP R 18K J 1/16W	
R515-518			RK73GB1J101J	CHIP R 100 J 1/16W	
R519			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R521			RK73GB1J473J	CHIP R 47K J 1/16W	
R522			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R588			R92-0670-05	CHIP R 0 OHM	
R589			R92-1252-05	CHIP R 0 OHM J 1/16W	
R590,591			RK73GB1J103J	CHIP R 10K J 1/16W	
R592			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R593			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R594			RK73GB1J103J	CHIP R 10K J 1/16W	
R595-597			R92-1252-05	CHIP R 0 OHM J 1/16W	
R600			RK73GB1J473J	CHIP R 47K J 1/16W	
R601			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R602			RK73GB1J473J	CHIP R 47K J 1/16W	
R603			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R622			R92-1252-05	CHIP R 0 OHM J 1/16W	
R635,636			R92-1252-05	CHIP R 0 OHM J 1/16W	
R637			RK73GB1J105J	CHIP R 1.0M J 1/16W	
D200-202			1SV286	VARIABLE CAPACITANCE DIODE	
D203			RB706F-40	DIODE	
D204			1SS388	DIODE	
D205-212			HVC131	DIODE	
D400-403			MA2S077	DIODE	
D404			MA742	DIODE	
D405-407			HVC376B	VARIABLE CAPACITANCE DIODE	
D414-416			HVC376B	VARIABLE CAPACITANCE DIODE	
D420			1SV282	VARIABLE CAPACITANCE DIODE	
D422			1SV282	VARIABLE CAPACITANCE DIODE	
D424			1SV282	VARIABLE CAPACITANCE DIODE	
D427-432			1SV282	VARIABLE CAPACITANCE DIODE	
D433			1SV278	VARIABLE CAPACITANCE DIODE	
D435,436			HVC131	DIODE	
IC204			TC75S51F	MOS-IC	
IC205-207			TC7W53FK	HYBRID IC	
IC209-211			TC7W53FK	HYBRID IC	
IC212			TA31137FN	MOS-IC	
IC213			TC7WU04FK	MOS-IC	
IC214			TC7S66FU	MOS-IC	
IC400		*	LMX2352TMX/NP	ANALOGUE IC	
IC401			MCP41100T	ANALOGUE IC	
IC402			LMC7101BIM5	MOS-IC	
IC600			BU4094BCFV	MOS-IC	
IC601			TA7805F	MOS-IC	
Q150,151			2SC3357(RF)	TRANSISTOR	
Q200-202			2SC3357(RF)	TRANSISTOR	
Q203			2SC4215(Y)	TRANSISTOR	
Q205			2SC5108(Y)	TRANSISTOR	
Q206			DTA144EE	DIGITAL TRANSISTOR	
Q207			SSM3K15TE	FET	
Q208			2SC4617(S)	TRANSISTOR	
Q209			DTC114EE	DIGITAL TRANSISTOR	
Q212			DTA114EE	DIGITAL TRANSISTOR	
Q213			DTC114EE	DIGITAL TRANSISTOR	

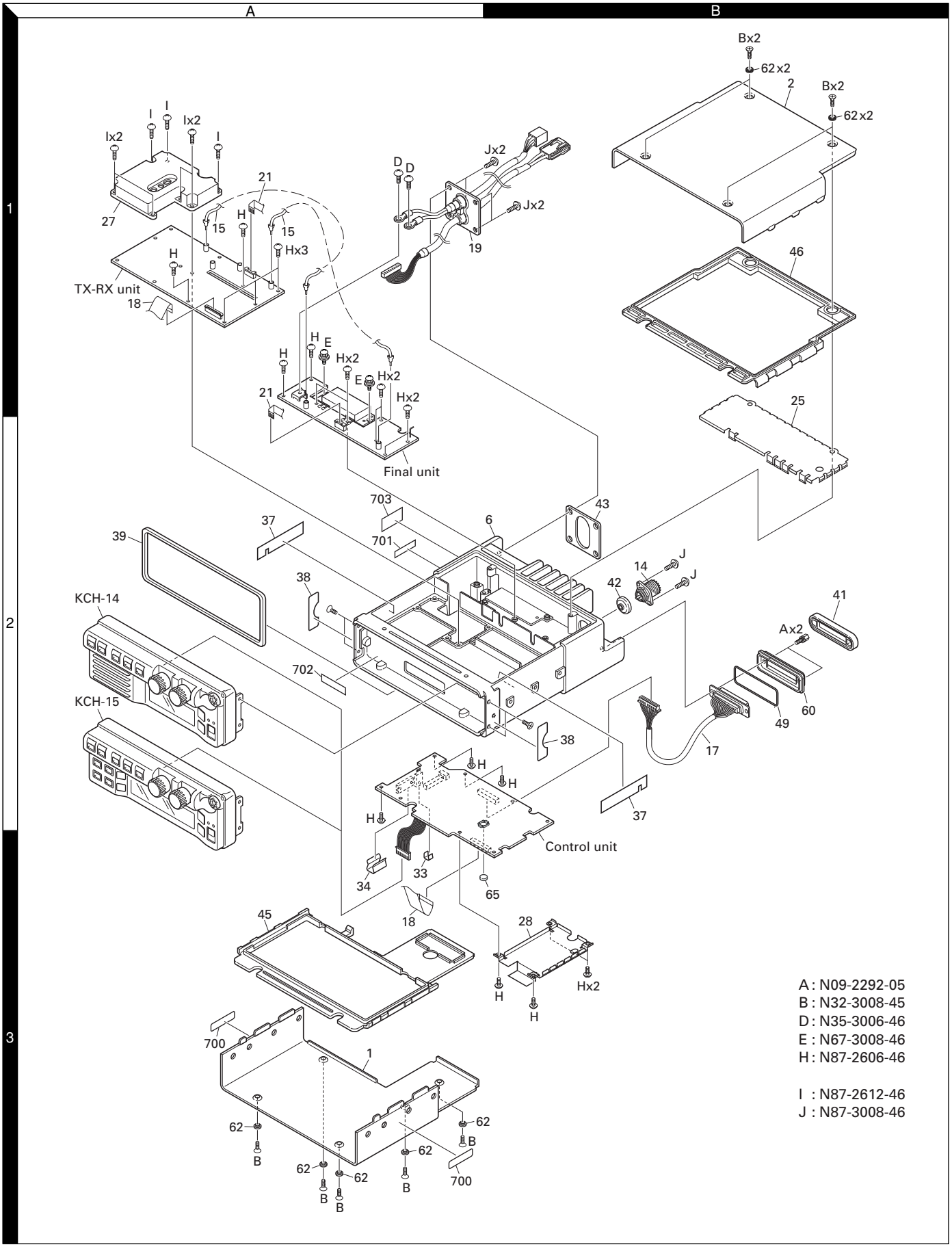
PARTS LIST

TX-RX UNIT (X57-7030-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
Q400			2SK879(GR,Y)	FET	
Q401			DTA144EE	DIGITAL TRANSISTOR	
Q402			DTC144EE	DIGITAL TRANSISTOR	
Q403			2SC5108(Y)	TRANSISTOR	
Q404,405			RN47A4	TRANSISTOR	
Q406,407			2SJ347	FET	
Q408,409			RN47A4	TRANSISTOR	
Q412			2SC4116(GR)	TRANSISTOR	
Q413,414			2SK508NV(52K)	FET	
Q416			2SK508NV(K52)	FET	
Q417-419			2SC5108(Y)	TRANSISTOR	
Q598			2SA1832(GR)	TRANSISTOR	
Q599			DTC144EE	DIGITAL TRANSISTOR	
Q600			DTC114EE	DIGITAL TRANSISTOR	
Q601			2SB1132(Q,R)	TRANSISTOR	
Q602			DTC114EE	DIGITAL TRANSISTOR	
Q603			2SB1132(Q,R)	TRANSISTOR	
TH201			B57331V2104J	THERMISTOR	
A400			W02-1939-05	DBM	

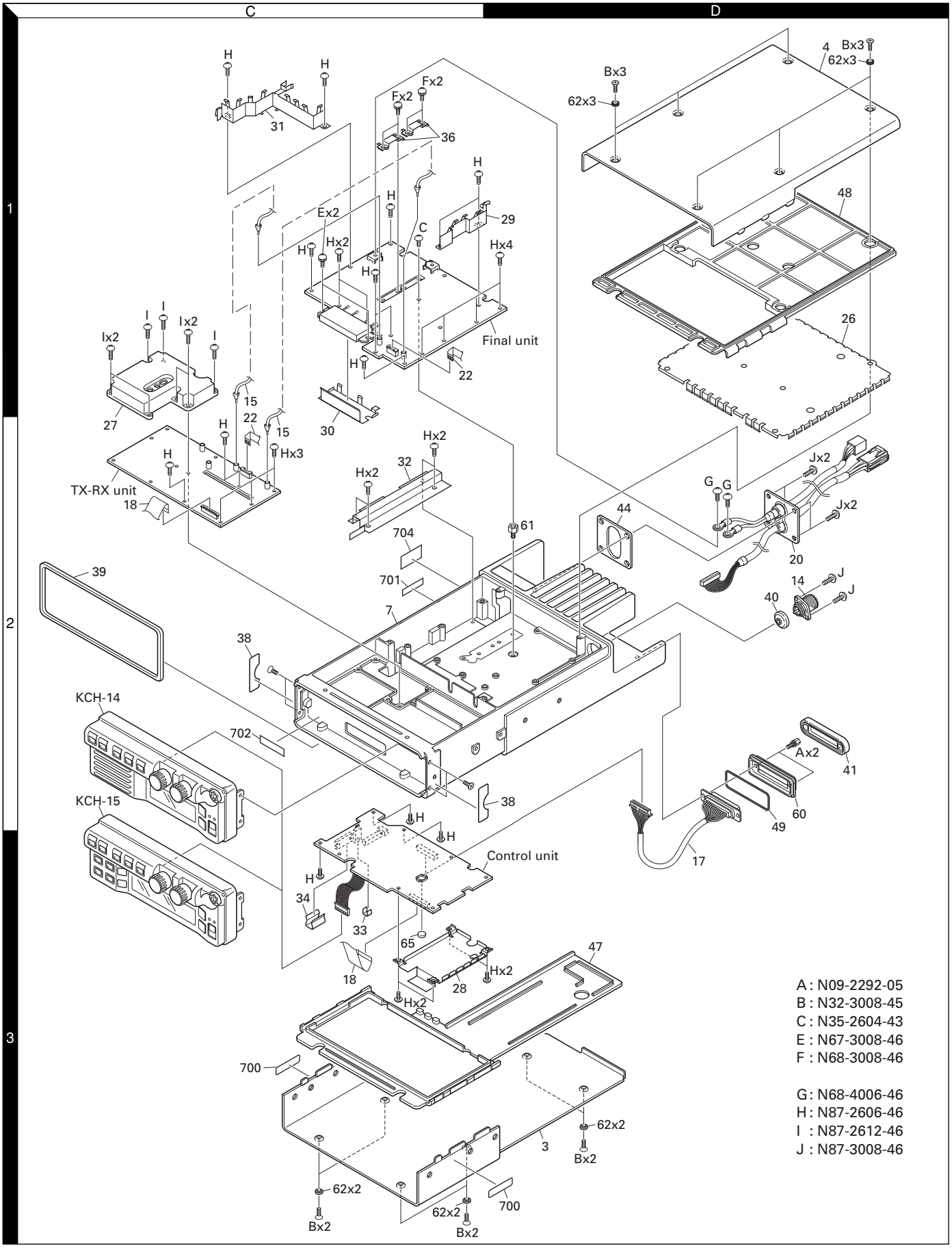
Ref. No.	Address	New parts	Parts No.	Description	Destination

EXPLODED VIEW (TK-5710(B))



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

EXPLODED VIEW (TK-5710H(B))

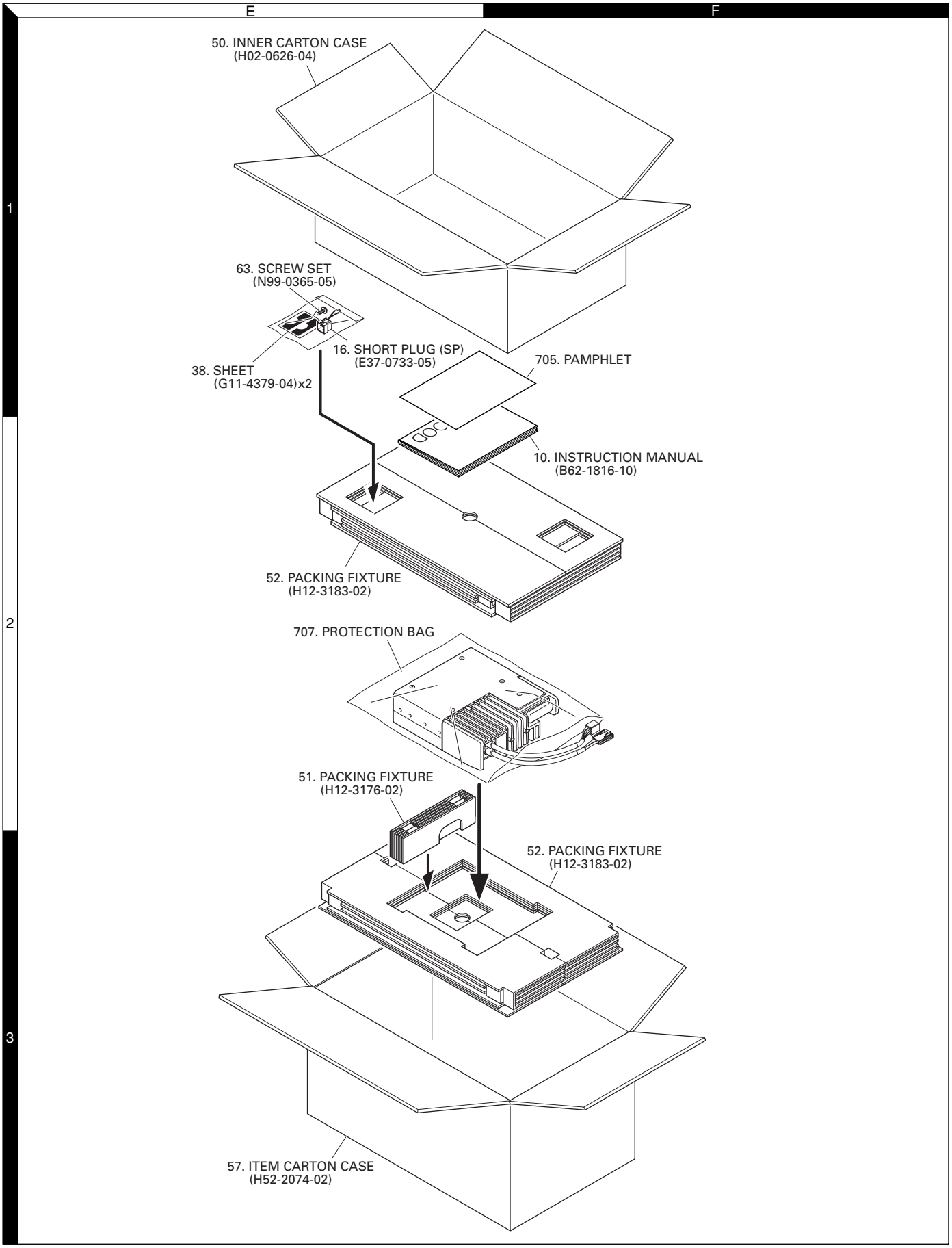


A : N09-2292-05
B : N32-3008-45
C : N35-2604-43
E : N67-3008-46
F : N68-3008-46

G : N68-4006-46
H : N87-2606-46
I : N87-2612-46
J : N87-3008-46

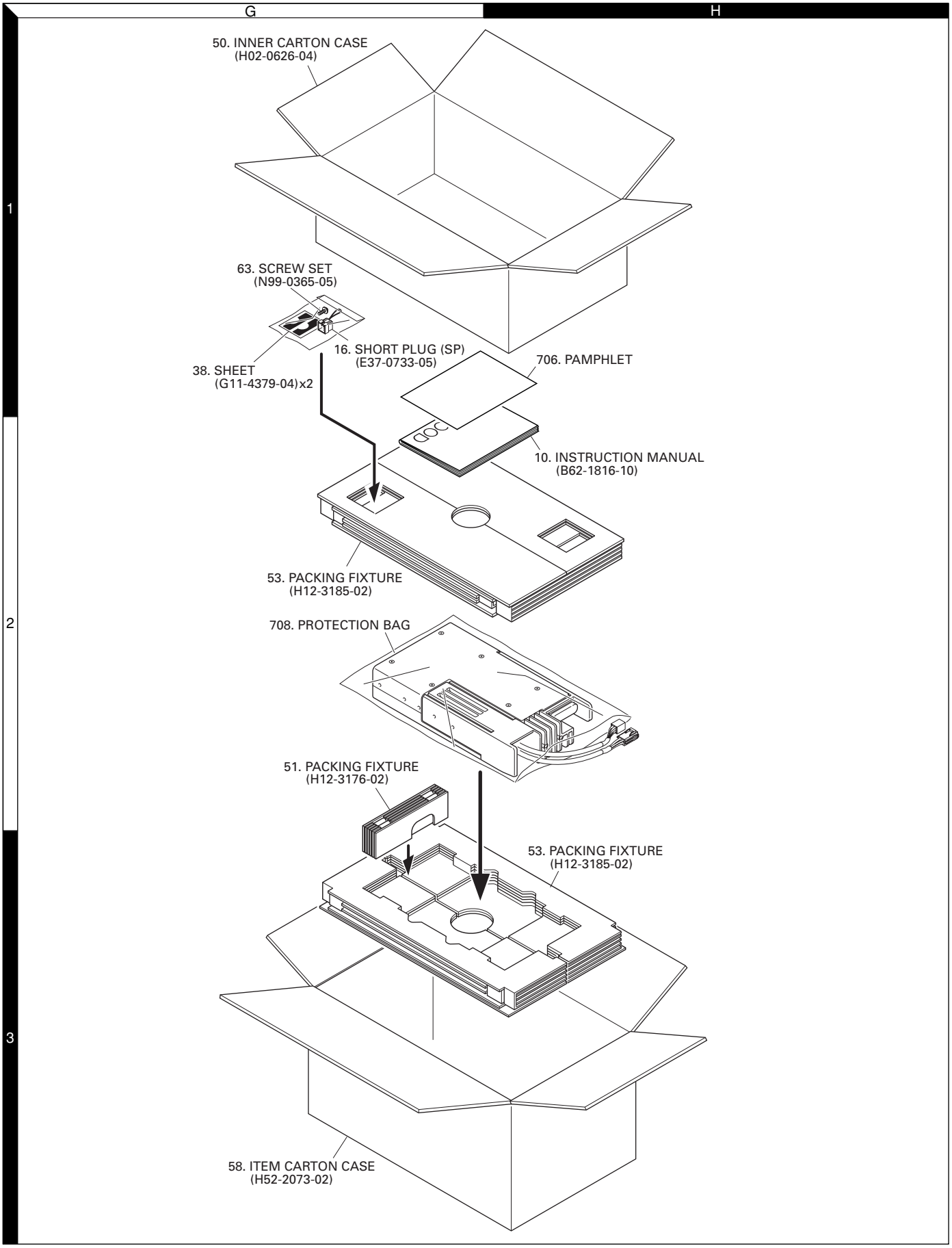
Parts with the exploded numbers larger than 700 are not supplied.

PACKING (TK-5710(B))



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

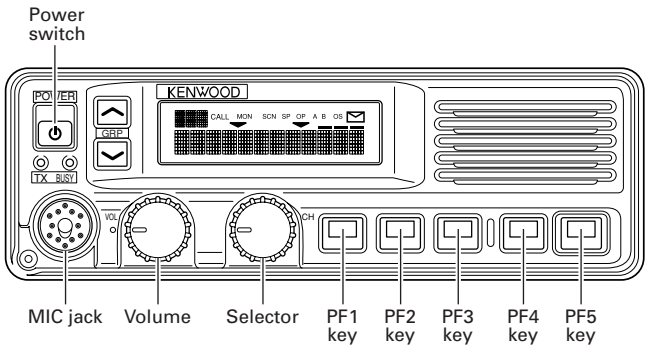
PACKING (TK-5710H(B))



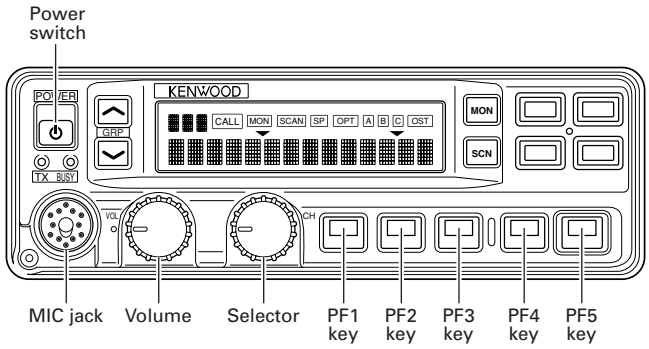
ADJUSTMENT

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/APCO	Wide :"W"appears Narrow:"N"appears APCO :"A"appears
[GRP∧]	Shifts to the Panel tuning mode	–
[GRP∨]	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.	–

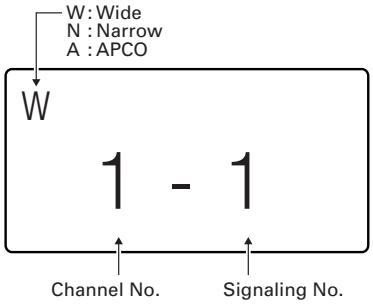
Key	"FNC" appears	
	Function	**Display**
[Selector]	Function off	–
[GRP∧]	Squelch level 0	On :▼ icon appears
[GRP∨]	High power/Low power	Low: **SP** icon appears
[PF1]	Compander on/off	On : **A** icon appears
[PF2]	LCD all lights	LCD all point appears
[PF3]	MSK 1200bps/2400bps	2400bps: **CALL** icon 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	APCO (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**

Channel No.	RX (MHz)	TX (MHz)
1	155.10000	155.00000
2	136.10000	136.00000
3	173.80000	173.97500
4	155.00000	155.00000
5	155.20000	155.20000
6	155.40000	155.40000
7	154.90000	154.90000
8	145.40000	145.40000
9	164.40000	164.40000

- **Test Signaling**

Signaling No.	RX	TX	APCO/ 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	APCO
18	NAC 023	NAC 023	APCO
19	NAC 5EA	NAC 5EA	APCO
20	1011Hz Tone Test Pattern	1011Hz Tone Test Pattern	APCO
21	NAC 293	Silence Pattern	APCO
22	NAC 293	Calibration Pattern	APCO
23	NAC 293	Transmitter Test Pattern	APCO
24	NAC 293	Symbol Rate Pattern	APCO
25	NAC 293	Low Deviation Pattern	APCO
26	NAC 293	Fidelity Pattern	APCO

ADJUSTMENT

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.

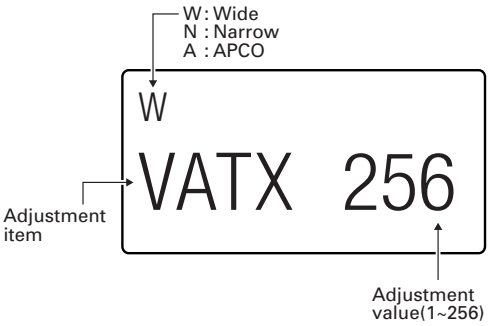
■ Transceiver tuning (To enter tuning mode)

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

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

Use the [PF2] key to select the adjustment item through tuning modes. Use the [GRP∨] key to exit 3 or 5 reference level adjustments.

• LCD display in the panel tuning mode



■ Key operation

Key	Function
[Selector]	Unused
[GRP∧]	Exit the panel tuning mode and shift to the panel test mode.
[GRP∨]	Exit the 3 or 5 reference level adjustments without backup.
[PF1]	Back to the last adjustment item (The current adjustment data is cleared.)
[PF2]	Go to the next adjustment item (The current adjustment data is cleared.)
[PF3]	Adjustment value down
[PF3] Hold	Adjustment value continuation down
[PF4]	Adjustment value up
[PF4] Hold	Adjustment value continuation up
[PF5]	Enter the 3 or 5 reference level adjustments without backup.
MIC PTT	Transmit

■ 3 or 5 reference level adjustments frequency

• Assist voltage adjustments

TX assist voltage

Tuning point	Display	TX (MHz)
Low	L	136.00000
Low'	LC	145.50000
Center	C	155.00000
High'	CH	164.50000
High	H	174.00000

RX assist voltage (Upper)

Tuning point	Display	RX (MHz)
Low	L	204.95000
Low'	LC	209.70000
Center	C	214.45000
High'	CH	219.20000
High	H	223.95000

RX assist voltage (Lower)

Tuning point	Display	RX (MHz)
Low	L	185.95000
Low'	LC	190.70000
Center	C	195.45000
High'	CH	200.20000
High	H	204.94750

• Adjustment items other than assist voltage

Tuning point	Display	RX (MHz)	TX (MHz)
Low	L	136.10000	136.00000
Low'	LC	145.60000	145.50000
Center	C	155.10000	155.00000
High'	CH	164.60000	164.50000
High	H	173.90000	174.00000

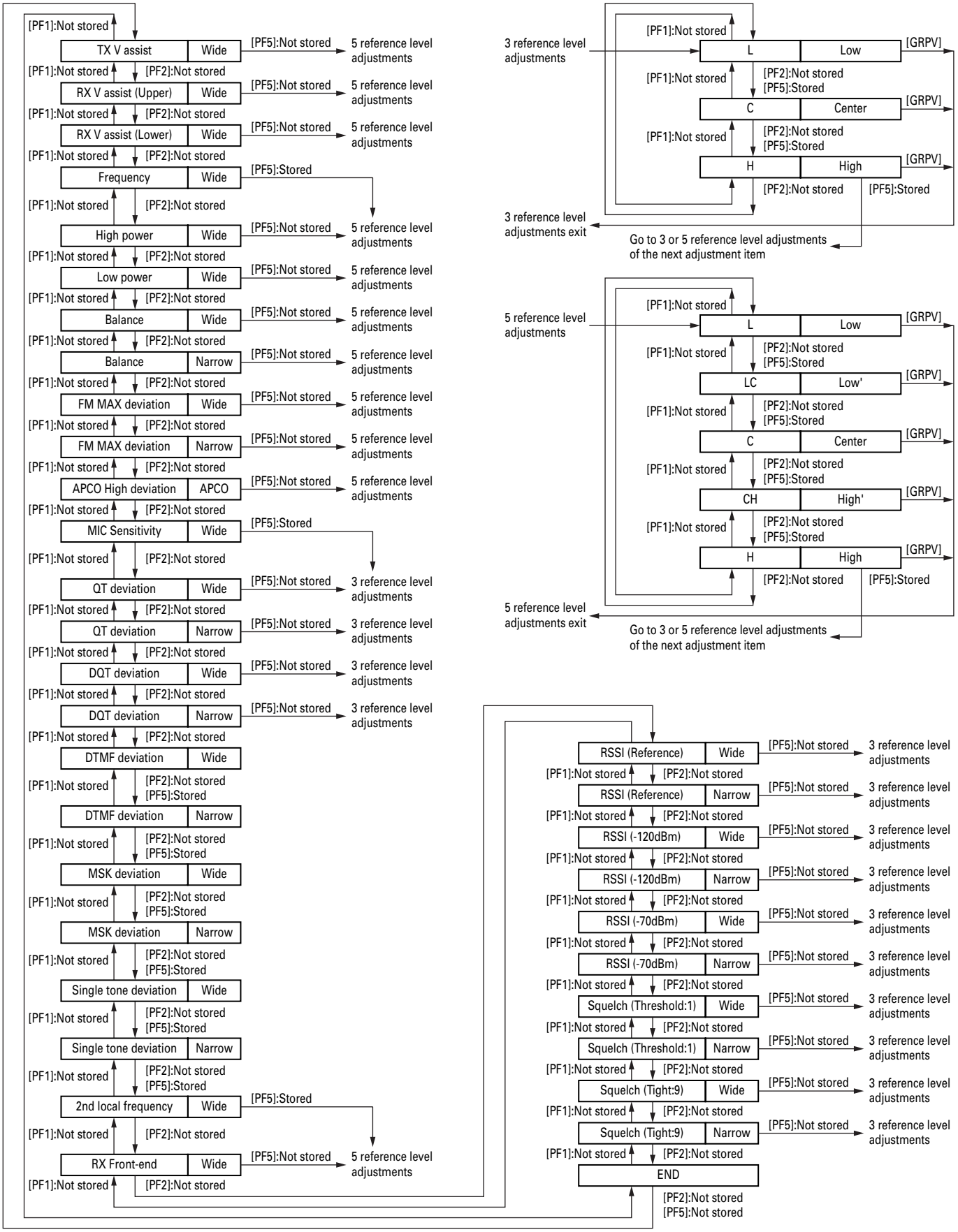
ADJUSTMENT

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

No.	Adjustment item	Display	Wide/Narrow/APCO	Tuning point	Note
1	TX assist voltage	VATX ***	Wide	5	
2	RX assist voltage (Upper)	VARX u ***	Wide	5	
3	RX assist voltage (Lower)	VARX l ***	Wide	5	
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	APCO High deviation	HDVA ***	APCO	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 (-120dBm) (Wide)	LRSI ***	Wide	3	
28	RSSI (-120dBm) (Narrow)	LRSI ***	Narrow	3	
29	RSSI (-70dBm) (Wide)	HRSI ***	Wide	3	
30	RSSI (-70dBm) (Narrow)	HRSI ***	Narrow	3	
31	Squelch (Threshold:1) (Wide)	SQOW ***	Wide	3	AF unmute
32	Squelch (Threshold:1) (Narrow)	SQON ***	Narrow	3	AF unmute
33	Squelch (Tight:9) (Wide)	SQTW ***	Wide	3	AF unmute
34	Squelch (Tight:9) (Narrow)	SQTN ***	Narrow	3	AF unmute

ADJUSTMENT

■ Flow Chart



ADJUSTMENT

BER (Bit Error Rate) Measurement

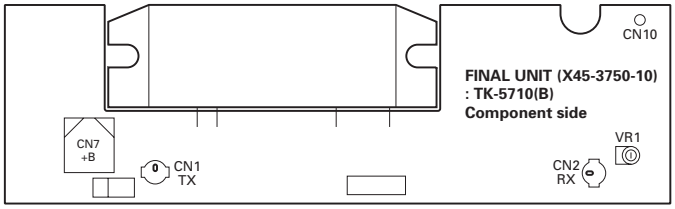
1. The Panel Test Mode is used to measure the BER (Refer to "Test mode operation features" described on page 54.).
2. Select "20" for test signaling (Refer to "Test Signaling" described on page 55.).
   When "20" is selected for the test signaling, the filter is automatically selected to "APCO".
   (If there is no RF input signal, the display shows "500000")
3. Select a filter (Refer to "Filter Mode" described on page 55.).
4. Select a test frequency (Refer to "Test Frequency" described on page 55.).

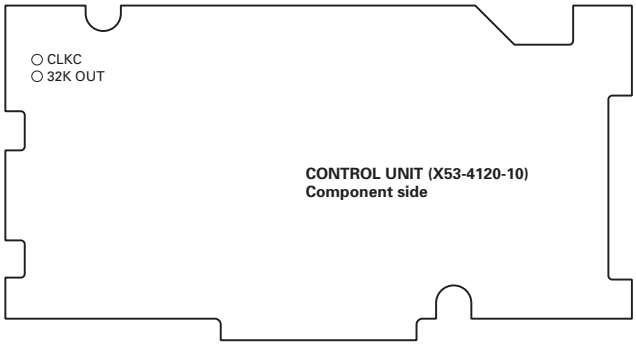
5. Measure the BER (Bit Error Rate) using the digital radio tester. Enter a standard input signal into the transceiver as a standard tone test pattern.
6. Adjust the input signal level to achieve the standard bit error rate (BER).
   (For example, if the BER is 5%, the display shows "050000".)

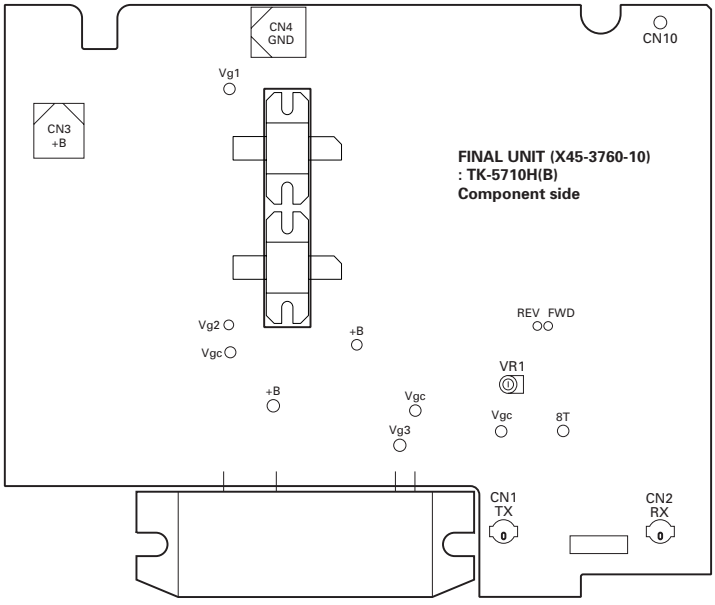
C4FM (APCO) Deviation Adjustment

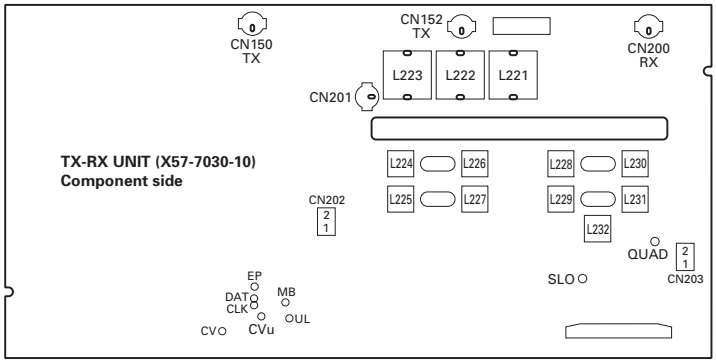
1. The transceiver adjusts the deviation between High Deviation ±1800Hz for the C4FM (APCO).
2. The Symbol Rate Pattern is used when adjusting the High Deviation for the C4FM (APCO) (Refer to "Test Signaling" described on page 55.). This test signal has a peak deviation equal to π/2 1800Hz = 2827Hz.

Adjustment Points









ADJUSTMENT

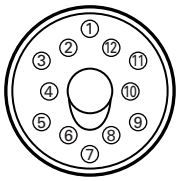
Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range	136 to 174MHz
	Modulation	Frequency modulation and external modulation
	Output	-127dBm/0.1μV to greater than -47dBm/1mV
2. Power Meter	Input Impedance	50Ω
	Operation Frequency	136 to 174MHz
	Measurement Range	Vicinity of 200W
3. Deviation Meter	Frequency Range	136 to 174MHz
4. Digital Volt Meter (DVM)	Measuring Range	1 to 20V DC
	Input Impedance	High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range	10Hz to 1000MHz
	Frequency Stability	0.2ppm or less
7. Ammeter		30A
8. AF Volt Meter (AF VTVM)	Frequency Range	50Hz to 10kHz
	Voltage Range	3mV to 3V
9. Audio Generator (AG)	Frequency Range	50Hz to 5kHz or more
	Output	0 to 1V
10. Distortion Meter	Capability	3% or less at 1kHz
	Input Level	50mV to 10Vrms
11. Spectrum Analyzer	Measuring Range	DC to 1GHz or more
12. Tracking Generator	Center frequency	50kHz to 600MHz
	Output Voltage	100mV or more
13. 4Ω Dummy Load		Approx. 4Ω, 30W
14. Regulated Power Supply		13.6V (TK-5710 (B)), 13.4V (TK-5710H (B)), approx. 30A (adjusted from 9 to 20V) Useful if ammeter equipped

Caution

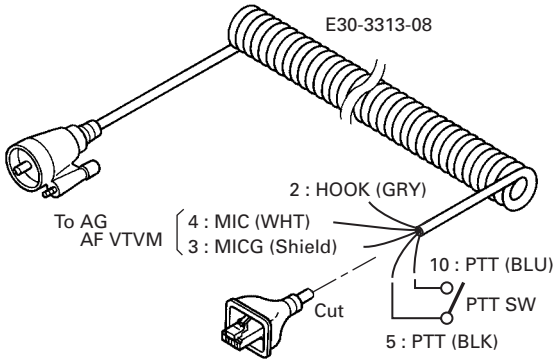
Since the RX AF output is a BTL output, there is a DC Component. Isolate this with a capacitor or transformer as shown in the figure.

MIC connector (Front view)

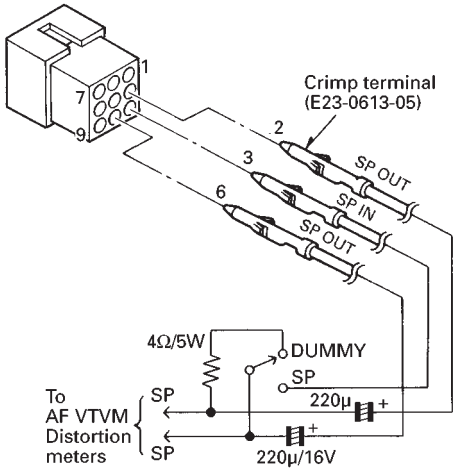


1 : SB
2 : HK
3 : ME
4 : MIC
5 : E
6 : TRD
7 : KVL
8 : DM
9 : BLC
10 : PTT
11 : NC
12 : ES2

Test cable for microphone input



Test cable for speaker output

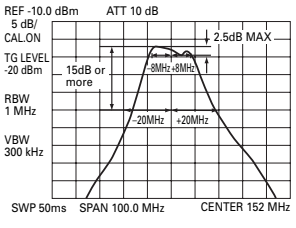


Cable for BPF or MCF adjustment

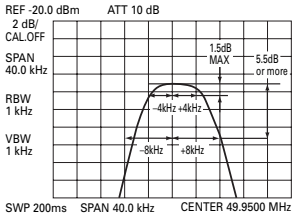
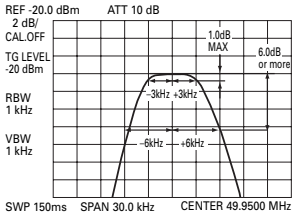
- E30-3418-05 (for BPF ADJ)
- W05-1000-00 (for MCF ADJ)

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 TK-5710(B)/5710H(B) transceiver. 2) Power supply voltage •TK-5710(B) Power input connector:13.6V •TK-5710H(B) Power input connector:13.4V 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:[L VATX]→[LC VATX]→[C VATX]→[CH VATX]→[H VATX] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.	Power meter DVM	Rear panel TX-RX	ANT CVu	Front panel	[PF3], [PF4]	Change the adjustment value within the limit of the specified voltage.	1.86V±0.1V When adjusting the assist voltage in PC tuning mode, slide the bar to indicate "VCO Lock Voltage" within 1.8V±0.1V on Meter window.
•RX(Upper)	3) Adj item:[VARX u] Adjust:[***] 4) Adj item:[L VARX u]→[LC VARX u]→[C VARX u]→[CH VARX u]→[H VARX u] Adjust:[***] Press [PF5] to store the adjustment value after adjustment.							
•RX(Lower)	5) Adj item:[VARX l] Adjust:[***] 6) Adj item:[L VARX l]→[LC VARX l]→[C VARX l]→[CH VARX l]→[H VARX l] Adjust:[***] Press [PF5] to store the adjustment value after adjustment.							
3. BPF	**[Panel test mode]** 1) CH-Sig:1-1 Spectrum analyzer setting Center-f : 152.00MHz Span : 100MHz RBW : 1MHz VBW : 300kHz TG level : -20dBm XdB/div : 5dB Connect the cable (E30-3418-05) to CN201.	Spectrum analyzer Tracking generator	Rear panel TX-RX	ANT CN201	TX-RX	L221 L222 L223	After setting the adjustment value to 110, adjust each coil to get the waveform as shown to the right. 	

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 CN203.	Spectrum analyzer Tracking generator	Rear panel TX-RX	ANT CN202 CN203	TX-RX	L225 L227 L229 L231	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					L224 L226 L228 L230		
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	L232	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) Adj item:[W TXF] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.	f.counter	Rear panel	ANT	Front panel	[PF3], [PF4]	Center frequency ±50Hz	Note:After replacing the VCXO (X200) align frequency.
2. Max power adjust •TK-5710	[Panel test mode] 1) CH-Sig:1-1 PTT:ON	Power meter Ammeter			Final	VR1	55W	±2W
•TK-5710H	1) CH-Sig:3-1 PTT:ON						118W	±2W
3. High power adjust •TK-5710	[Panel tuning mode] 1) Adj item:[W HPW] Adjust:[***] 2) Adj item:[WL HPW]→[WLC HPW]→[WC HPW]→[WCH HPW]→[WH HPW] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.				Front panel	[PF3], [PF4]	50W	±1W 12A or less
•TK-5710H							110W	±2W 25A or less
4. Low power adjust •TK-5710	1) Adj item:[W LPW] Adjust:[***] 2) Adj item:[WL LPW]→[WLC LPW]→[WC LPW]→[WCH LPW]→[WH LPW] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.						5.0W	±0.5W 5A or less
•TK-5710H							50W	±1W 12A or less
5. DQT balance adjust •Wide	1) Adj item:[W BALW] Adjust:[***] Deviation meter filter LPF:3kHz HPF:OFF 2) Adj item:[WL BALW]→[WLC BALW]→[WC BALW]→[WCH BALW]→[WH BALW] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.	Deviation meter Oscilloscope AG AF VTVM	Rear panel Front panel	ANT MIC jack	Front panel	[PF3], [PF4]	Make the demodulation waves into square waves.	
•Narrow	3) Adj item:[N BALN] Adjust:[***] 4) Adj item:[NL BALN]→[NLC BALN]→[NC BALN]→[NCH BALN]→[NH BALN] Adjust:[***] PTT:ON Press [PF5] to store the adjustment value after adjustment.							

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 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.	Deviation meter Oscilloscope AG AF VTVM	Rear panel Front panel	ANT MIC jack	Front panel	[PF3], [PF4]	4.05kHz (According to the large +, –)	±50Hz
•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.						2.0kHz (According to the large +, –)	±50Hz
7. APCO 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	[Panel test mode] 1) CH-Sig:1-1 AG:1kHz/5mV at MIC terminal PTT:ON	Power meter Ammeter	Rear panel	ANT			Check	2.75~3.25kHz

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 Oscilloscope AG AF VTVM	Rear panel Front panel	ANT MIC jack	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.						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 Front panel	ANT MIC jack	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]	SSG	Rear panel	ANT	Front panel	[PF3], [PF4]	Enter the following adjustment values to the transceiver by pressing [PF3] and [PF4] keys. [WL FEND] : 190 [WLC FEND] : 160 [WC FEND] : 110 [WCH FEND] : 65 [WH FEND] : 10 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)							
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)							
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)							
•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)							
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

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
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							
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)				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 +6dB (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 (X45-3750-10): TK-5710(B)

Pin No.	Name	I/O	Description
CN1 (to TX-RX unit CN150)			
1	TX	I	TX drive input
CN2 (to TX-RX unit CN200)			
1	RX	O	RX signal output
CN7 (to DC cable)			
1	+B	I	Power supply input (13.6V±15%)
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
W2 (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%)

Final unit (X45-3760-10): TK-5710H(B)

Pin No.	Name	I/O	Description
CN1 (to TX-RX unit CN152)			
1	TX	I	TX drive input
CN2 (to TX-RX unit CN200)			
1	RX	O	RX signal output
CN3 (to DC cable)			
1	+B	I	Power supply input (13.4V±15%)
CN4 (to DC cable)			
1	E	–	GND
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
W2 (to Control unit CN702)			
1	E	–	GND
2	+B	O	Power supply output (13.4V±15%)
3	+B	O	Power supply output (13.4V±15%)

Control unit (X53-4120-10)

Pin No.	Name	I/O	Description
CN702 (to TK-5710(B) or TK-5710H(B) Final unit W2)			
1	+B	I	Power supply input (TK-5710(B):13.6V/ TK-5710H(B):13.4V)
2	+B	I	Power supply input (TK-5710(B):13.6V/ TK-5710H(B):13.4V)
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 (TK-5710(B):13.6V/ TK-5710H(B):13.4V)
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

TERMINAL FUNCTION

Pin No.	Name	I/O	Description
6	EN	O	Enable output (Active Low)
7	USEL	O	UART speed select (H:115200bps, L:19200bps)
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≦0.4V, H≧4.6V / 30kΩ load
2	AKEY	I	TX Control signal input (Active Low) L≦0.8V, H≧2.6V
3~5	NC	–	No connection
6	PTOA	O	PTT signal output (L:PTT ON) L≦0.4V, H≧4.6V / 30kΩ load
7	NC	–	No connection
8	EMG	O	Emergency signal output (L:Operated) L≦0.4V, H≧4.6V / 30kΩ 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≦0.8V, H≧4.2V
18	NC	–	No connection
19	AINH	I	MIC mute signal input (L:Mute) L≦0.8V, H≧4.2V
20	AUX I/O	I	Emergency signal input (Active Low) L≦0.8V, H≧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≦0.4V, H≧4.6V / 30kΩ load
2	BC2	O	Scramble code signal output 2 L≦0.4V, H≧4.6V / 30kΩ load
3	LOK	–	No connection
4	PTOS	O	TX signal output (L:TX) L≦0.4V, H≧4.6V / 30kΩ load
5	NC	–	No connection
6	ECHO	I/O	Echo PTT
7	NC	–	No connection
8	BC4	O	Scramble code signal output 4 L≦0.4V, H≧4.6V / 30kΩ load

Pin No.	Name	I/O	Description
9,10	E	–	GND
11,12	NC	–	No connection
13	E	–	GND
14	5C	–	Common 5V
15~19	NC	–	No connection
20	AC	O	Scramble control signal output (L:On, H:Off)L≦0.4V, H≧4.6V / 30kΩ load
21	TXO	O	MIC signal output Zo≦1kΩ (85mVp-p typ.)
22	RXEO	O	AUDIO signal output Zo≦100Ω (1.2Vp-p typ.)
23	RXEI	I	AUDIO signal input Zi=27kΩ (1.2Vp-p typ.)
24	STXI	I	MIC signal input Zo=100kΩ
25	BC3	O	Scramble code signal output 3 L≦0.4V, H≧4.6V / 30kΩ 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.)

TERMINAL FUNCTION

Pin No.	Name	I/O	Description
4	HR2	O	Horn alert signal output 2 (1A max.)
5	OS2	O	BTL output for external speaker B (PA)
6	OS1	O	BTL output for external speaker B (PA)
7	ES2	O	BTL output for external speaker A
8	ES1	O	BTL output for external speaker A
9	IRS	I	Remote speaker switch
W700 (to Display unit CN1)			
1	ES2	O	Remote speaker output
2	IRS	O	Remote speaker output
3	SB	O	Switched B (TK-5710(B):13.6V/ TK-5710H(B):13.4V)
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

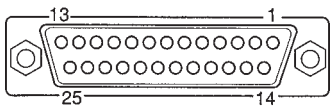
TX-RX unit (X57-7030-10)

Pin No.	Name	I/O	Description
CN150 (to TK-5710(B) Final unit CN1)			
1	TX	O	TX drive output for TK-5710(B)
CN152 (to TK-5710H(B) Final unit CN1)			
1	TX	O	TX drive output for TK-5710H(B)
CN200 (to TK-5710(B) or TK-5710H(B) Final unit CN2)			
1	RX	I	RX signal input
CN201 (for BPF Adjustment)			
1	BPFout	O	BPF output
2	E	–	GND
CN202 (for MCF Adjustment)			
1	MCFin	I	MCF input
2	E	–	GND
CN203 (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
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 TK-5710(B) or TK-5710H(B) 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

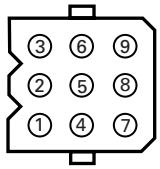
D-SUB 25-pin connector

Pin No.	Name	I/O	Description
1	NC	–	No connection
2	RXD2	I	Serial data input 2 RS-232C level (±30V max.) L≦0.4V, H≧2.4V, Zi≧5kΩ
3	TXD2	O	Serial data output 2 RS-232C level L≦-5V, H≧5V / 3kΩ load, Zo≦2kΩ
4	AUX I/O 9	I/O	Auxiliary input/output 9 (FPU selectable) Active Low with 47kΩ pull-up to 5V L≦0.8V, H≧4.2V
5	DI	I	Data signal input Zi≧10kΩ 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 Zi=600Ω Deviation:60% deviation (at 1kHz/ 5mV±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 47kΩ pull-up to 5V L≦0.8V, H≧4.2V

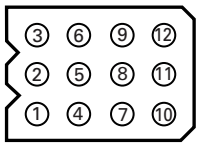
TERMINAL FUNCTION

Pin No.	Name	I/O	Description
9	TXD3	O	Serial data output 3 CMOS Level L≦0.7V, H≧4.2V / 25kΩ load, Zo≦1kΩ
10	RXD3	I	Serial data input 3 CMOS Level 0-5V max. L≦0.8V, H≧4.2V
11	E	–	GND
12	AUX I/O 7	I/O	Auxiliary input/output 7 (FPU selectable) Active Low with 47kΩ pull-up to 5V L≦0.8V, H≧4.2V
13	AUX I/O 6	I/O	Auxiliary Input/output 6 (FPU selectable) Active Low with 47kΩ pull-up to 5V L≦0.8V, H≧4.2V
14	SB	I	Switched B (TK-5710(B):13.6V±15% / TK-5710H(B):13.4V±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 Zo≦1kΩ 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
19	DEO	O	Detected signal output Zo≦600kΩ 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 47kΩ pull-up to 5V L≦0.8V, H≧4.2V
21	AUX I/O 4	I/O	Auxiliary input/output 4 (FPU selectable) Active Low with 47kΩ pull-up to 5V L≦0.8V, H≧4.2V
22	AUX I/O 3	I/O	Auxiliary input/output 3 (FPU selectable) Active Low with 47kΩ pull-up to 5V L≦0.8V, H≧4.2V
23	AUX I/O 2	I/O	Auxiliary input/output 2 (FPU selectable) Active Low with 47kΩ pull-up to 5V L≦0.8V, H≧4.2V
24	AUX I/O 1	I/O	Auxiliary input/output 1 (FPU selectable) Active Low with 47kΩ pull-up to 5V L≦0.8V, H≧4.2V
25	ME	–	MIC GND 

Accessory 9-pin connector

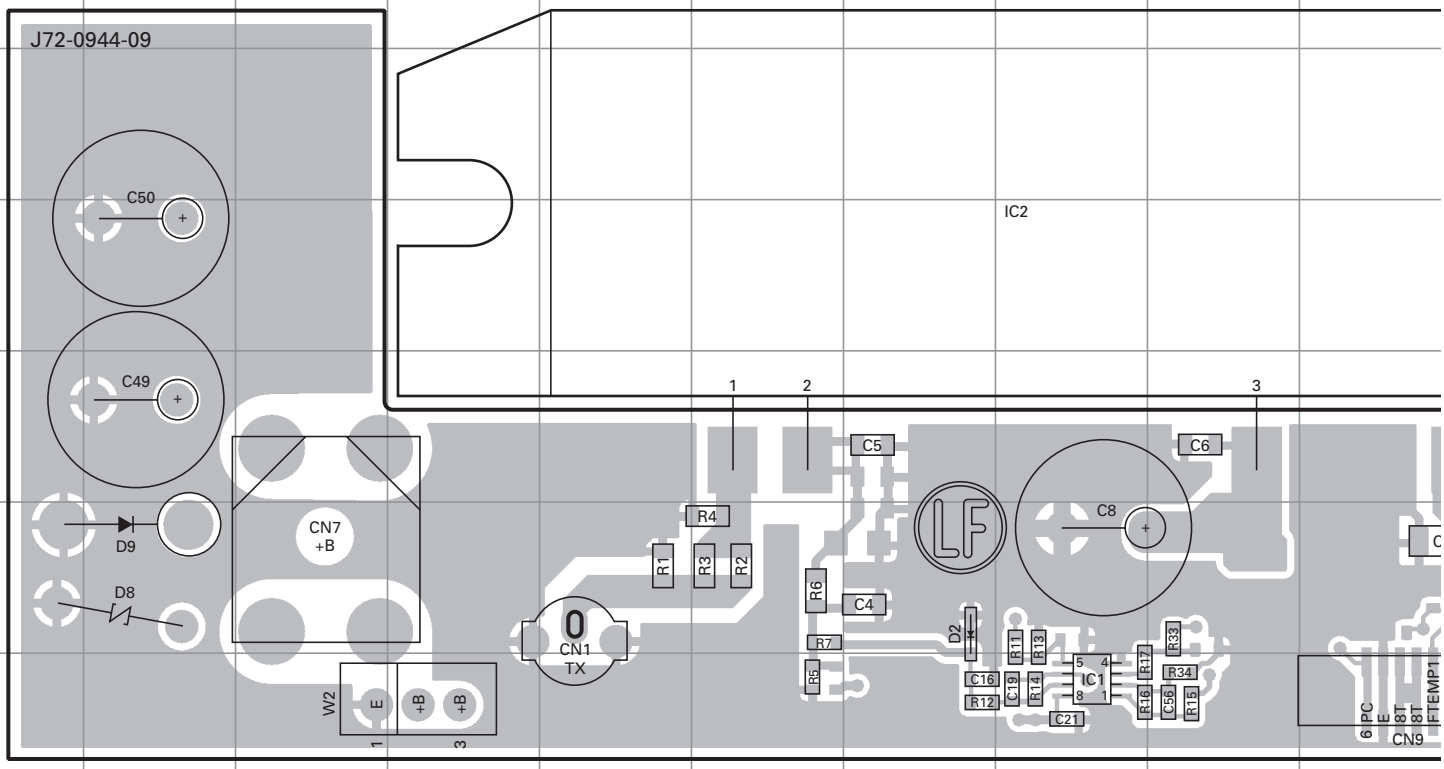
Pin No.	Name	I/O	Description
1	IGN	I	Ignition sense input
2	ES2	O	BTL output for external speaker A
3	RS1	I	Remote speaker switch
4	HR1	O	Horn alert signal output 1 (1A max.)
5	HR2	O	Horn alert signal output 2 (1A max.)
6	ES1	O	BTL output for external speaker A
7	OS1	O	BTL output for external speaker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

Accessory 12-pin connector (Remote kit)

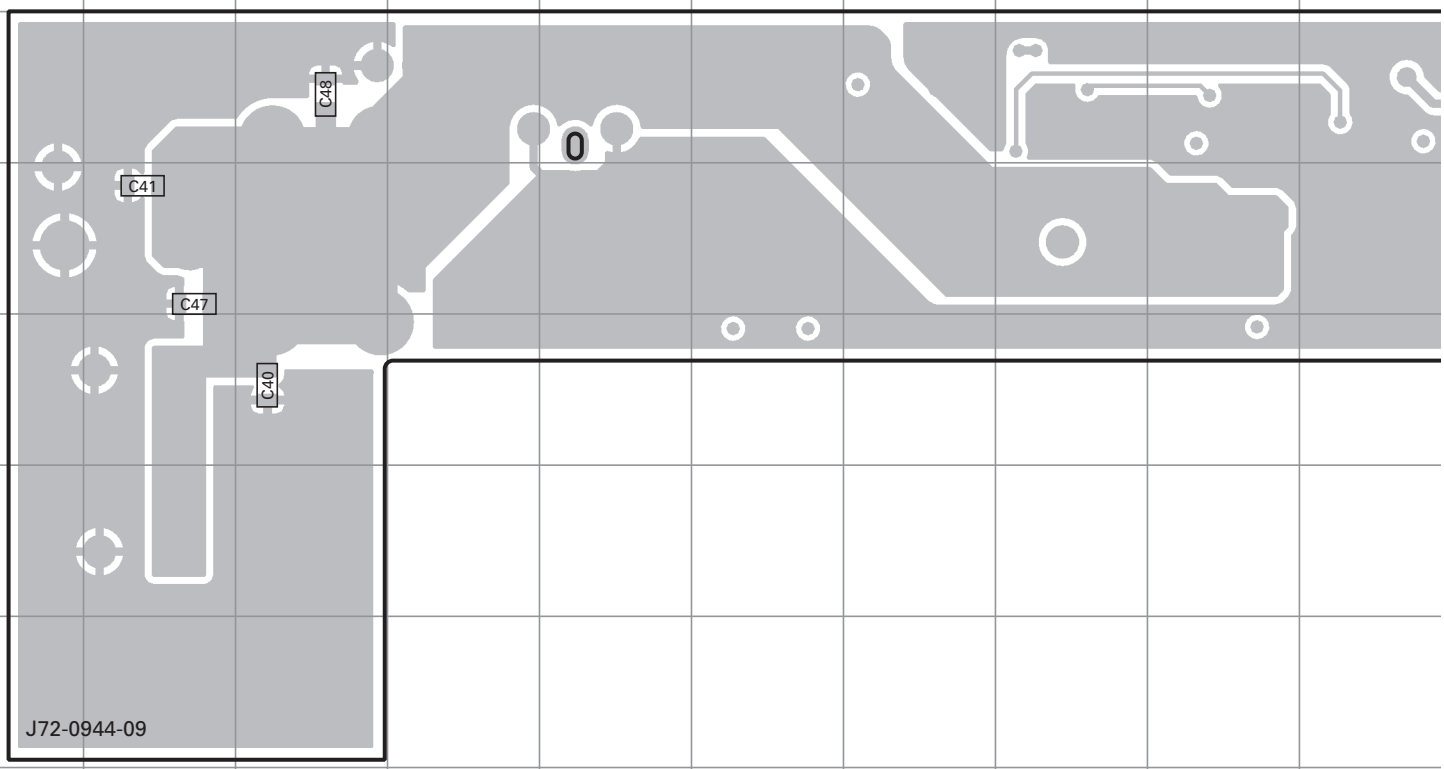
Pin No.	Name	I/O	Description
1	IGN	I	Ignition sense input
2	SB	O	Switched B (TK-5710(B):13.6V±15% / TK-5710H(B):13.4V±15%)
3	E	–	GND
4	MIC	I	MIC signal input / 60% deviation at 1kHz/5mV±2mV input
5	ME	–	MIC GND
6	AI1	I	Auxiliary input 1 (FPU selectable)
7	AI2	I	Auxiliary input 2 (FPU selectable)
8	AO1	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-5710(B)/5710H(B) PC BOARD

FINAL UNIT (X45-3750-10) : TK-5710(B)
Component side view (J72-0944-09)

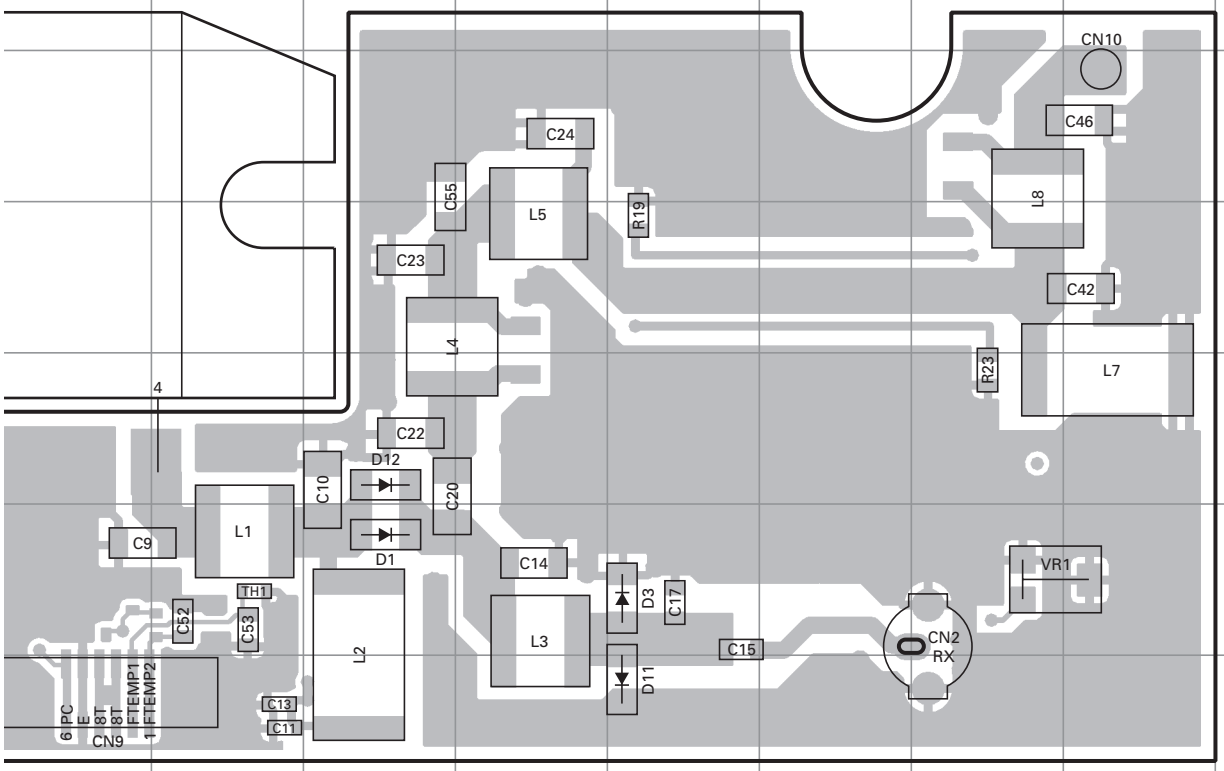


FINAL UNIT (X45-3750-10) : TK-5710(B)
Foil side view (J72-0944-09)



PC BOARD TK-5710(B)/5710H(B)

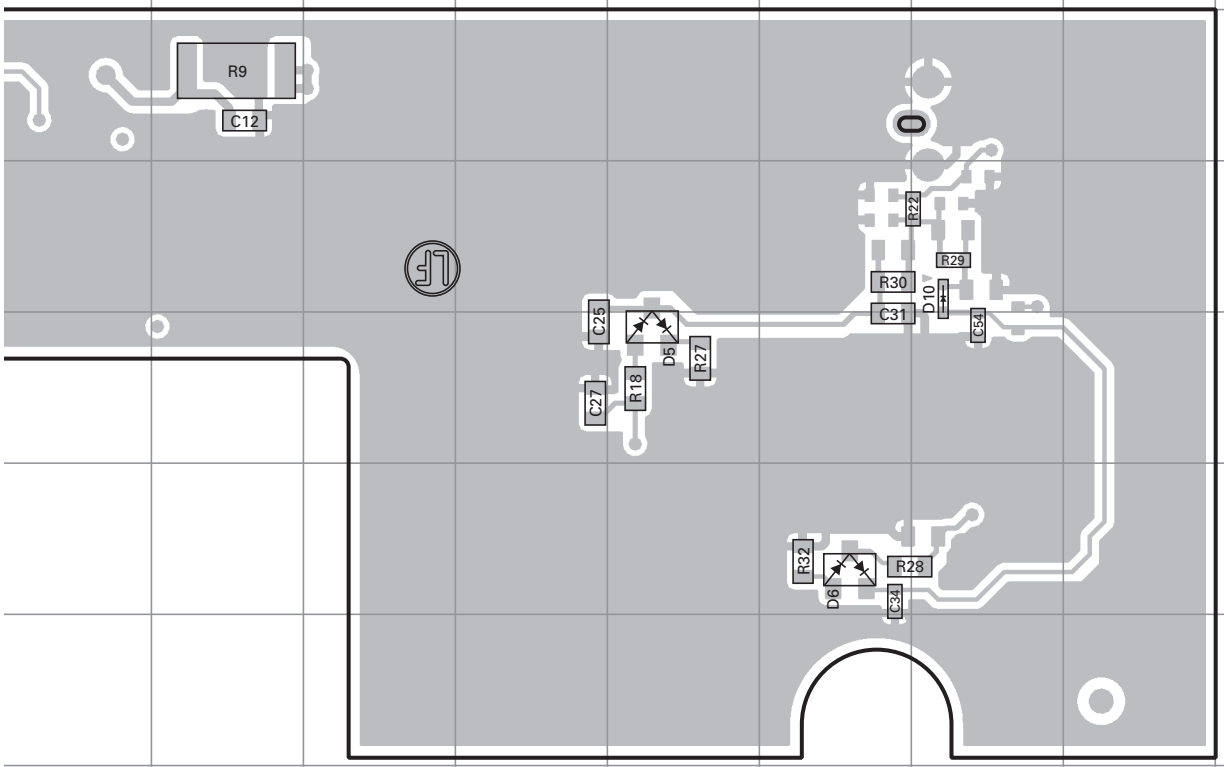
FINAL UNIT (X45-3750-10) : TK-5710(B)
Component side view (J72-0944-09)



Ref. No.	Address
IC1	7H
IC2	4H
D1	6L
D2	6G
D3	6N
D8	6B
D9	6B
D11	7N
D12	5L

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

FINAL UNIT (X45-3750-10) : TK-5710(B)
Foil side view (J72-0944-09)

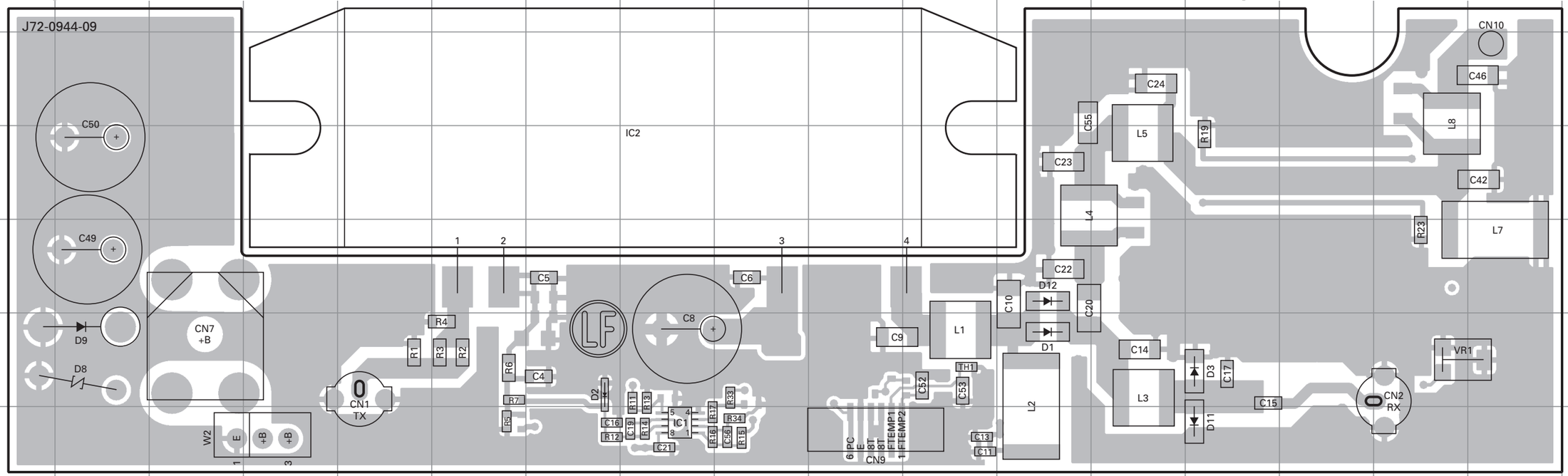


Ref. No.	Address
D5	11N
D6	12O
D10	10P

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

PC BOARD TK-5710(B)/5710H(B)

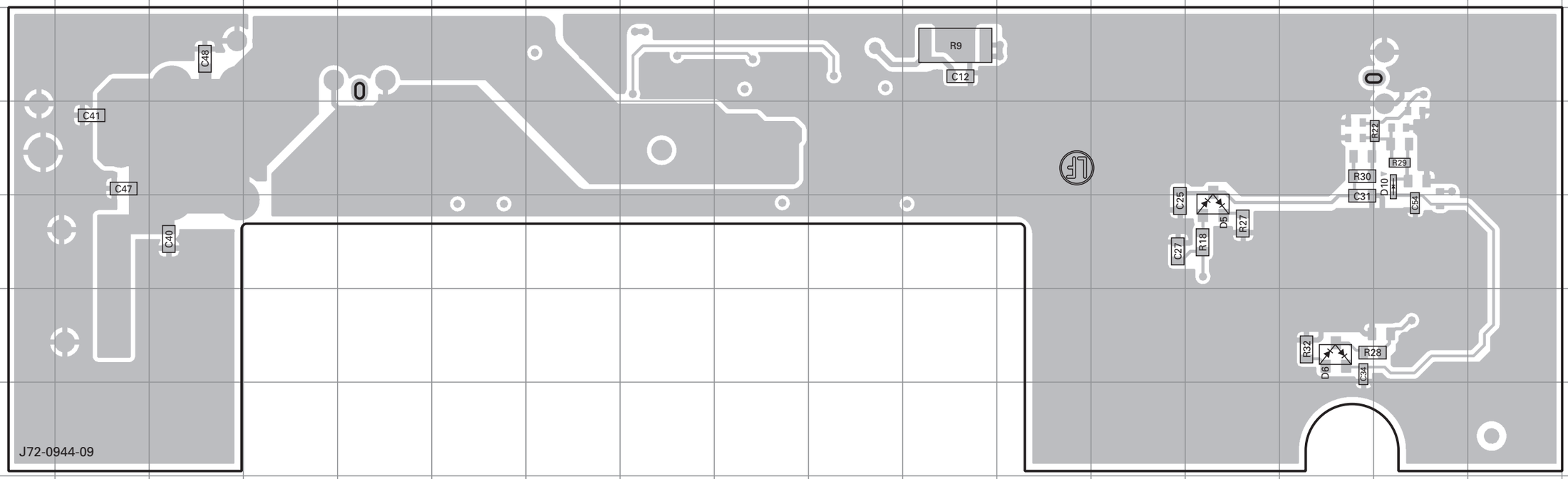
FINAL UNIT (X45-3750-10) : TK-5710(B)
Component side view (J72-0944-09)



Ref. No.	Address
IC1	7H
IC2	4H
D1	6L
D2	6G
D3	6N
D8	6B
D9	6B
D11	7N
D12	5L

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

FINAL UNIT (X45-3750-10) : TK-5710(B)
Foil side view (J72-0944-09)



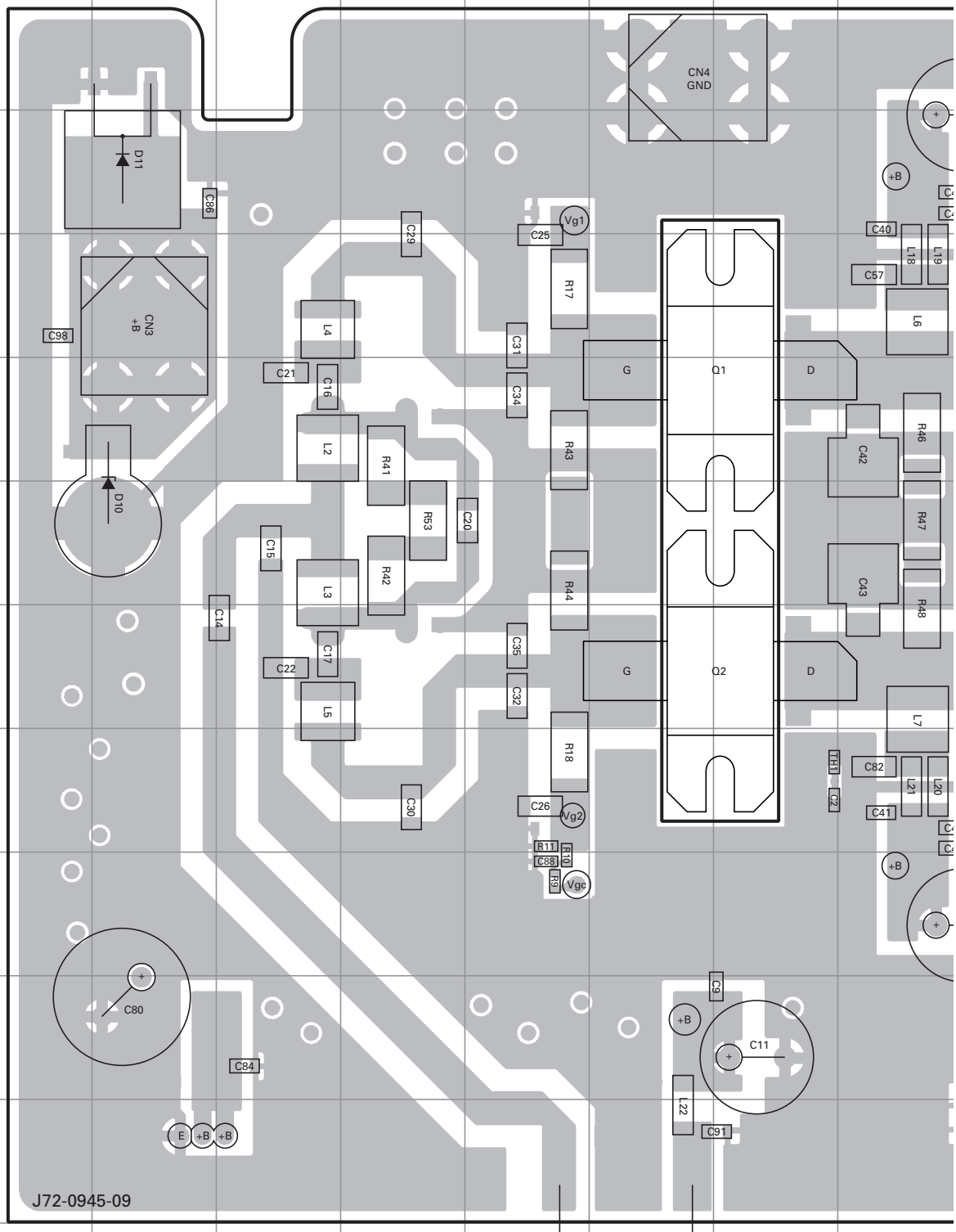
Ref. No.	Address
D5	11N
D6	12O
D10	10P

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

TK-5710(B)/5710H(B) PC BOARD

FINAL UNIT (X45-3760-10) : TK-5710H(B)

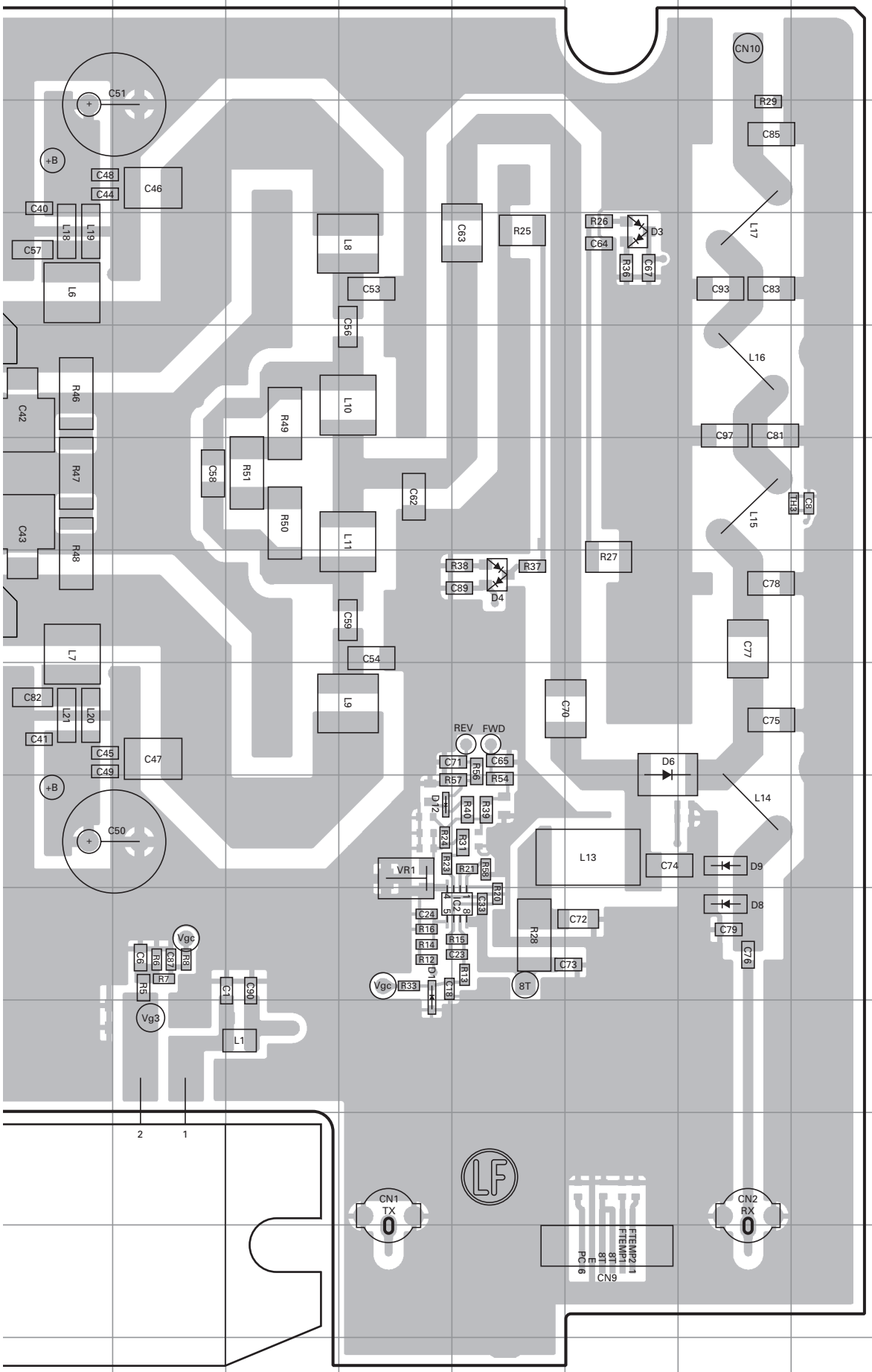
Component side view (J72-0945-09)



PC BOARD TK-5710(B)/5710H(B)

FINAL UNIT (X45-3760-10) : TK-5710H(B)

Component side view (J72-0945-09)



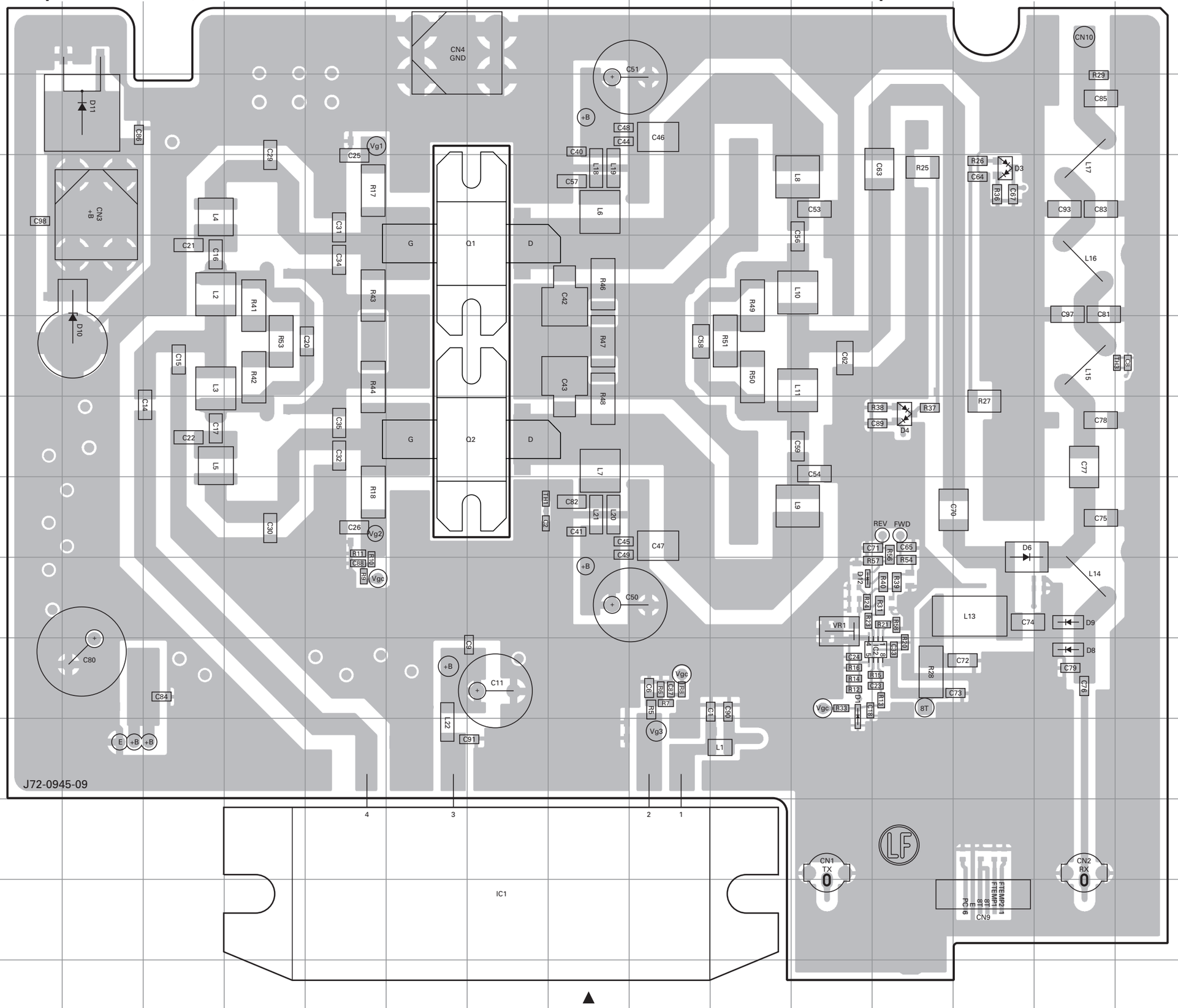
Ref. No.	Address
IC1	13I
IC2	10N
Q1	5I
Q2	7I
D1	10M
D3	4O
D4	7N
D6	8O
D8	9P
D9	10P
D10	6D
D11	3D
D12	9M

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

TK-5710(B)/5710H(B) PC BOARD

FINAL UNIT (X45-3760-10) : TK-5710H(B)
Component side view (J72-0945-09)

TK-5710(B)/5710H(B) PC BOARD
FINAL UNIT (X45-3760-10) : TK-5710H(B)
Component side view (J72-0945-09)



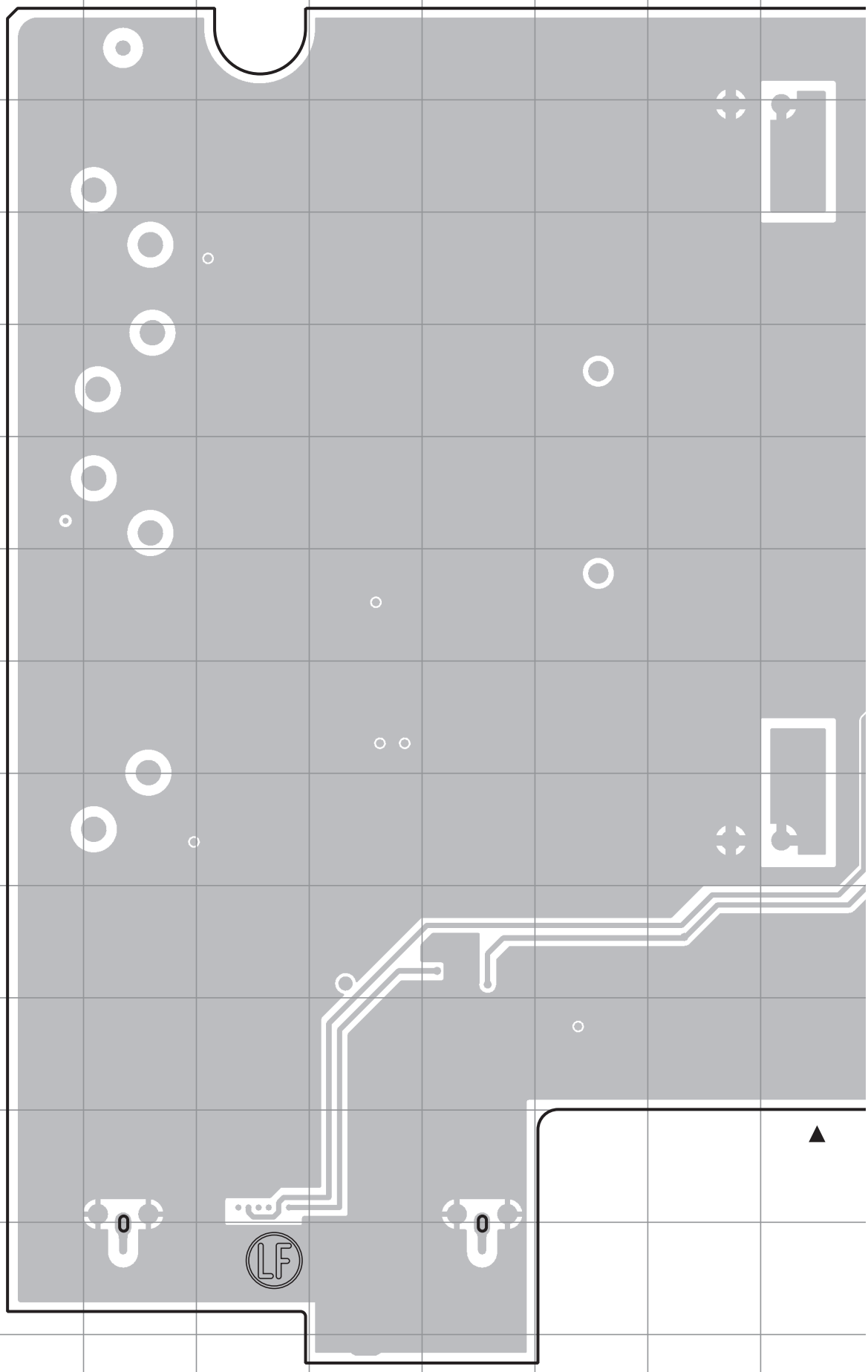
Ref. No.	Address
IC1	13I
IC2	10N
Q1	5I
Q2	7I
D1	10M
D3	4O
D4	7N
D6	8O
D8	9P
D9	10P
D10	6D
D11	3D
D12	9M

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

TK-5710(B)/5710H(B) PC BOARD

FINAL UNIT (X45-3760-10) : TK-5710H(B)

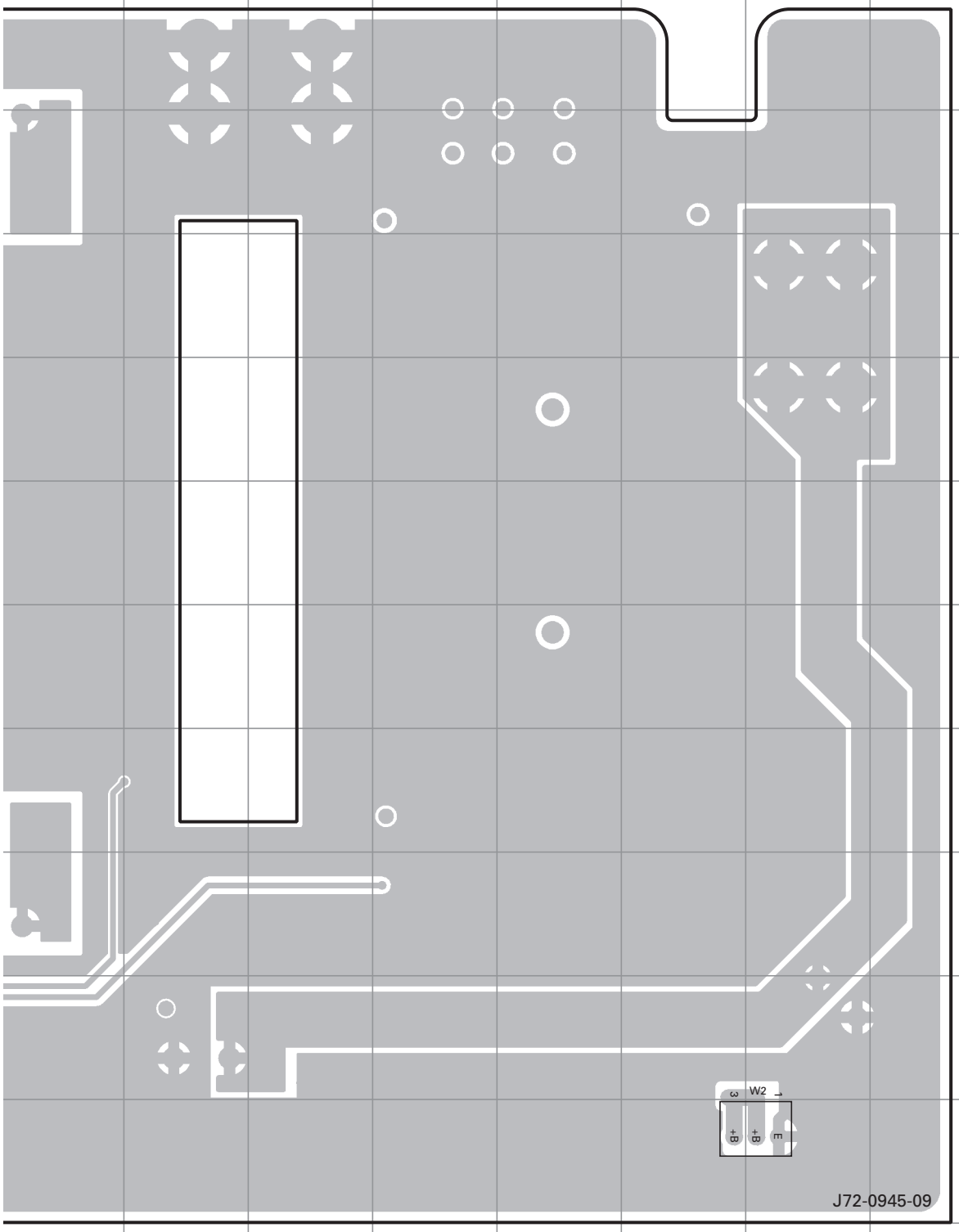
Foil side view (J72-0945-09)



PC BOARD TK-5710(B)/5710H(B)

FINAL UNIT (X45-3760-10) : TK-5710H(B)

Foil side view (J72-0945-09)



Component side

Layer 1

Layer 2

Layer 3

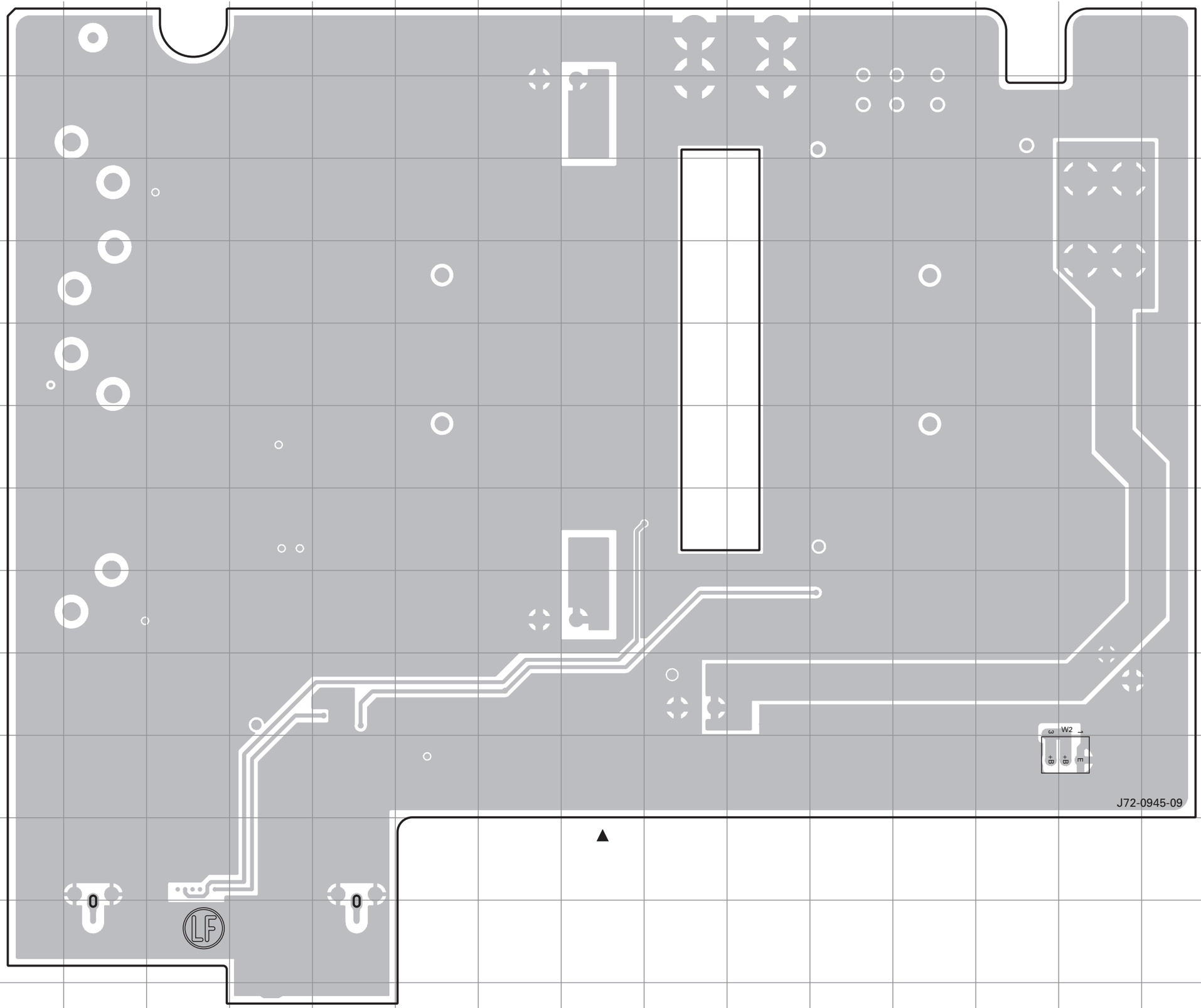
Layer 4

Foil side

TK-5710(B)/5710H(B) PC BOARD

FINAL UNIT (X45-3760-10) : TK-5710H(B)
Foil side view (J72-0945-09)

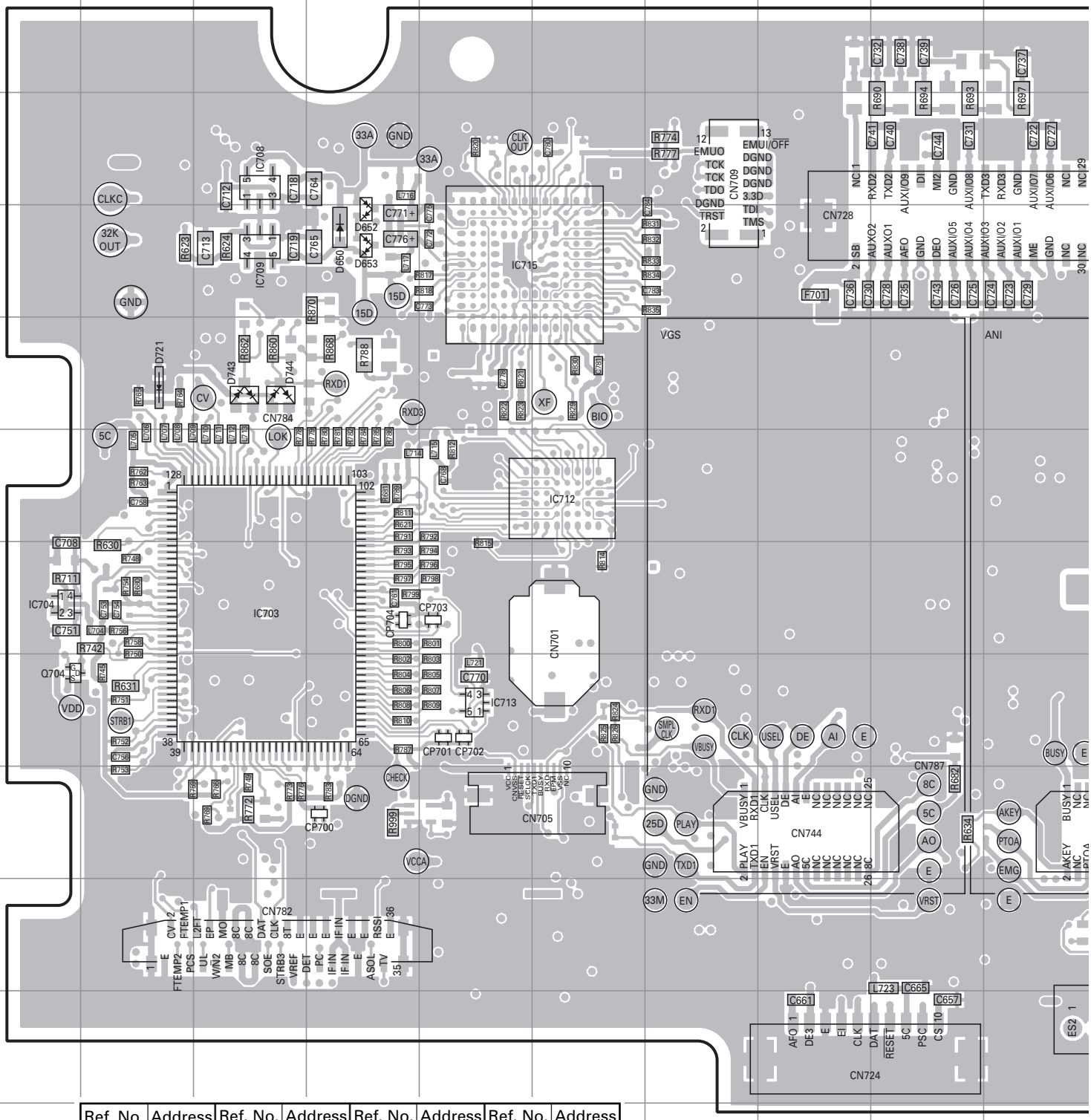
PC BOARD TK-5710(B)/5710H(B)
FINAL UNIT (X45-3760-10) : TK-5710H(B)
Foil side view (J72-0945-09)



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

TK-5710(B)/5710H(B) PC BOARD

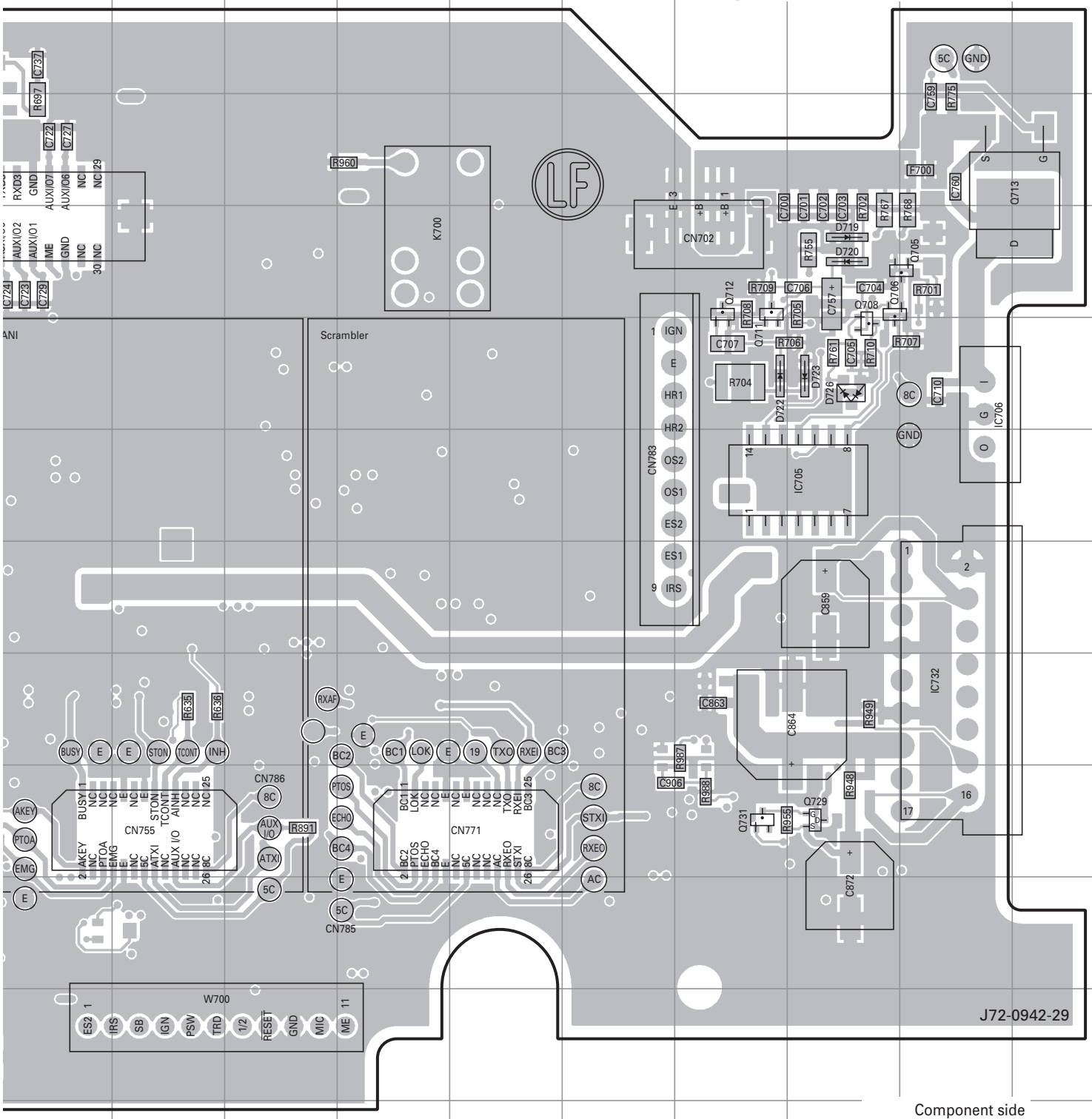
CONTROL UNIT (X53-4120-10)
Component side view (J72-0942-29)



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

PC BOARD TK-5710(B)/5710H(B)

CONTROL UNIT (X53-4120-10)
Component side view (J72-0942-29)

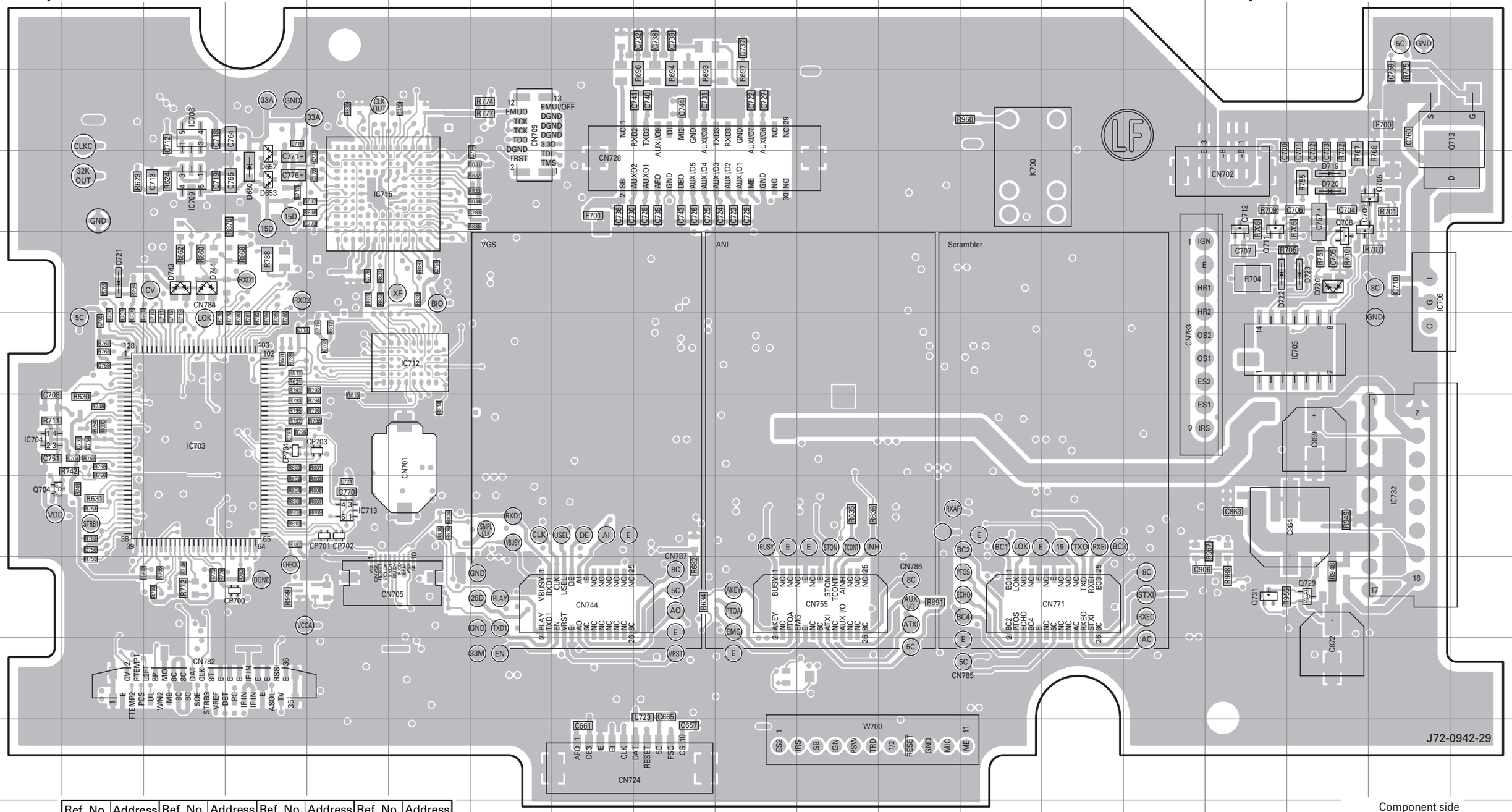


Component side
Layer 1
Layer 2
Layer 3
Layer 4
Layer 5
Layer 6
Foil side

CONTROL UNIT (X53-4120-10)
Component side view (J72-0942-29)

PC BOARD TK-5710(B)/5710H(B)

CONTROL UNIT (X53-4120-10)
Component side view (J72-0942-29)



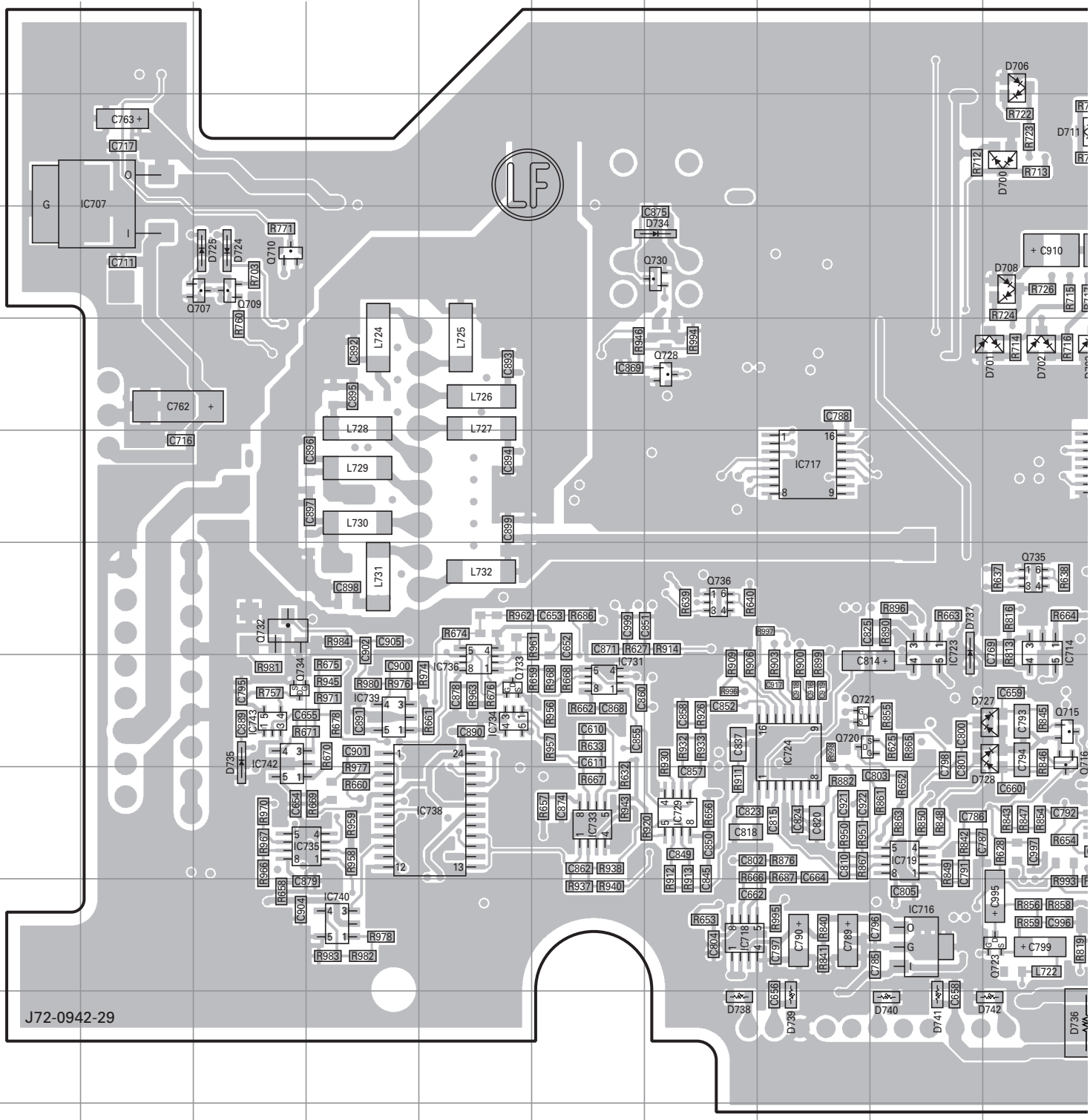
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC703	7C	IC715	4E	Q713	3S	D721	5B
IC704	7A	IC732	8R	Q729	9Q	D722	5P
IC705	6Q	Q704	8A	Q731	9P	D723	5Q
IC706	5R	Q705	4R	D650	4D	D726	5Q
IC708	3C	Q706	4Q	D652	4D	D743	5C
IC709	4C	Q708	5Q	D653	4D	D744	5C
IC712	6F	Q711	4P	D719	4Q		
IC713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

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

TK-5710(B)/5710H(B) PC BOARD

CONTROL UNIT (X53-4120-10)

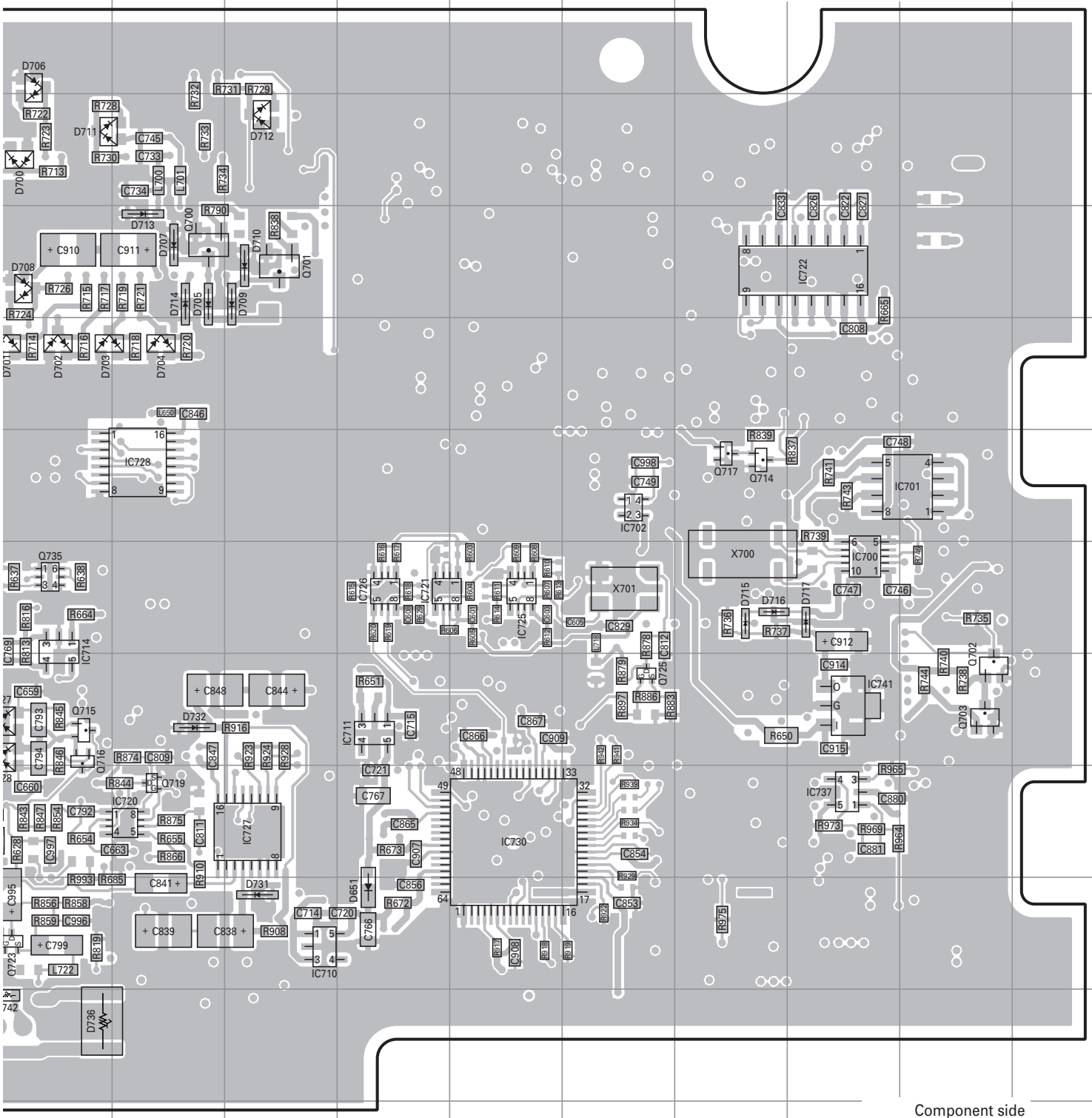
Foil side view (J72-0942-29)



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	Q701	4L	Q715	8J	Q725	8O
IC701	6R	IC717	6H	IC724	8H	IC731	8F	IC739	8D	Q702	8R	Q716	8J	Q728	5G
IC702	6O	IC718	10G	IC725	7N	IC733	9F	IC740	10D	Q703	8R	Q717	6P	Q730	4G
IC707	3B	IC719	9I	IC726	7M	IC734	8E	IC741	8Q	Q707	4C	Q719	9K	Q732	7C
IC710	10L	IC720	9K	IC727	9L	IC735	9D	IC742	8C	Q709	4C	Q720	8H	Q733	8E
IC711	8M	IC721	7M	IC728	6K	IC736	8E	IC743	8C	Q710	4C	Q721	8H	Q734	8C
IC714	7J	IC722	4Q	IC729	9G	IC737	9Q	Q700	4K	Q714	6P	Q723	10J	Q735	7J

PC BOARD TK-5710(B)/5710H(B)

CONTROL UNIT (X53-4120-10)
Foil side view (J72-0942-29)



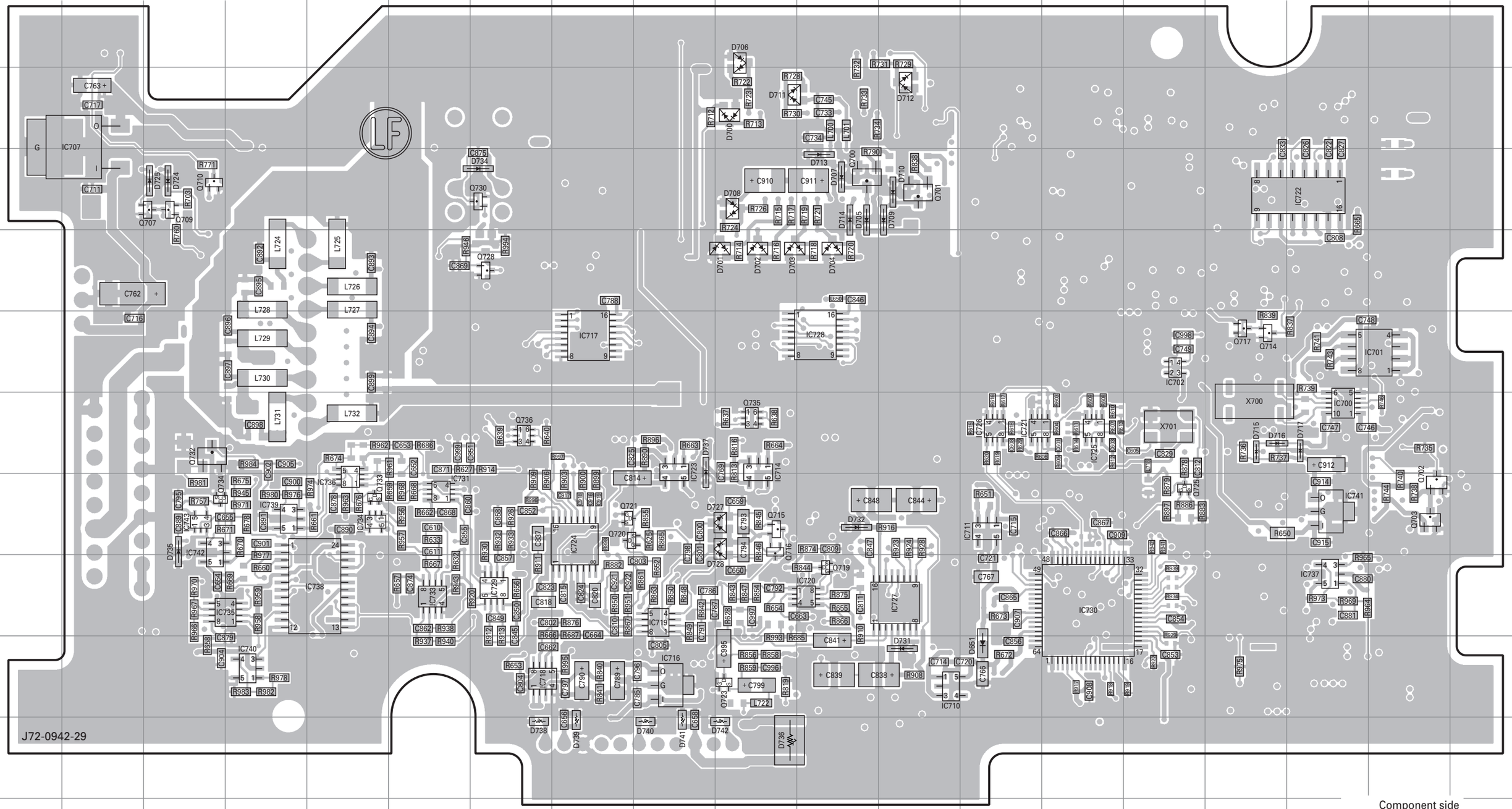
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
Q736	7G	D705	4K	D712	3L	D725	4C	D736	11J
D651	10M	D706	2J	D713	4K	D727	8J	D737	7I
D700	3J	D707	4K	D714	4K	D728	8J	D738	11G
D701	5J	D708	4J	D715	7P	D731	10L	D739	11H
D702	5J	D709	4L	D716	7P	D732	8K	D740	11I
D703	5J	D710	4L	D717	7Q	D734	4G	D741	11I
D704	5K	D711	3J	D724	4C	D735	8C	D742	11J

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

PC BOARD TK-5710(B)/5710H(B)

CONTROL UNIT (X53-4120-10)
Foil side view (J72-0942-29)

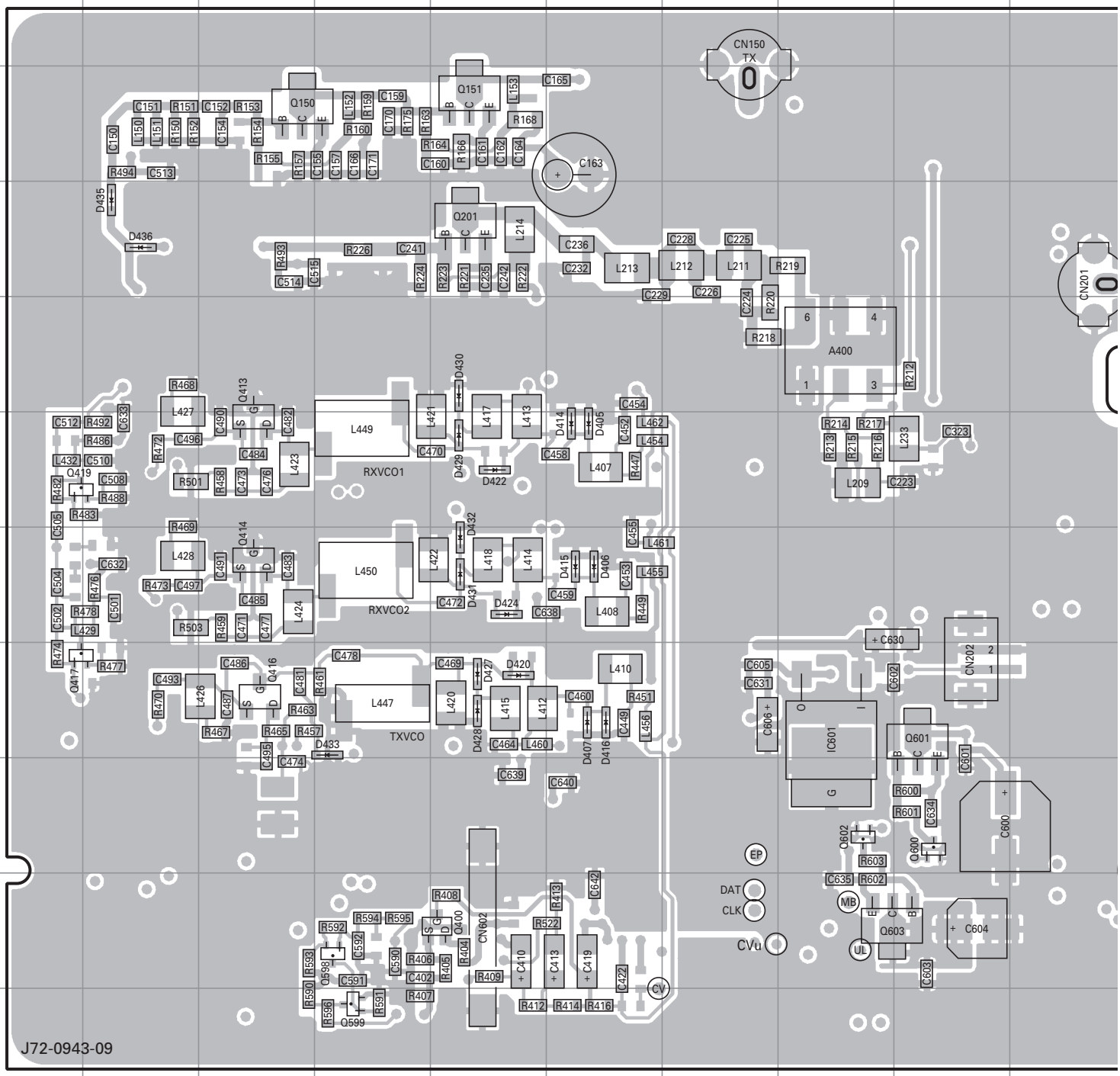
CONTROL UNIT (X53-4120-10)
Foil side view (J72-0942-29)



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	Q701	4L	Q715	8J	Q725	8O	Q736	7G	D705	4K	D712	3L	D725	4C	D736	11J
IC701	6R	IC717	6H	IC724	8H	IC731	8F	IC739	8D	Q702	8R	Q716	8J	Q728	5G	D651	10M	D706	2J	D713	4K	D727	8J	D737	7I
IC702	6O	IC718	10G	IC725	7N	IC733	9F	IC740	10D	Q703	8R	Q717	6P	Q730	4G	D700	3J	D707	4K	D714	4K	D728	8J	D738	11G
IC707	3B	IC719	9I	IC726	7M	IC734	8E	IC741	8Q	Q707	4C	Q719	9K	Q732	7C	D701	5J	D708	4J	D715	7P	D731	10L	D739	11H
IC710	10L	IC720	9K	IC727	9L	IC735	9D	IC742	8C	Q709	4C	Q720	8H	Q733	8E	D702	5J	D709	4L	D716	7P	D732	8K	D740	11I
IC711	8M	IC721	7M	IC728	6K	IC736	8E	IC743	8C	Q710	4C	Q721	8H	Q734	8C	D703	5J	D710	4L	D717	7Q	D734	4G	D741	11I
IC714	7J	IC722	4Q	IC729	9G	IC737	9Q	Q700	4K	Q714	6P	Q723	10J	Q735	7J	D704	5K	D711	3J	D724	4C	D735	8C	D742	11J

TK-5710(B)/5710H(B) PC BOARD

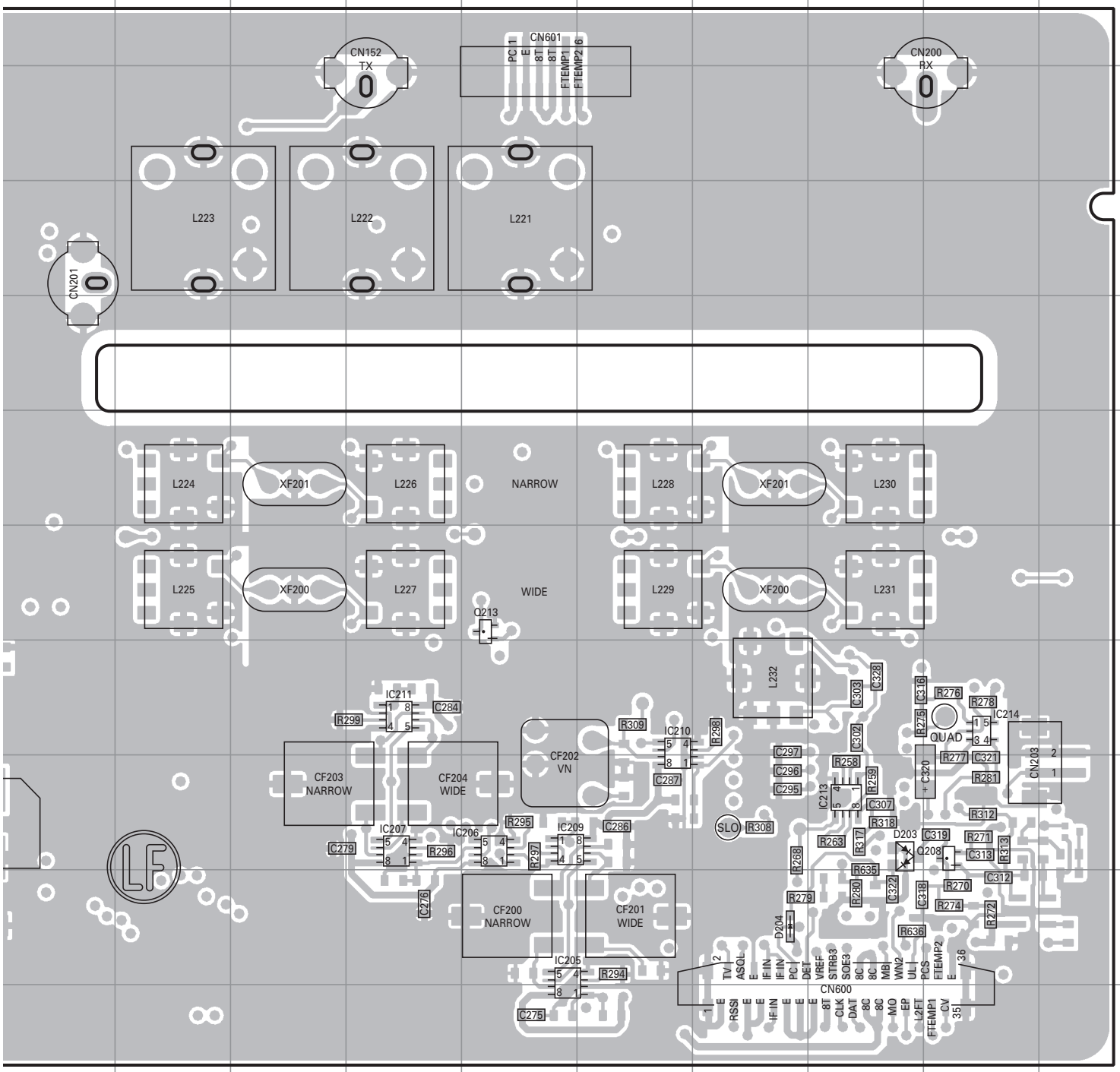
TX-RX UNIT (X57-7030-10)
Component side view (J72-0943-09)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC205	10N	IC601	8H	Q414	7C	Q602	9H	D415	7F	D430	5E
IC206	9N	Q150	3C	Q416	8C	Q603	10H	D416	8F	D431	7E
IC207	9M	Q151	3E	Q417	8A	D203	9Q	D420	8E	D432	7E
IC209	9N	Q201	4E	Q419	6A	D204	10P	D422	6E	D433	8D
IC210	8O	Q208	9R	Q598	10D	D405	6F	D424	7E	D435	4B
IC211	8M	Q213	7N	Q599	11D	D406	7F	D427	8E	D436	4B
IC213	9Q	Q400	10E	Q600	9I	D407	8F	D428	8E		
IC214	8R	Q413	6C	Q601	8I	D414	6F	D429	6E		

PC BOARD TK-5710(B)/5710H(B)

TX-RX UNIT (X57-7030-10)
Component side view (J72-0943-09)

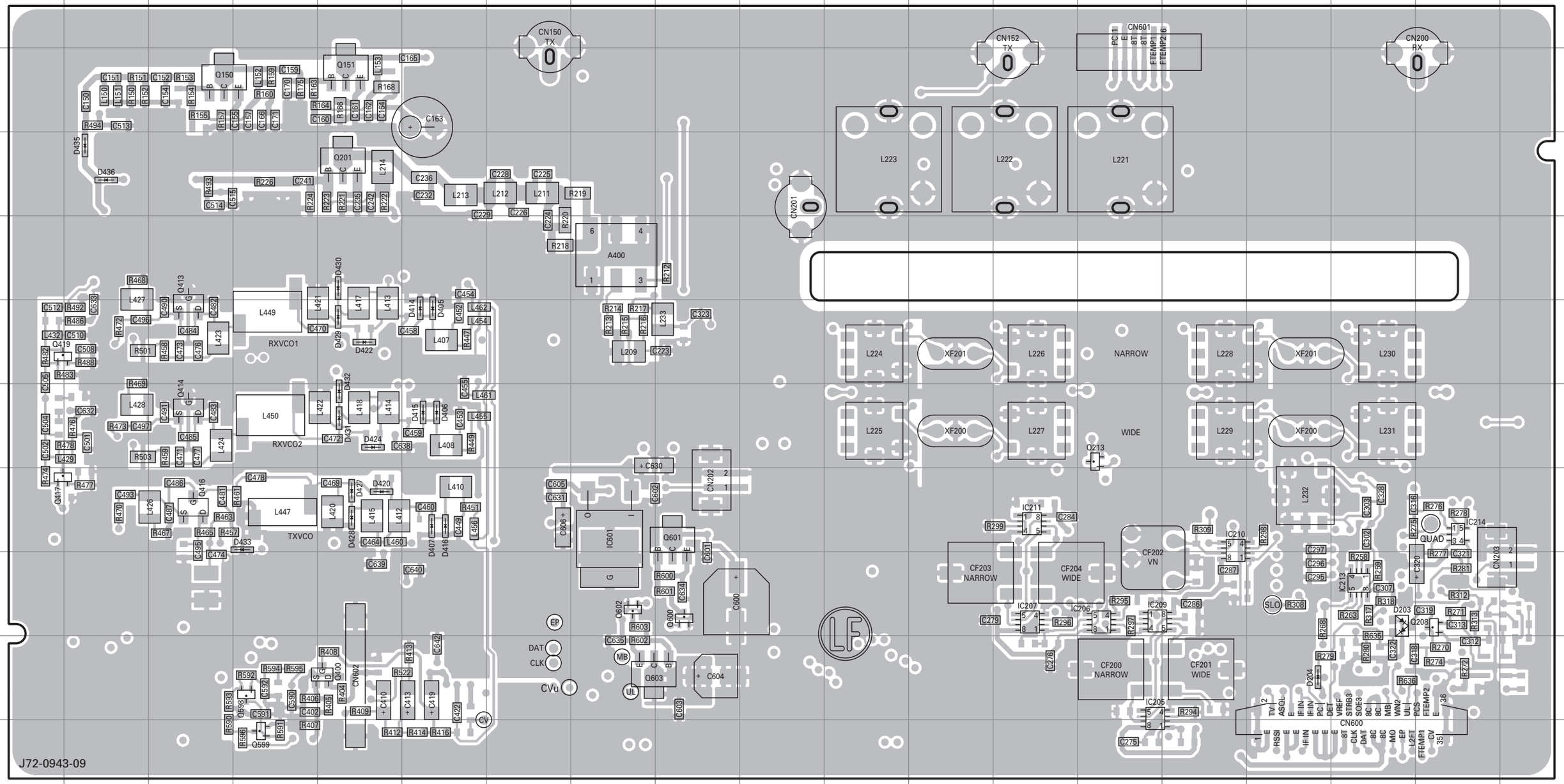


Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

PC BOARD TK-5710(B)/5710H(B)

TX-RX UNIT (X57-7030-10)
Component side view (J72-0943-09)

TX-RX UNIT (X57-7030-10)
Component side view (J72-0943-09)

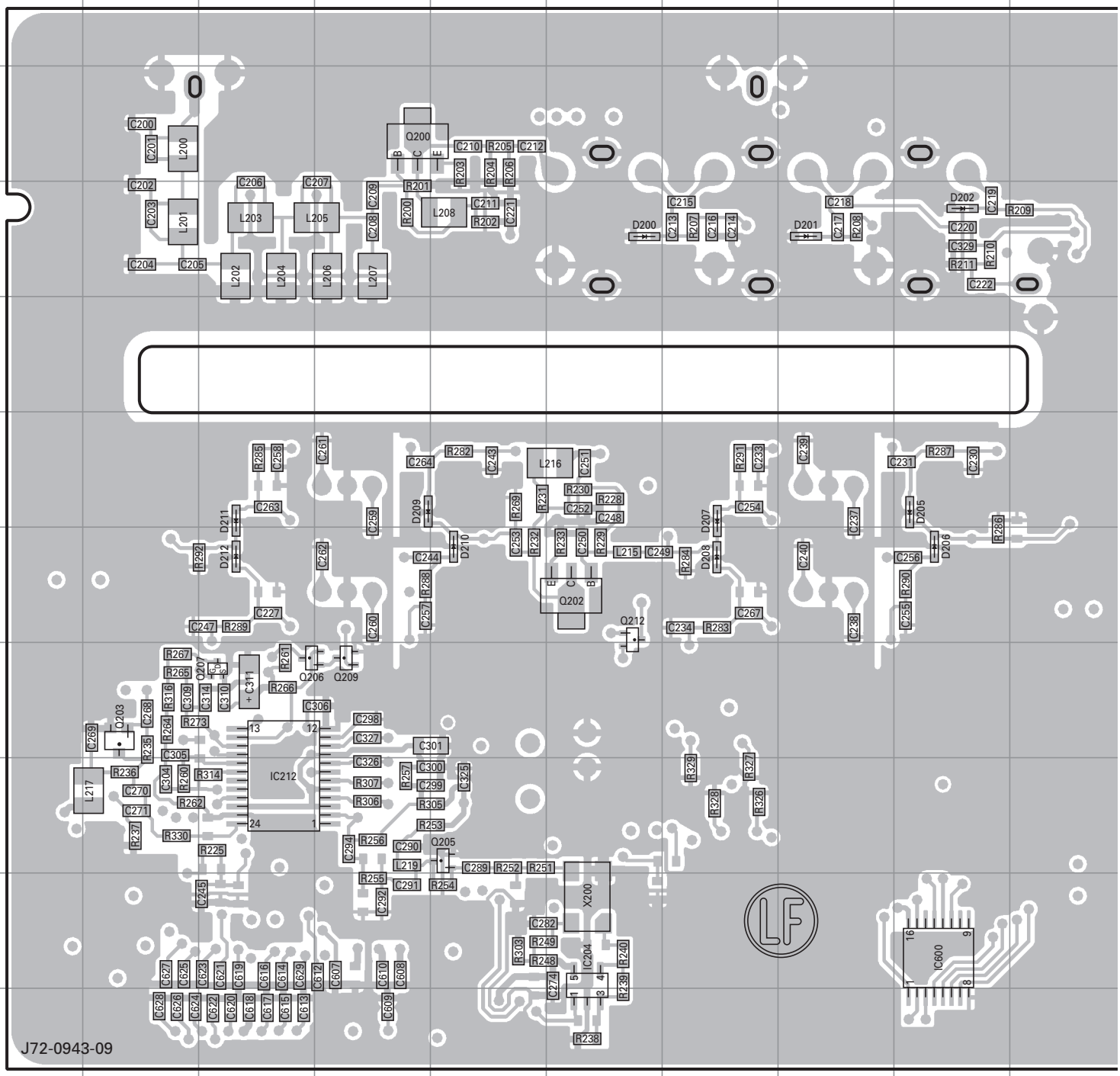


Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC205	10N	IC601	8H	Q414	7C	Q602	9H	D415	7F	D430	5E
IC206	9N	Q150	3C	Q416	8C	Q603	10H	D416	8F	D431	7E
IC207	9M	Q151	3E	Q417	8A	D203	9Q	D420	8E	D432	7E
IC209	9N	Q201	4E	Q419	6A	D204	10P	D422	6E	D433	8D
IC210	8O	Q208	9R	Q598	10D	D405	6F	D424	7E	D435	4B
IC211	8M	Q213	7N	Q599	11D	D406	7F	D427	8E	D436	4B
IC213	9Q	Q400	10E	Q600	9I	D407	8F	D428	8E		
IC214	8R	Q413	6C	Q601	8I	D414	6F	D429	6E		

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

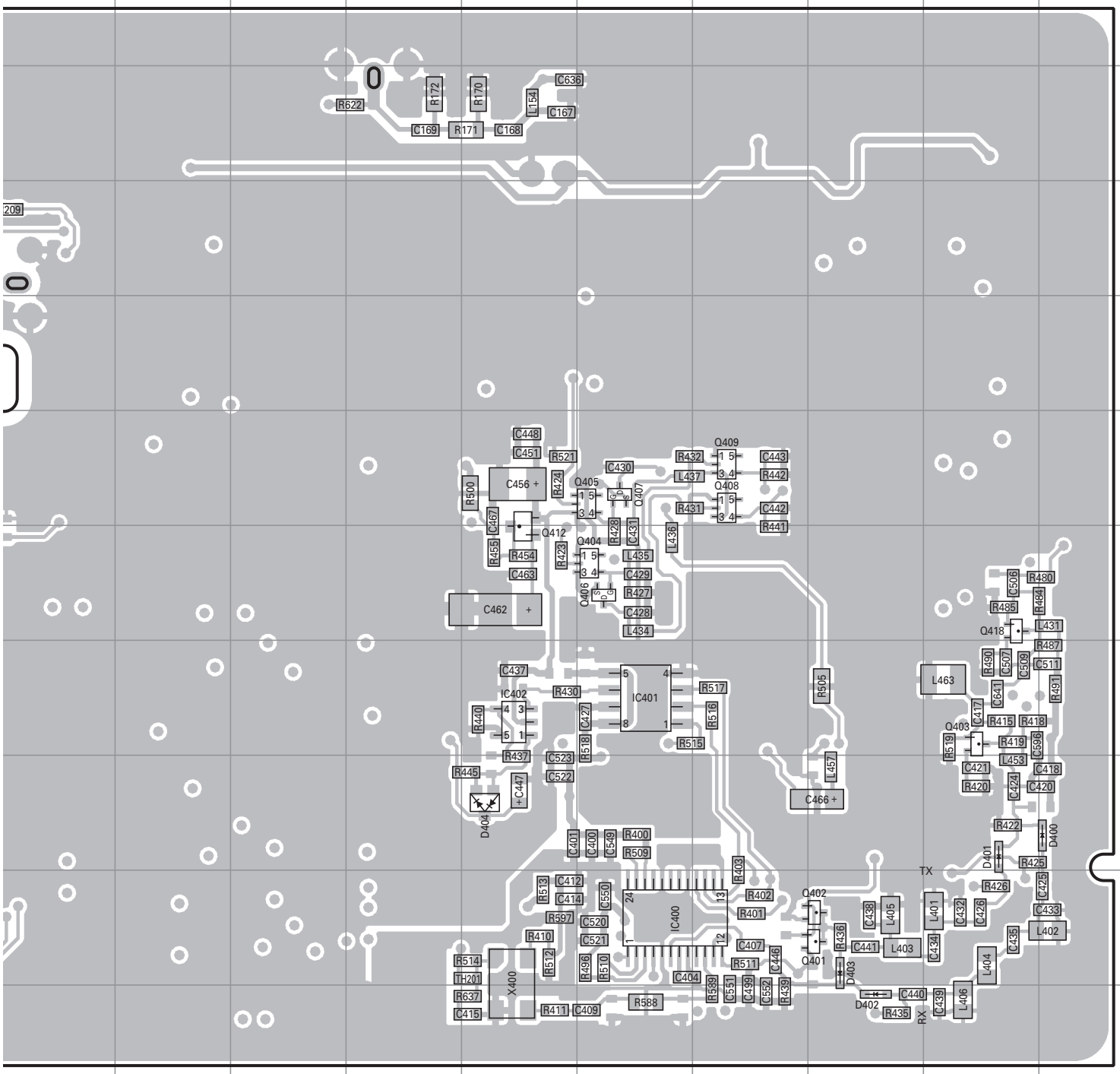
TK-5710(B)/5710H(B) PC BOARD

TX-RX UNIT (X57-7030-10)
Foil side view (J72-0943-09)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC204	10F	Q202	7F	Q401	10Q	Q408	6P	D205	6I	D212	7C
IC212	9C	Q203	8B	Q402	10Q	Q409	6P	D206	7I	D400	9S
IC400	10O	Q205	9E	Q403	8R	Q412	7N	D207	6G	D401	9R
IC401	8O	Q206	8C	Q404	7O	Q418	7R	D208	7G	D402	11Q
IC402	8N	Q207	8C	Q405	6O	D200	4F	D209	6D	D403	10Q
IC600	10I	Q209	8D	Q406	7O	D201	4H	D210	7E	D404	9N
Q200	3D	Q212	7F	Q407	6O	D202	4I	D211	6C		

TX-RX UNIT (X57-7030-10)
Foil side view (J72-0943-09)

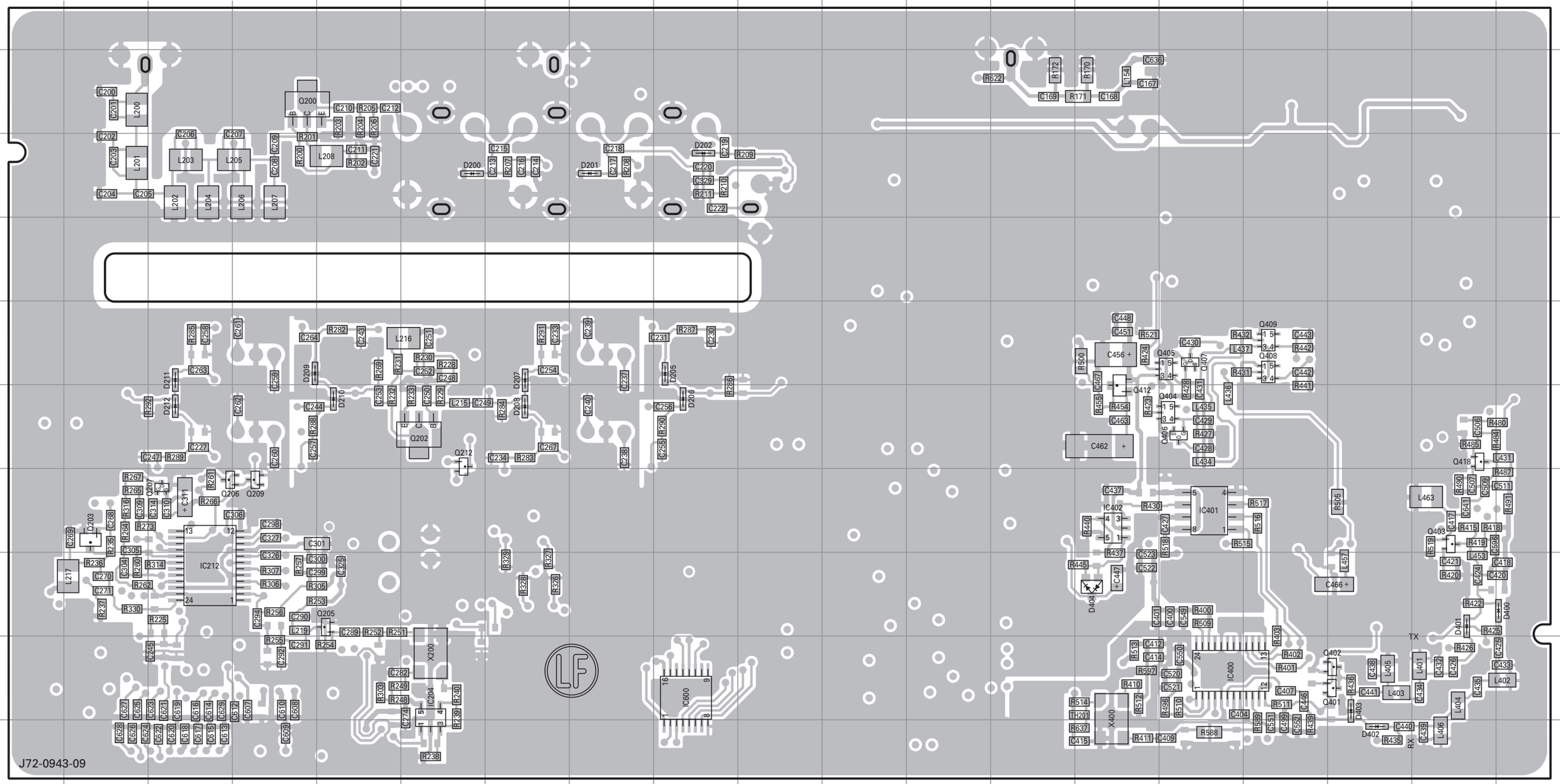


Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

PC BOARD TK-5710(B)/5710H(B)

TX-RX UNIT (X57-7030-10)
Foil side view (J72-0943-09)

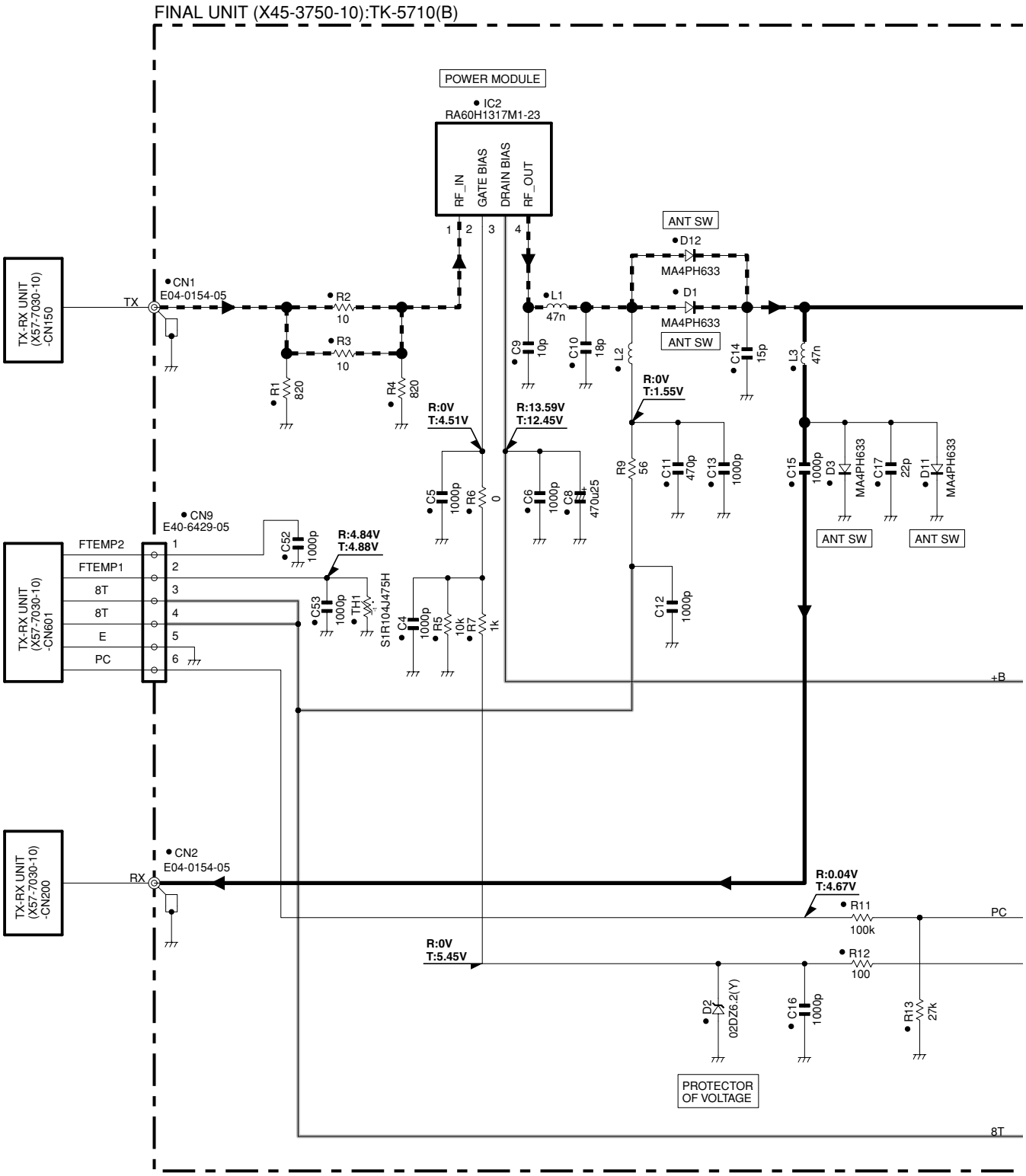
TX-RX UNIT (X57-7030-10)
Foil side view (J72-0943-09)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC204	10F	Q202	7F	Q401	10Q	Q408	6P	D205	6I	D212	7C
IC212	9C	Q203	8B	Q402	10Q	Q409	6P	D206	7I	D400	9S
IC400	10O	Q205	9E	Q403	8R	Q412	7N	D207	6G	D401	9R
IC401	8O	Q206	8C	Q404	7O	Q418	7R	D208	7G	D402	11Q
IC402	8N	Q207	8C	Q405	6O	D200	4F	D209	6D	D403	10Q
IC600	10I	Q209	8D	Q406	7O	D201	4H	D210	7E	D404	9N
Q200	3D	Q212	7F	Q407	6O	D202	4I	D211	6C		

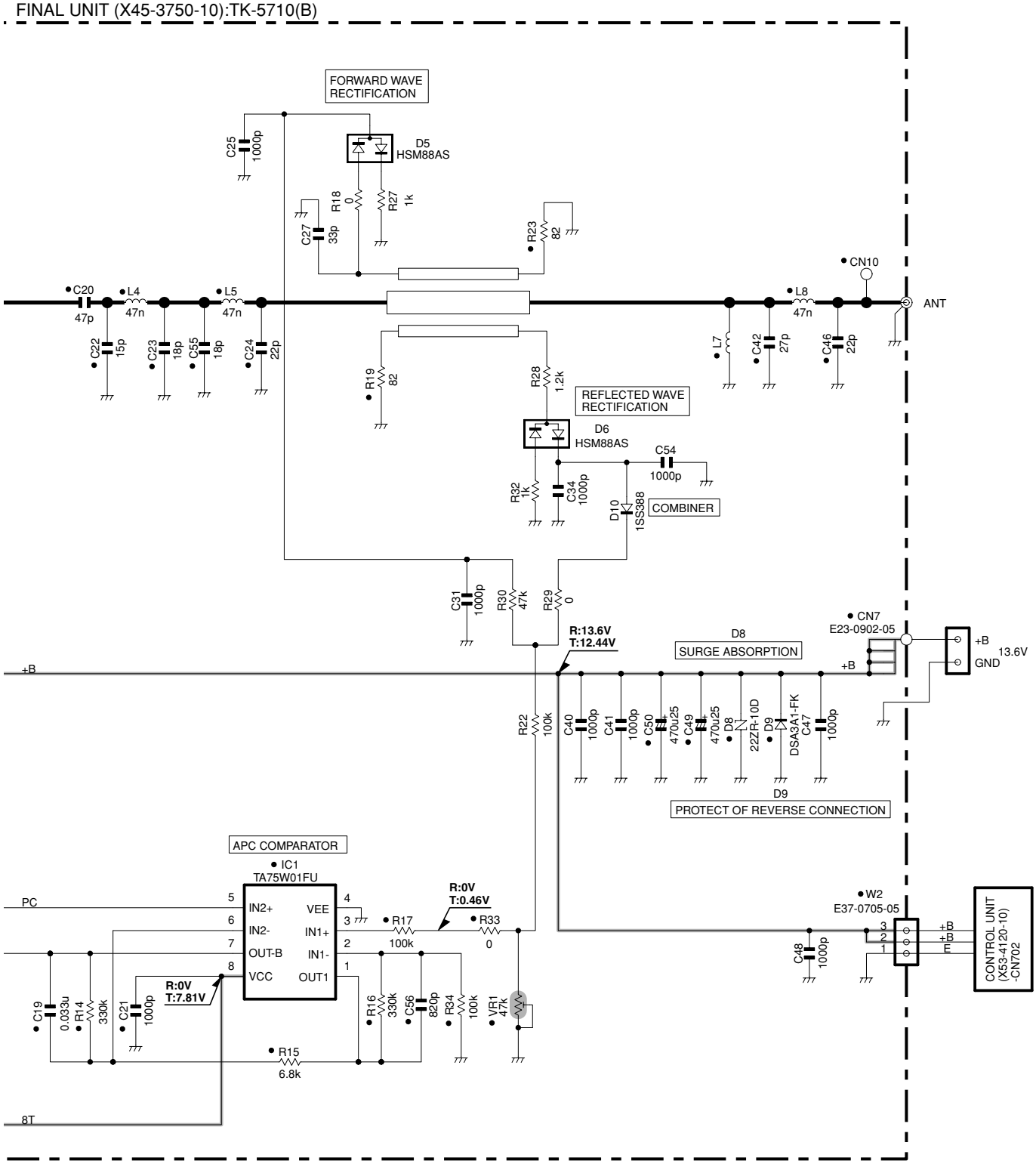
Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

TK-5710(B)/5710H(B) SCHEMATIC DIAGRAM

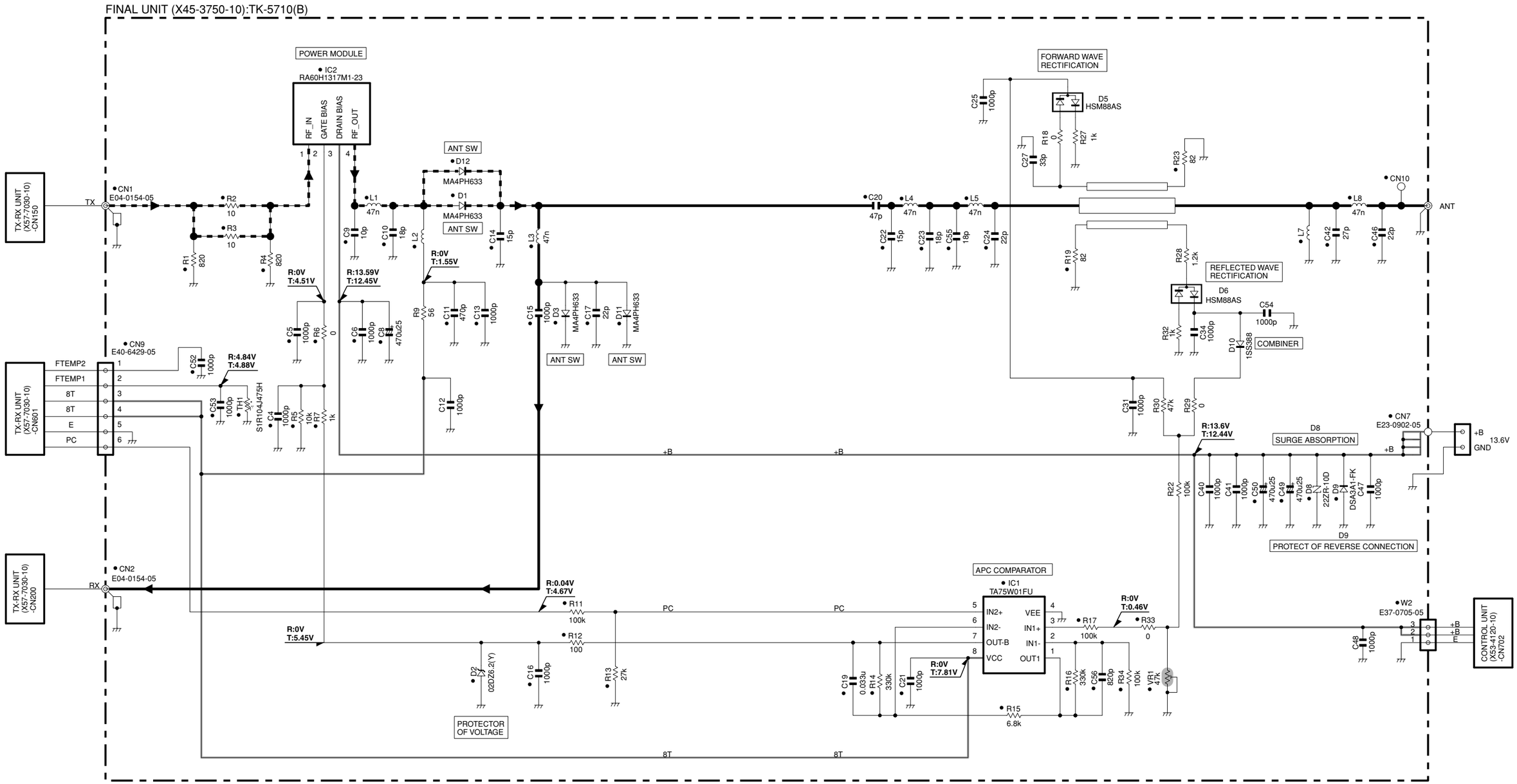


SCHEMATIC DIAGRAM TK-5710(B)/5710H(B)

FINAL UNIT (X45-3750-10):TK-5710(B)

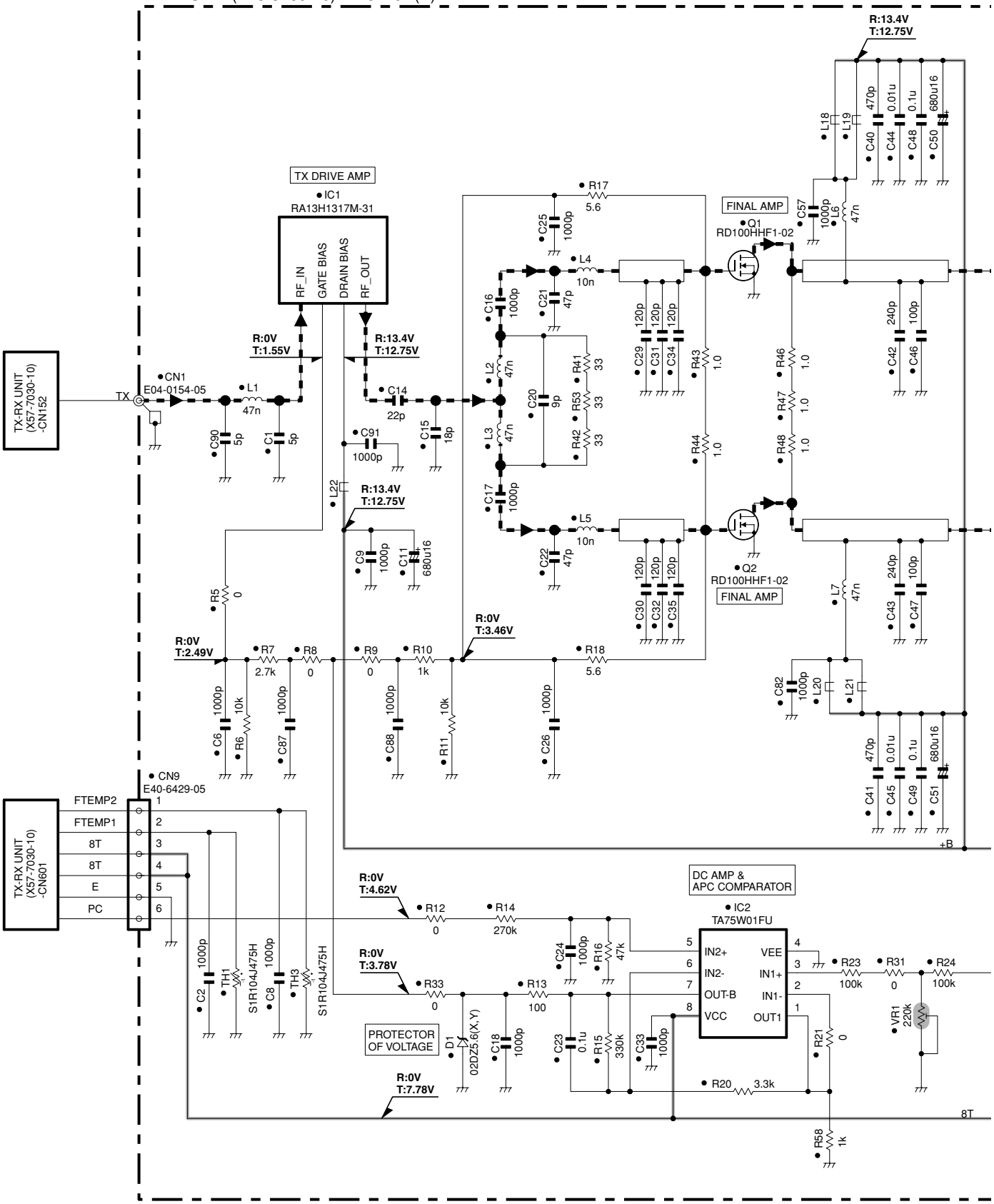


TK-5710(B)/5710H(B) SCHEMATIC DIAGRAM



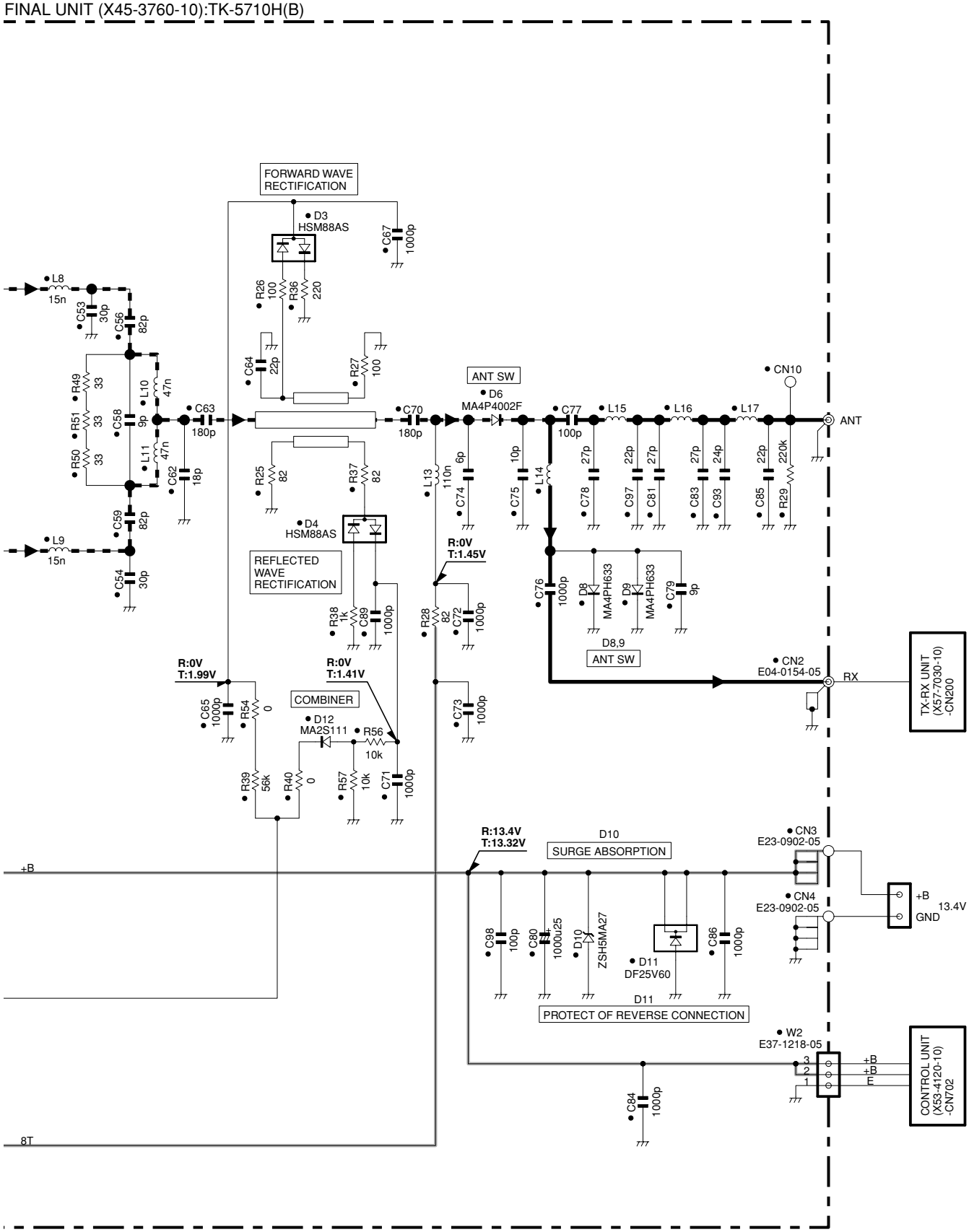
TK-5710(B)/5710H(B) SCHEMATIC DIAGRAM

FINAL UNIT (X45-3760-10):TK-5710H(B)



SCHEMATIC DIAGRAM TK-5710(B)/5710H(B)

FINAL UNIT (X45-3760-10):TK-5710H(B)



FINAL UNIT (X45-3760-10):TK-5710H(B)

TX-RX UNIT (X57-7030-10) -CN152

TX

CN1 E04-0154-05

L1 47n

C90 5p

C1 5p

TX DRIVE AMP

IC1 RA13H1317M-31

RF_IN | GATE BIAS | DRAIN BIAS | RF_OUT

R:0V T:1.55V

R:13.4V T:12.75V

C14 22p

C15 18p

C91 1000p

L22

R:13.4V T:12.75V

C9 1000p

C11 680u16

R5 0

R:0V T:2.49V

R7 2.7k

R8 0

C6 1000p

R6 10k

C87 1000p

R:0V T:3.46V

R9 0

R10 1k

C88 1000p

R11 10k

R18 5.6

C26 1000p

R17 5.6

C25 1000p

L4 10n

C16 1000p

C21 47p

L2 47n

C20 9p

L3 47n

C17 1000p

L5 10n

C22 47p

C29 120p

C31 120p

C34 120p

R41 33

R53 33

R42 33

R43 1.0

R44 1.0

C30 120p

C32 120p

C35 120p

FINAL AMP

Q1 RD100HHF1-02

Q2 RD100HHF1-02

FINAL AMP

R46 1.0

R47 1.0

R48 1.0

C57 1000p

L6 47n

L18

L19

C40 470p

C44 0.01u

C48 0.1u

C50 680u16

R:13.4V T:12.75V

L7 47n

C43 240p

C47 100p

C82 1000p

L20

L21

C41 470p

C45 0.01u

C49 0.1u

C51 680u16

C42 240p

C46 100p

+B

L8 15n

L9 15n

C53 30p

C56 82p

R49 33

R51 33

R50 33

C58 9p

L10 47n

L11 47n

C62 18p

C59 82p

C54 30p

C63 180p

FORWARD WAVE RECTIFICATION

D3 HSM88AS

C67 1000p

R26 100

R36 220

C64 22p

R27 100

R25 82

R37 82

D4 HSM88AS

REFLECTED WAVE RECTIFICATION

R38 1k

C80 1000p

R:0V T:1.99V

C65 1000p

R54 0

R39 56k

R40 0

R:0V T:1.41V

COMBINER

D12 MA2S111

R56 10k

R57 10k

C71 1000p

C70 180p

ANT SW

D6 MA4P4002F

L13 110n

C74 6p

R:0V T:1.45V

R28 82

C72 1000p

C73 1000p

C77 100p

L15

L16

L17

C10 6p

C75 10p

L14

C78 27p

C97 22p

C81 27p

C83 27p

C93 24p

C85 22p

R29 220k

C76 1000p

D8 MA4PH633

D9 MA4PH633

C79 9p

D8,9 ANT SW

CN10

ANT

CN2 E04-0154-05

RX

TX-RX UNIT (X57-7030-10) -CN200

TX-RX UNIT (X57-7030-10) -CN601

CN9 E40-6429-05

FTEMP2 1

FTEMP1 2

8T 3

8T 4

E 5

PC 6

C2 1000p

TH1 S1R104J475H

C8 1000p

TH3 S1R104J475H

R:0V T:4.62V

R12 0

R14 270k

R:0V T:3.78V

R33 0

R13 100

C24 1000p

R16 47k

C23 0.1u

R15 330k

C33 1000p

R20 3.3k

R:0V T:7.78V

PROTECTOR OF VOLTAGE

D1 02DZ5.6(X,Y)

C18 1000p

DC AMP & APC COMPARATOR

IC2 TA75W01FU

IN2+ 5 | VEE 4

IN2- 6 | IN1+ 3

OUT-B 7 | IN1- 2

VCC 8 | OUT1 1

R23 100k

R31 0

R24 100k

VR1 220k

R21 0

R58 1k

8T

8T

R:13.4V T:13.32V

D10 SURGE ABSORPTION

C98 100p

C60 1000u25

D10 ZSH5MA27

D11 DF25V60

C86 1000p

PROTECT OF REVERSE CONNECTION

C84 1000p

CN3 E23-0902-05

CN4 E23-0902-05

+B

GND

13.4V

W2 E37-1218-05

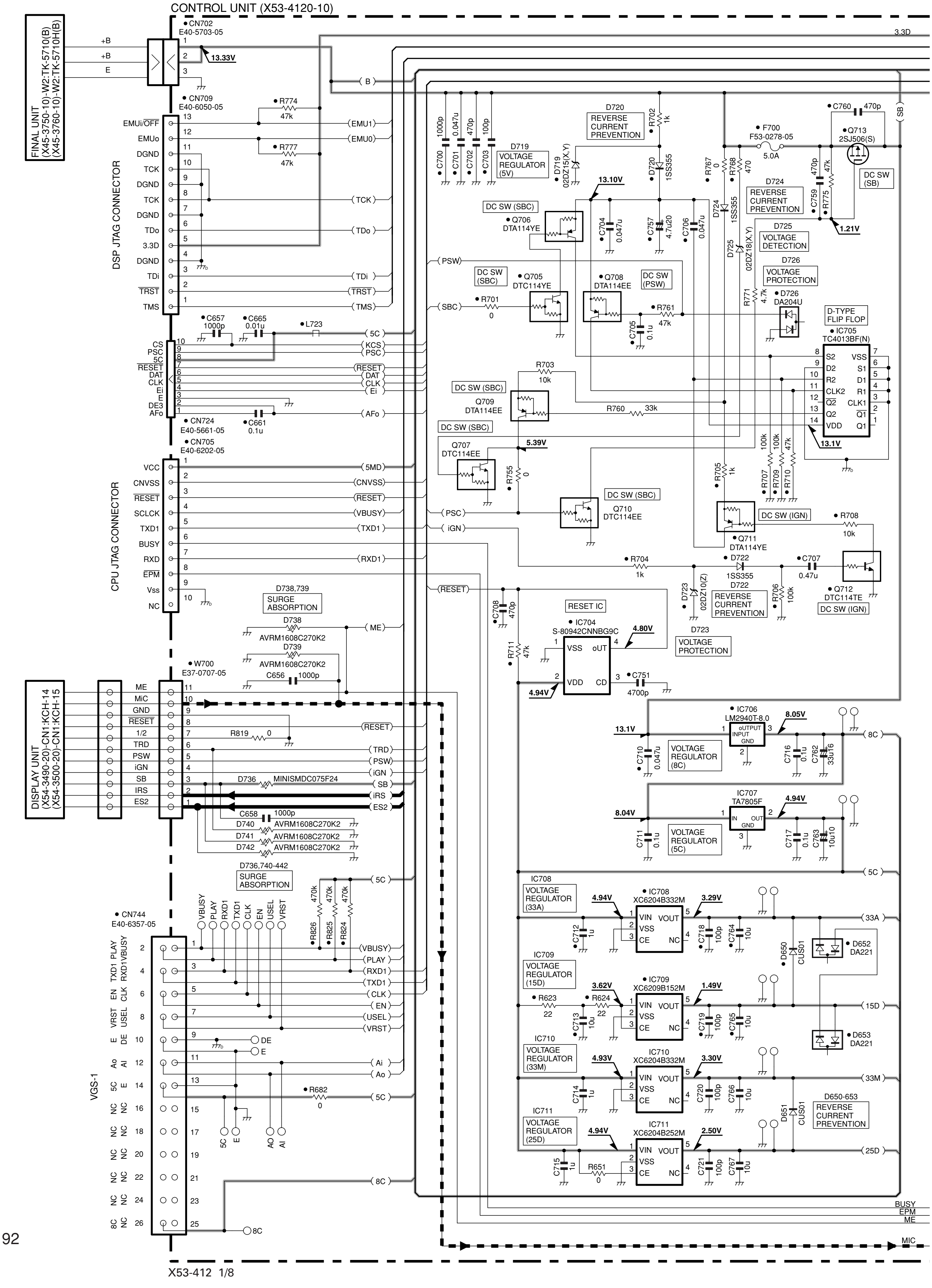
3 +B

2 +B

1 E

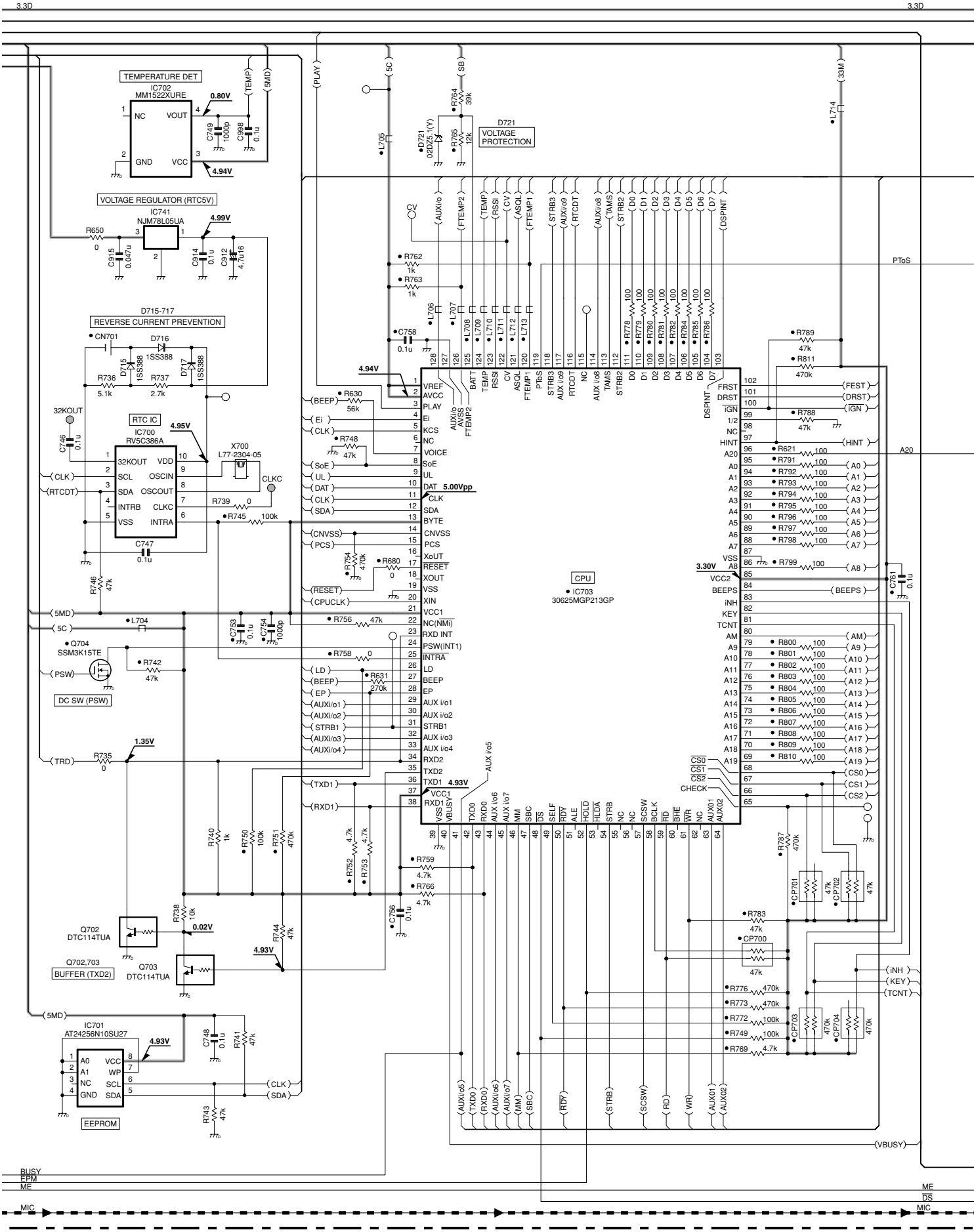
CONTROL UNIT (X53-4120-10) -CN702

TK-5710(B)/5710H(B) SCHEMATIC DIAGRAM



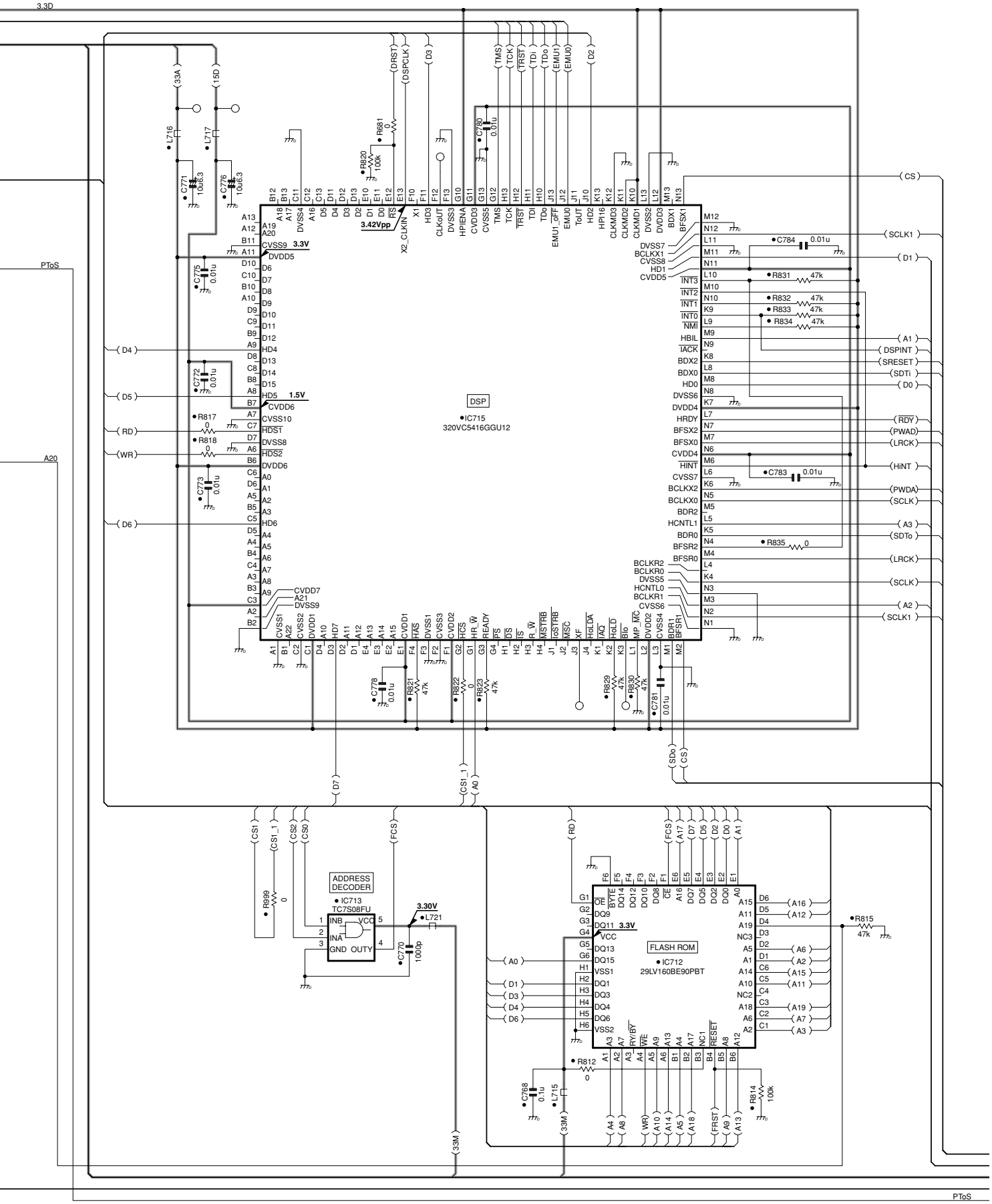
SCHEMATIC DIAGRAM TK-5710(B)/5710H(B)

CONTROL UNIT (X53-4120-10)



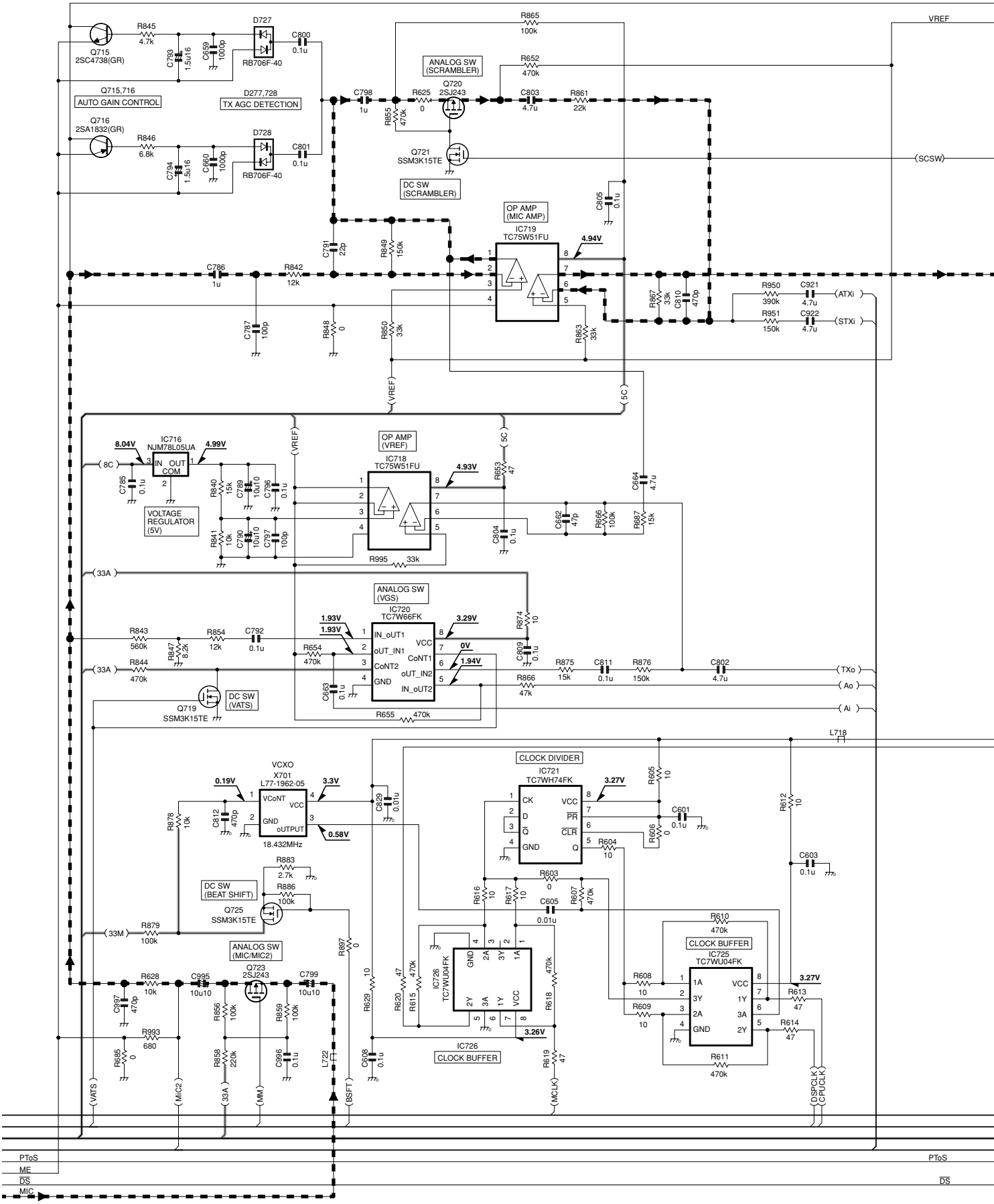
TK-5710(B)/5710H(B) SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4120-10)



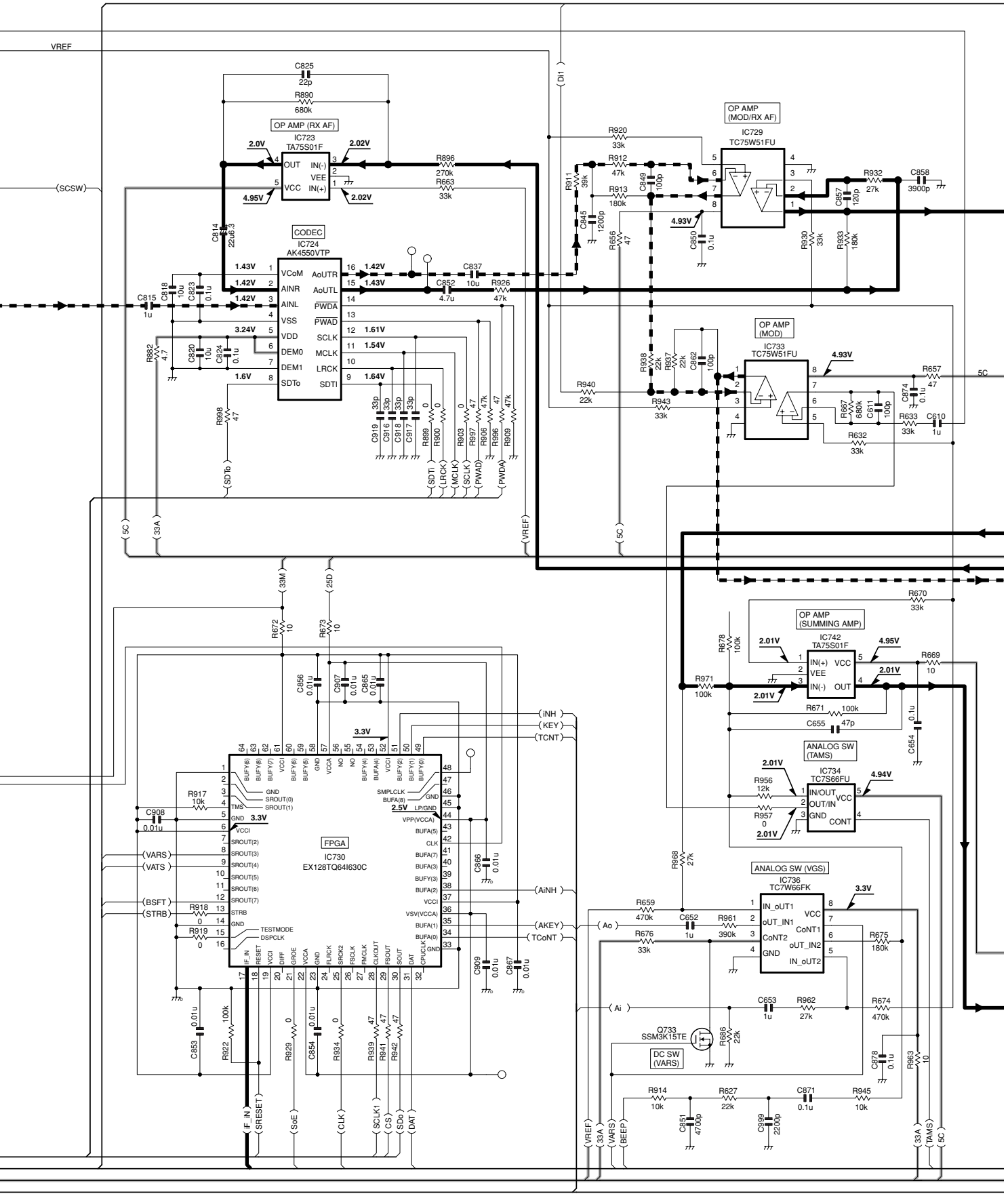
SCHEMATIC DIAGRAM TK-5710(B)/5710H(B)

CONTROL UNIT (X53-4120-10)



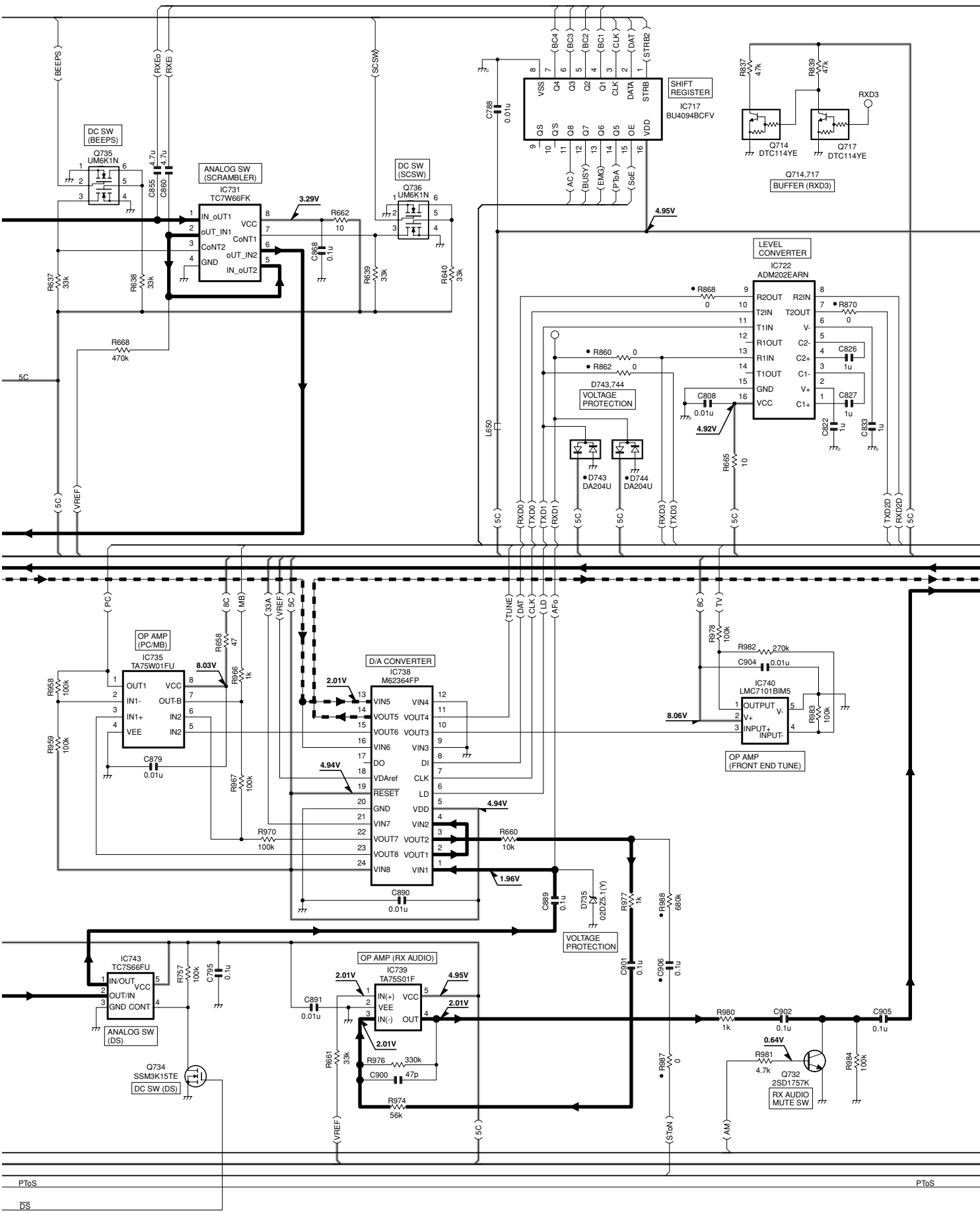
TK-5710(B)/5710H(B) SCHEMATIC DIAGRAM

CONTROL UNIT (X53-4120-10)



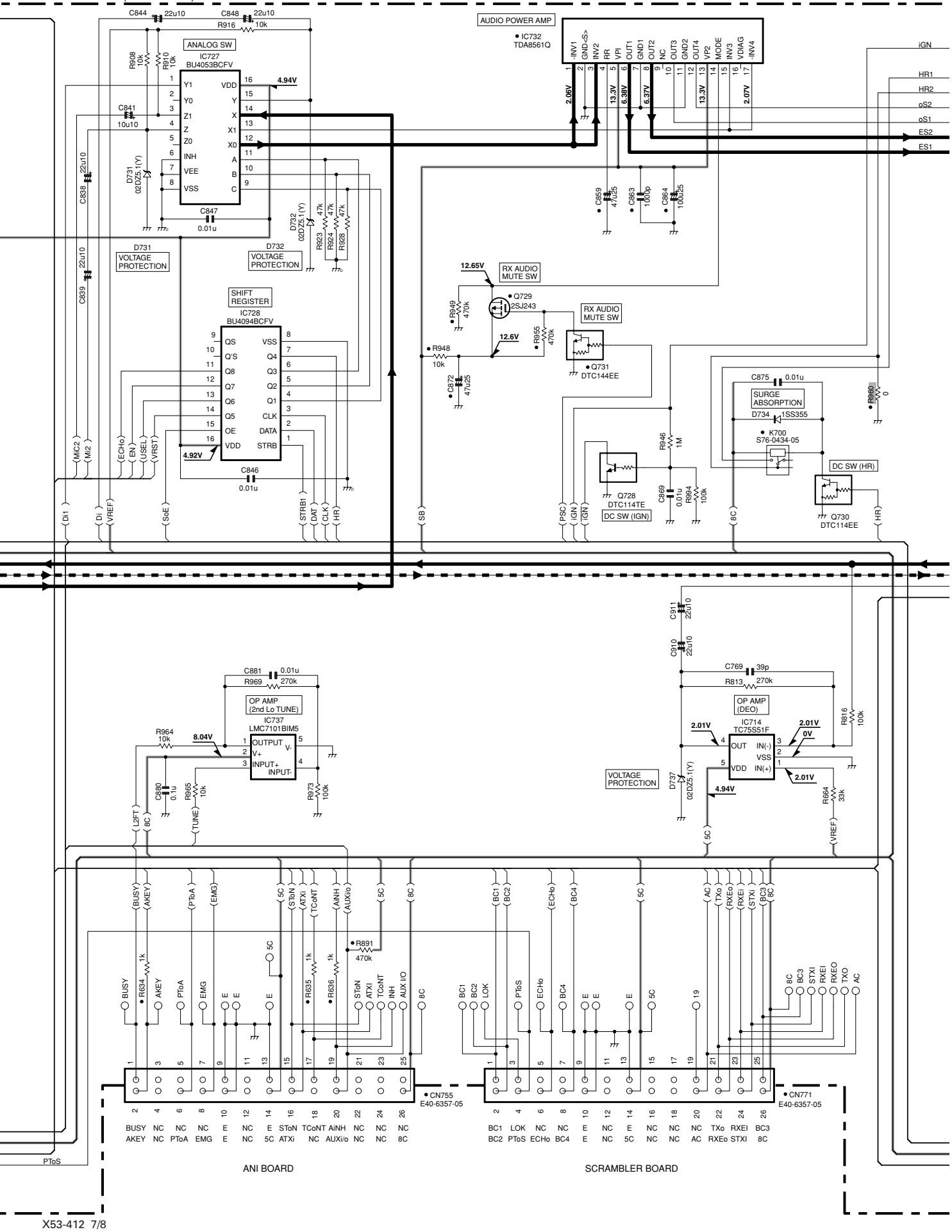
SCHEMATIC DIAGRAM TK-5710(B)/5710H(B)

CONTROL UNIT (X53-4120-10)

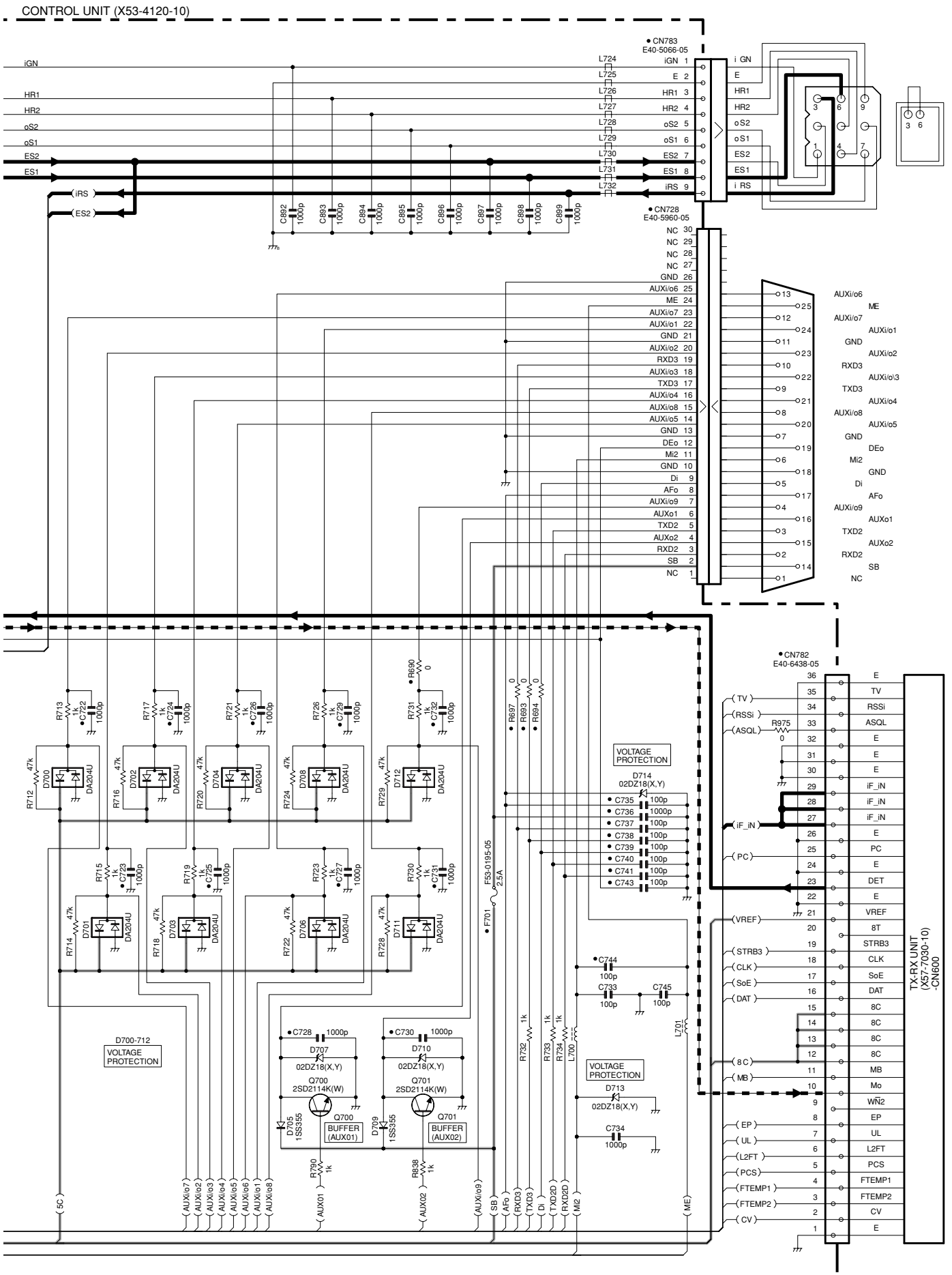


TK-5710(B)/5710H(B) SCHEMATIC DIAGRAM

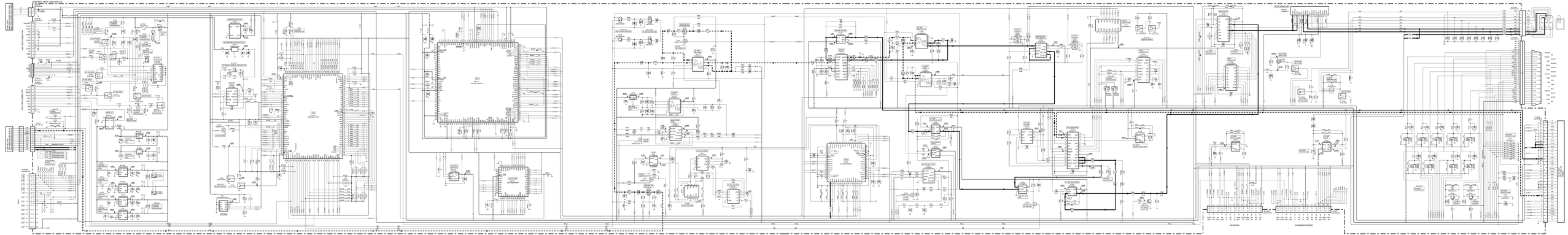
CONTROL UNIT (X53-4120-10)



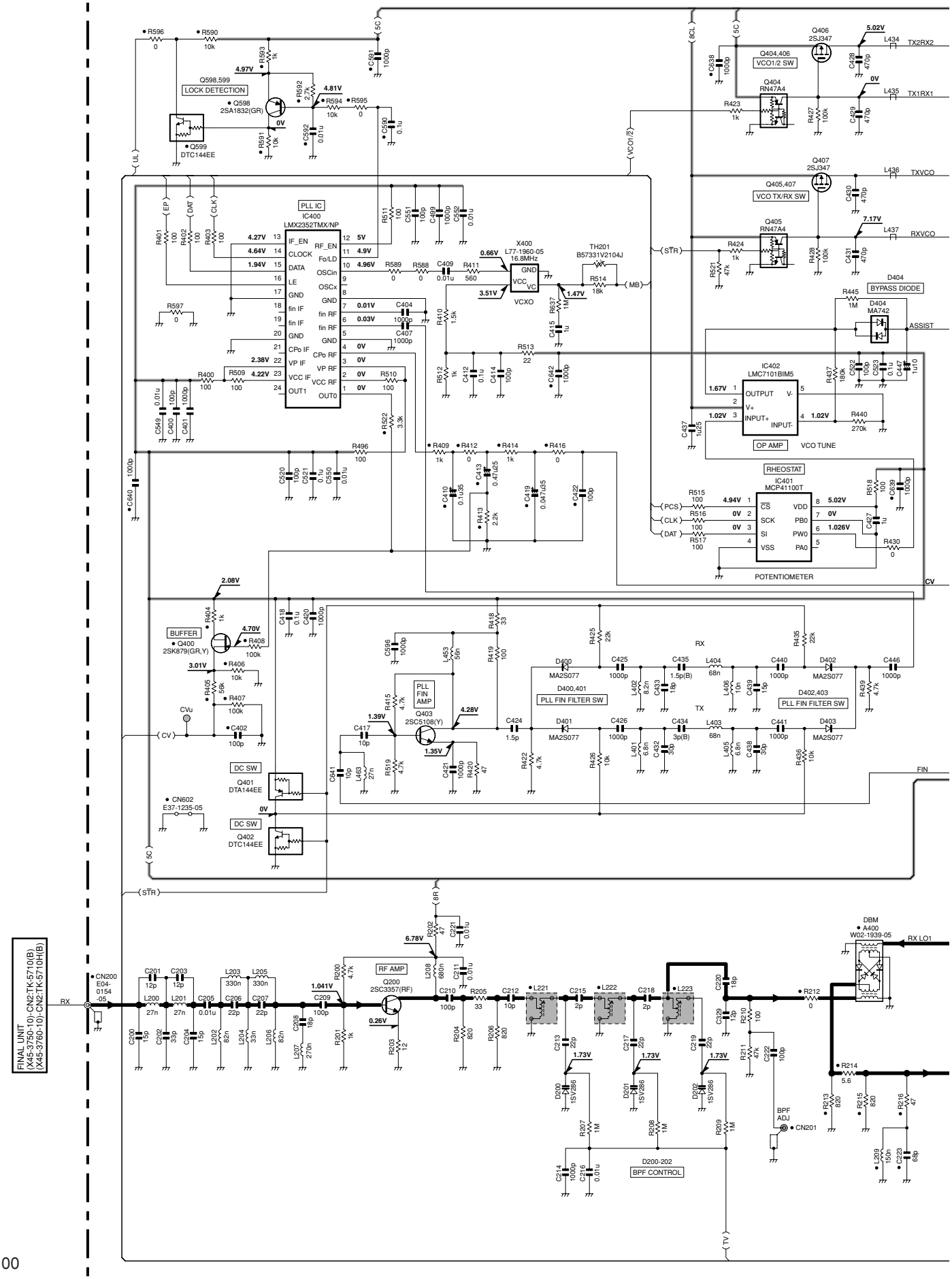
SCHEMATIC DIAGRAM TK-5710(B)/5710H(B)



TK-5710(B)/5710H(B) SCHEMATIC DIAGRAM

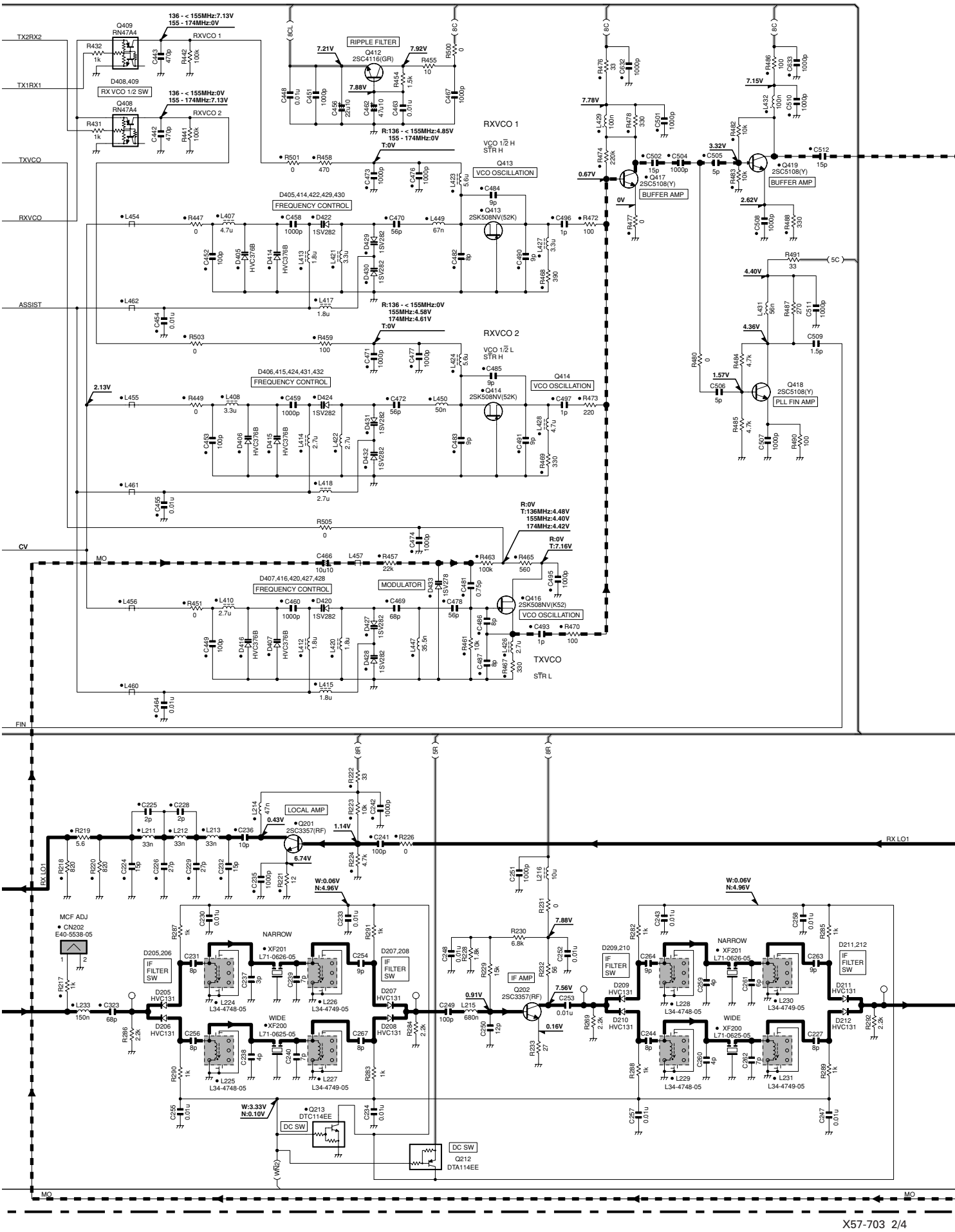


TK-5710(B)/5710H(B) SCHEMATIC DIAGRAM



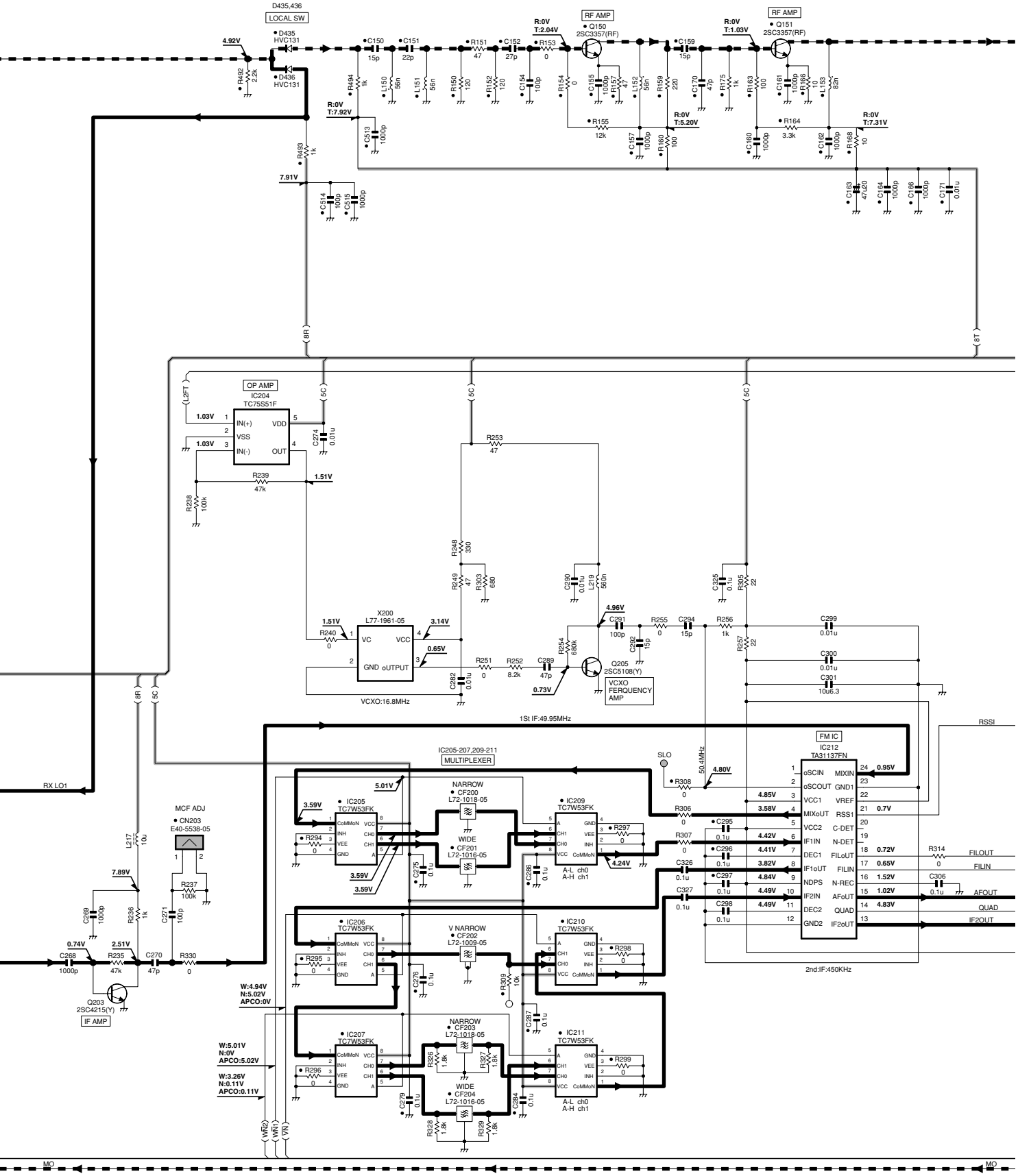
SCHEMATIC DIAGRAM TK-5710(B)/5710H(B)

TX-RX UNIT (X57-7030-10)



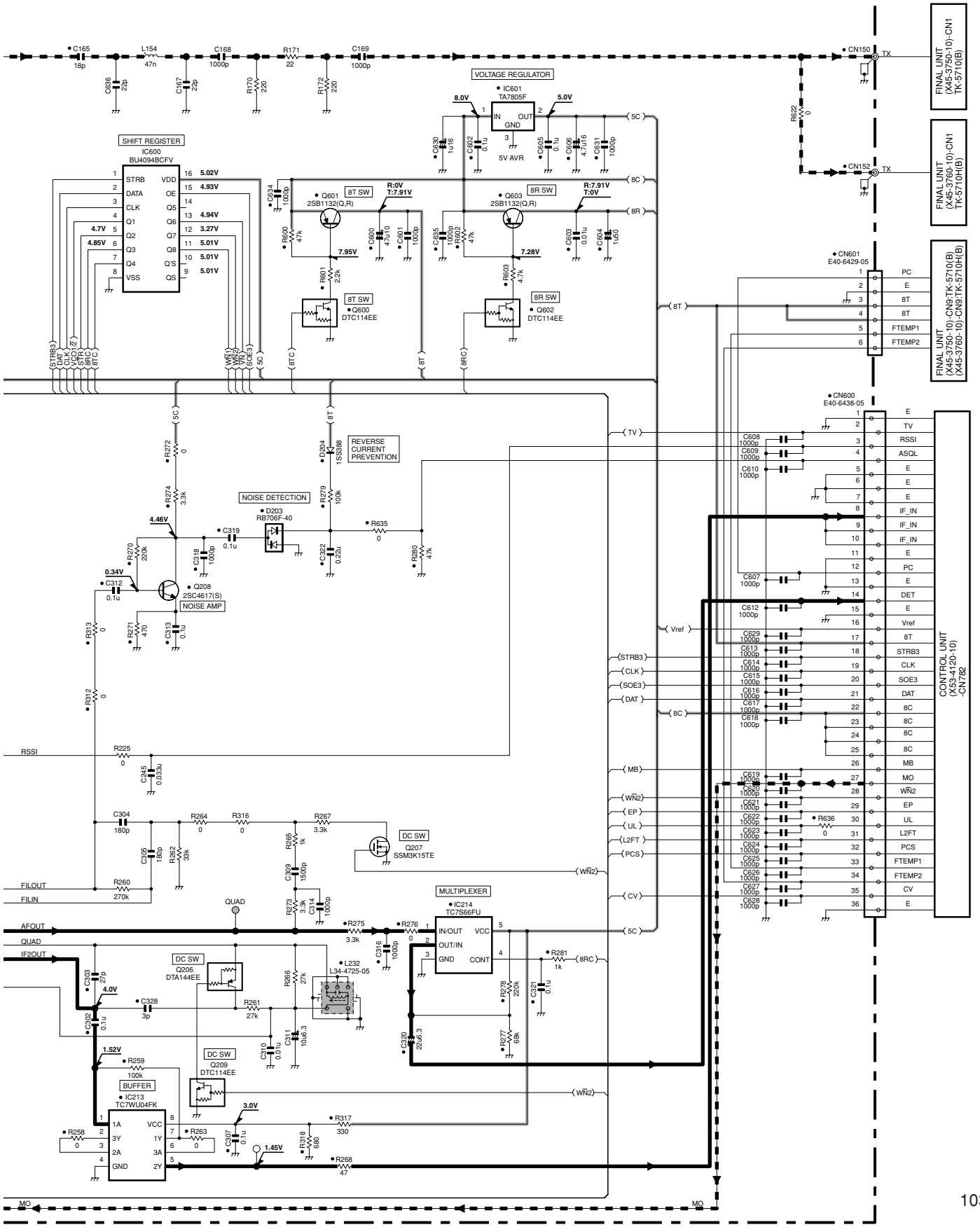
TK-5710(B)/5710H(B) SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7030-10)



SCHEMATIC DIAGRAM TK-5710(B)/5710H(B)

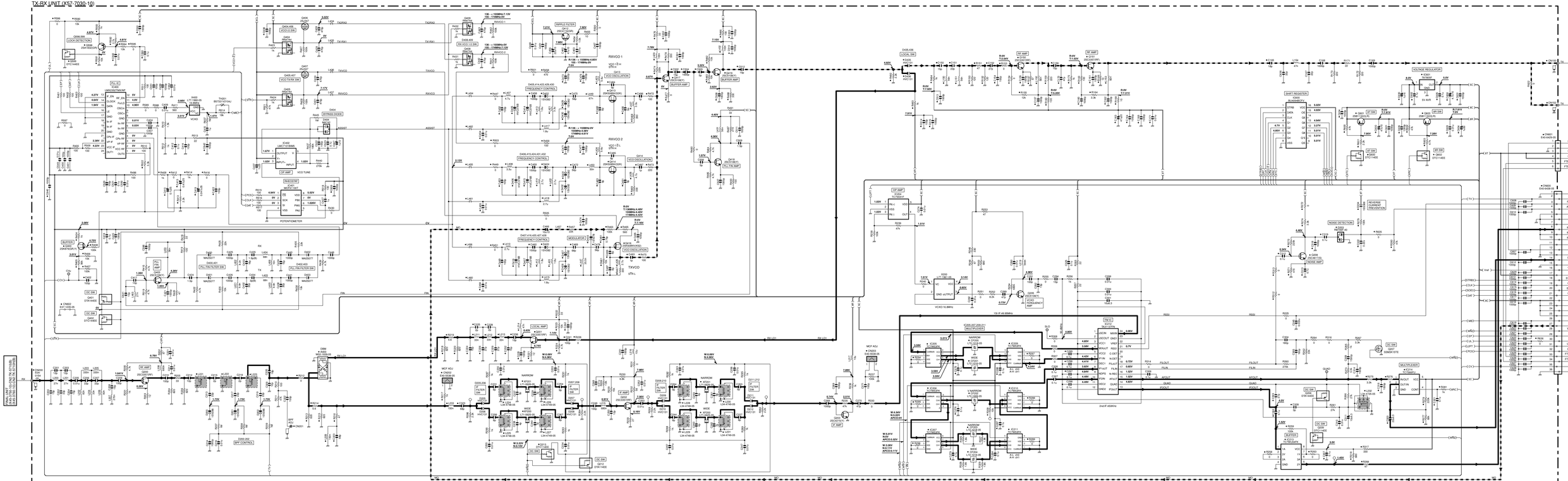
TX-RX UNIT (X57-7030-10)



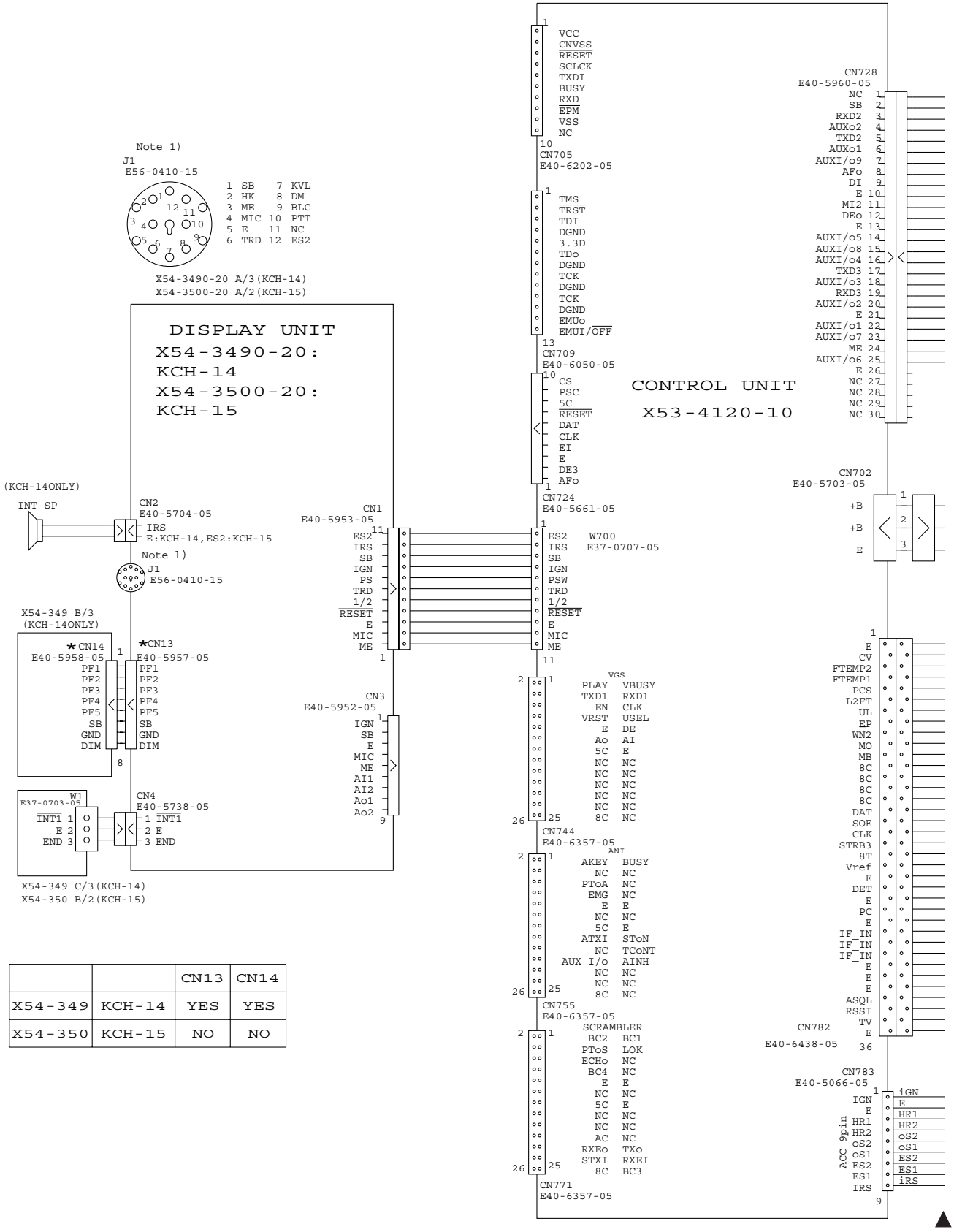
X57-703 4/4

TK-5710(B)/5710H(B) SCHEMATIC DIAGRAM

TX-RX UNIT (X57-7030-10)

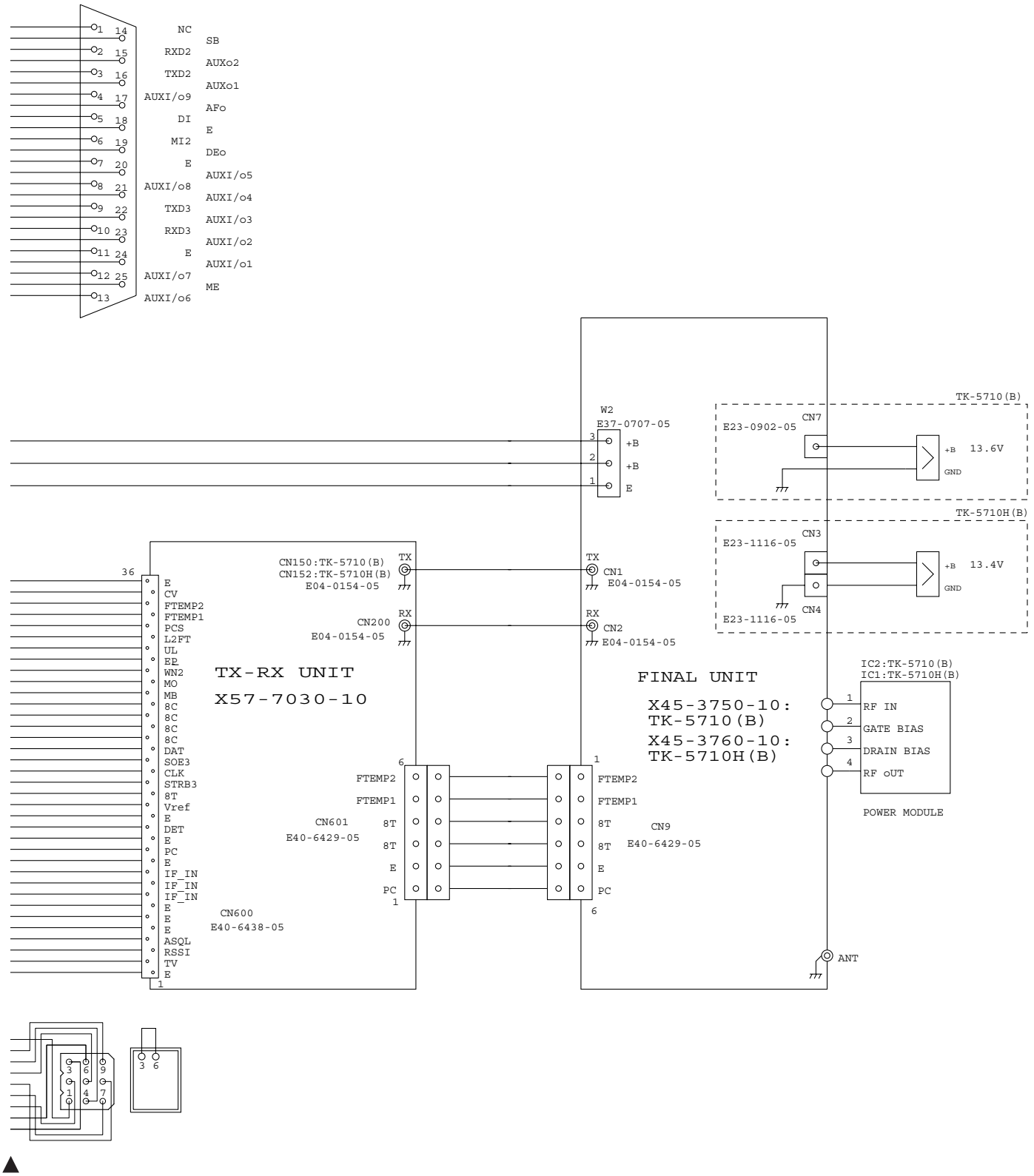


INTERCONNECTION DIAGRAM



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

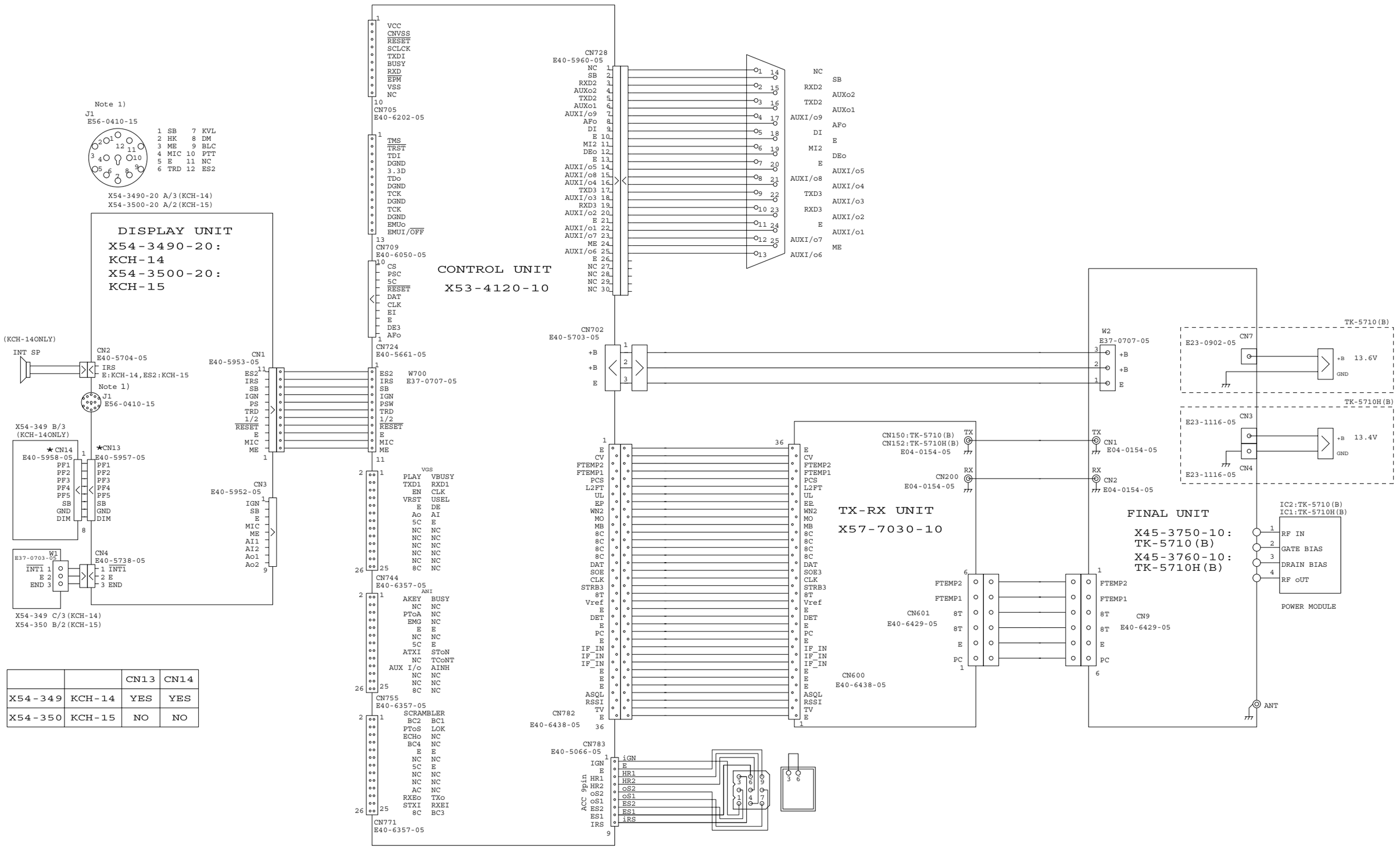
INTERCONNECTION DIAGRAM



INTERCONNECTION DIAGRAM

TK-5710(B)/5710H(B)

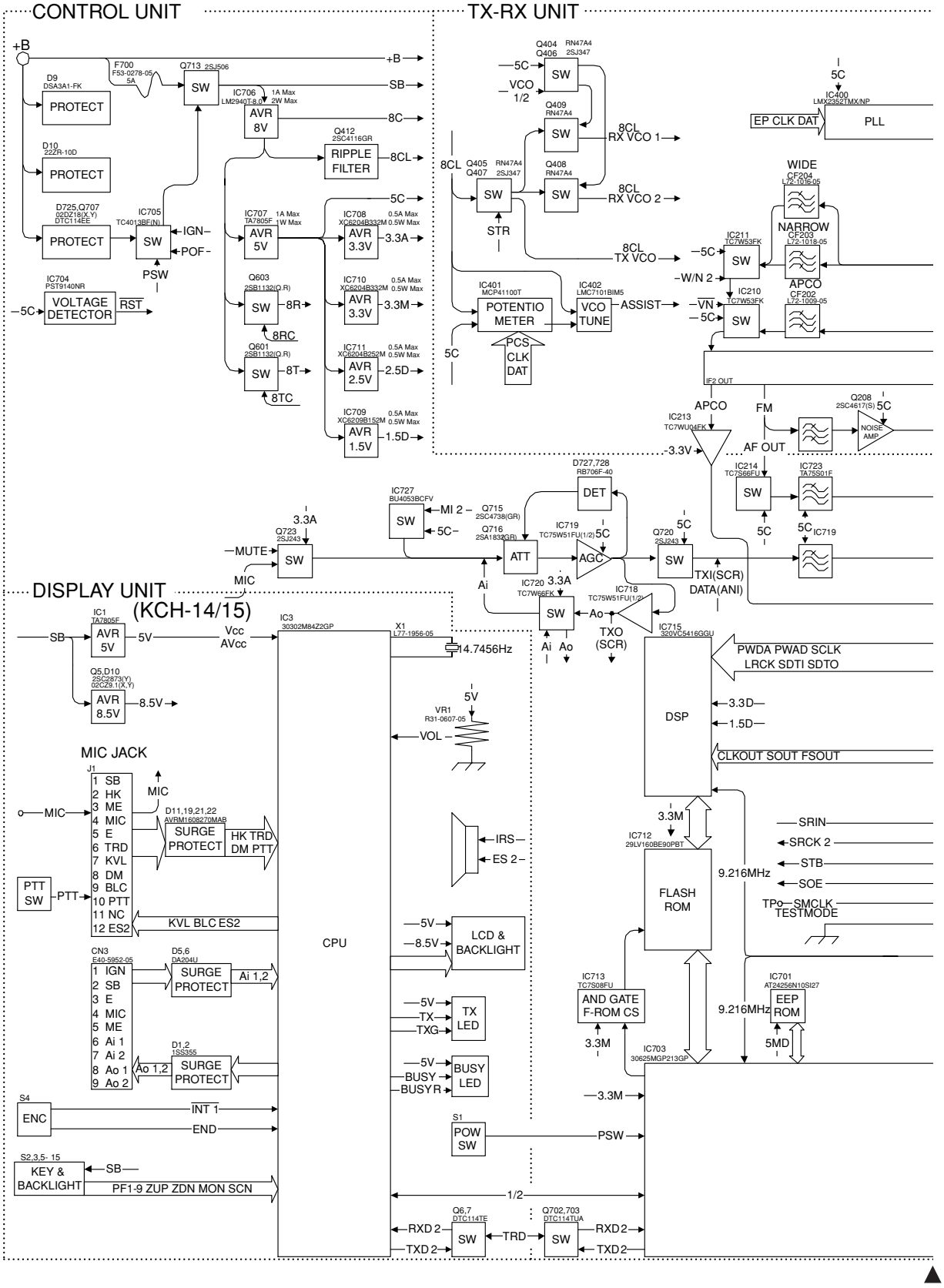
INTERCONNECTION DIAGRAM



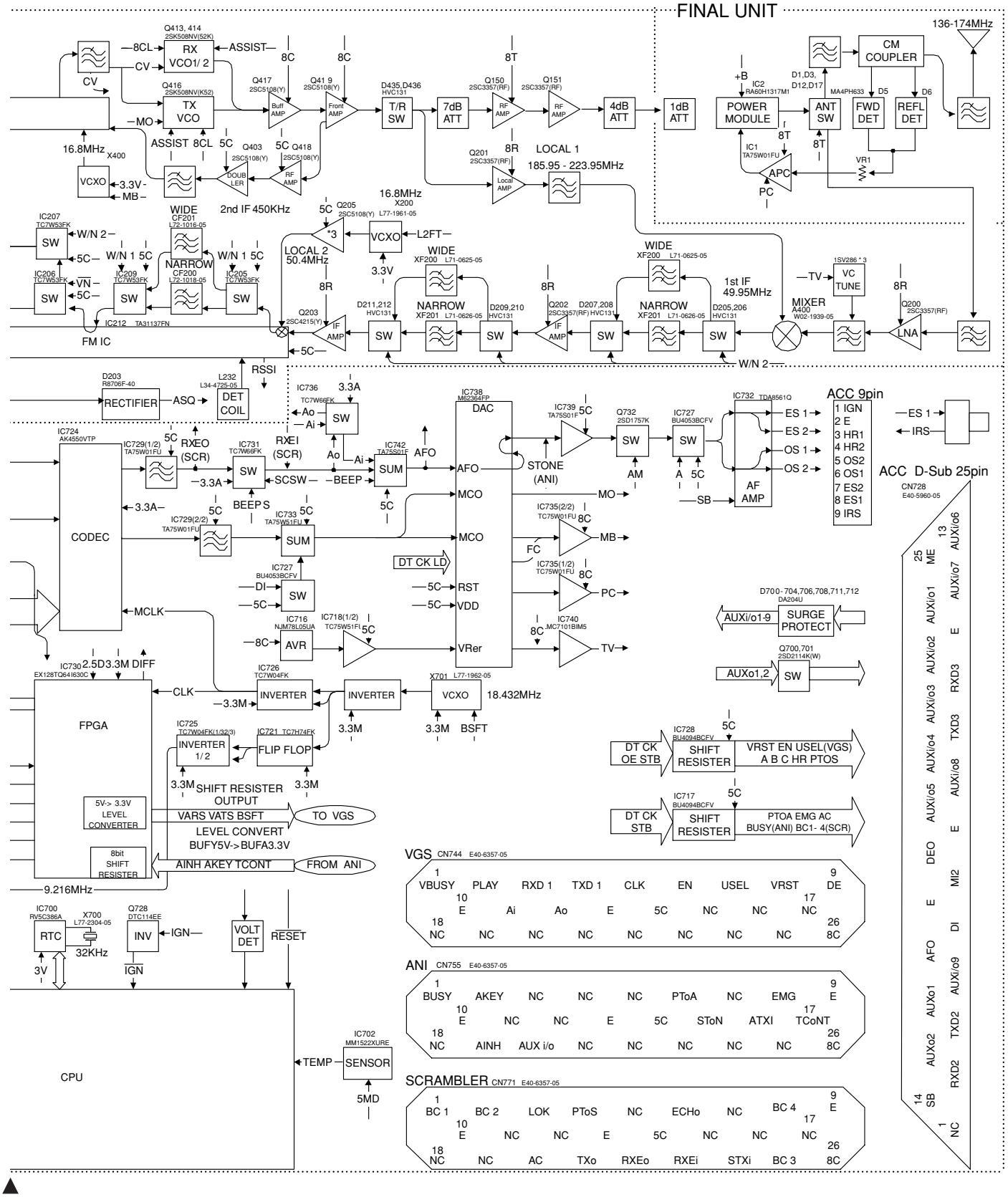
		CN13	CN14
X54-349	KCH-14	YES	YES
X54-350	KCH-15	NO	NO

BLOCK DIAGRAM

TK-5710(B) BLOCK DIAGRAM

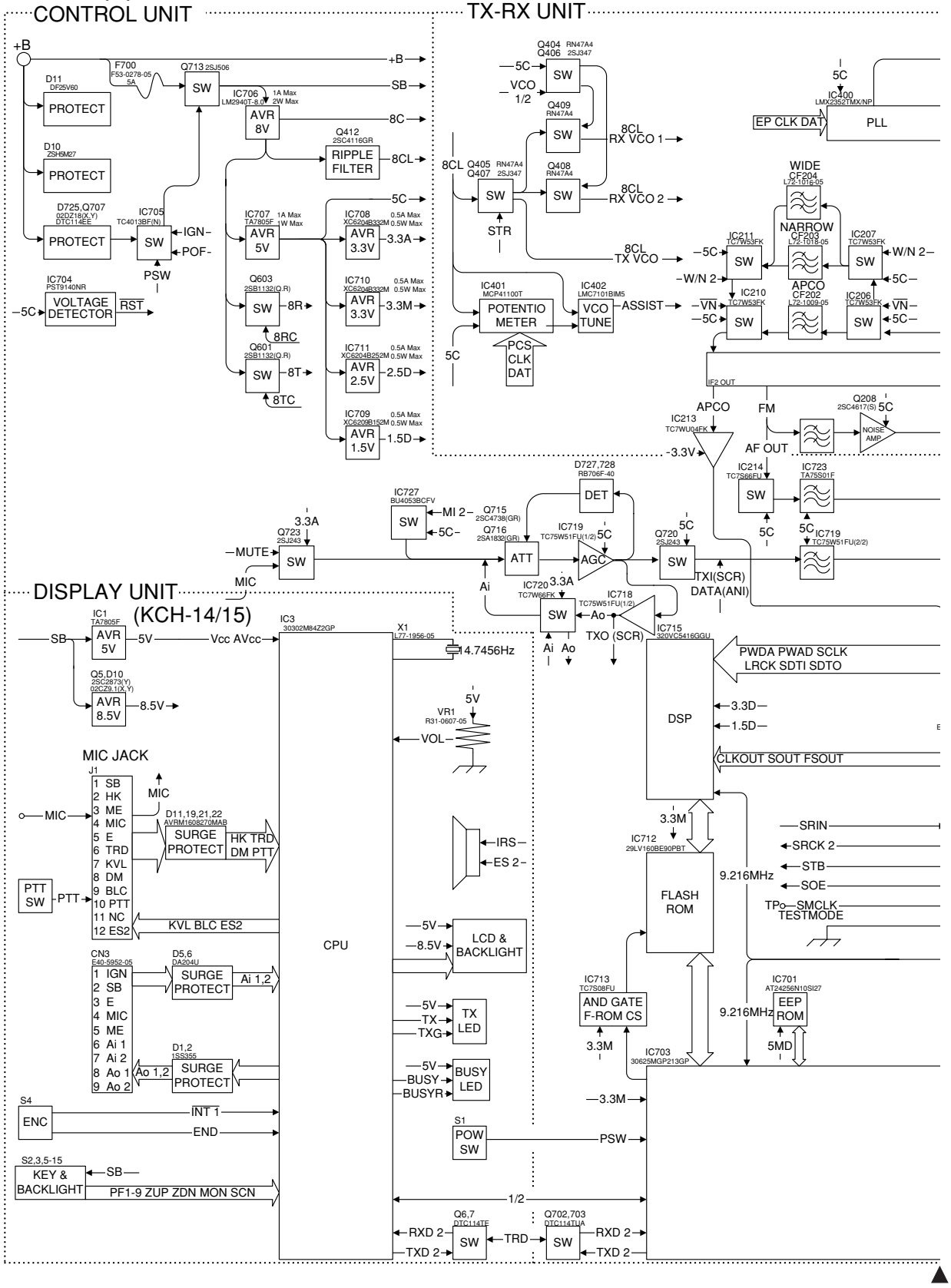


BLOCK DIAGRAM

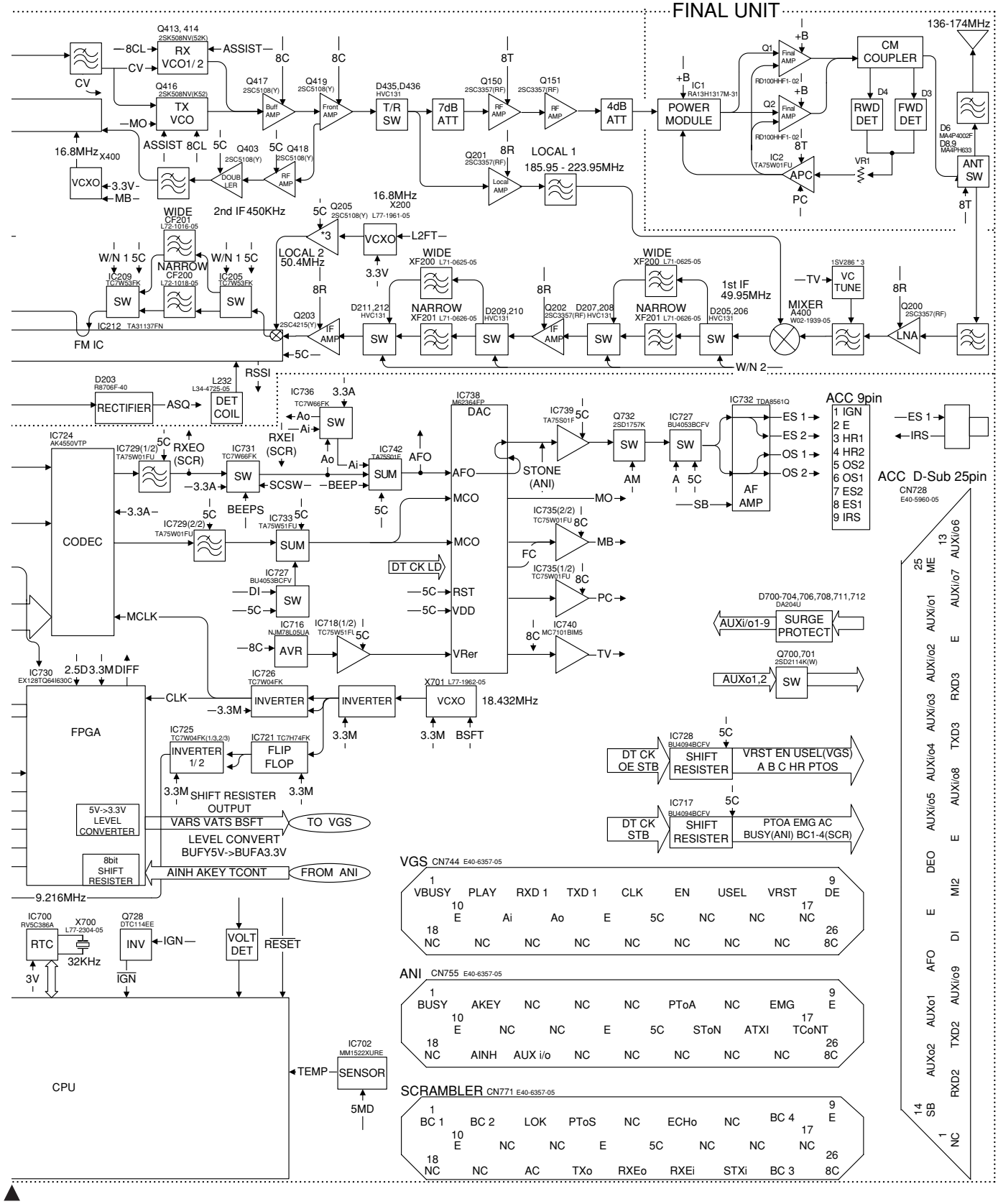


BLOCK DIAGRAM

TK-5710(B)H BLOCK DIAGRAM

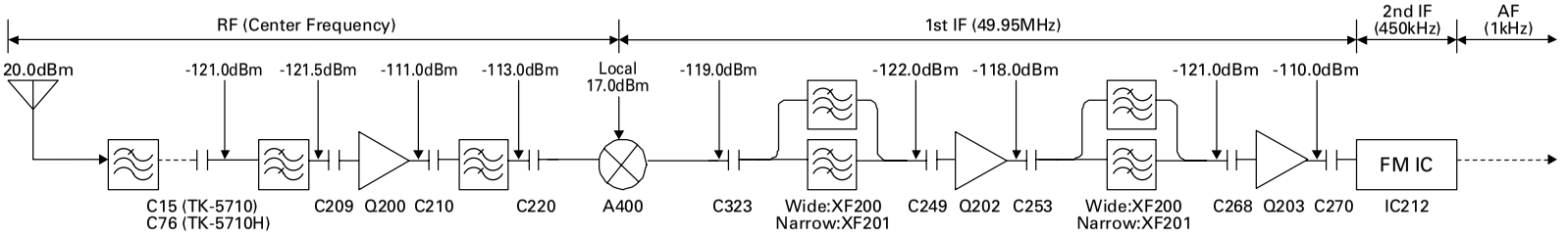


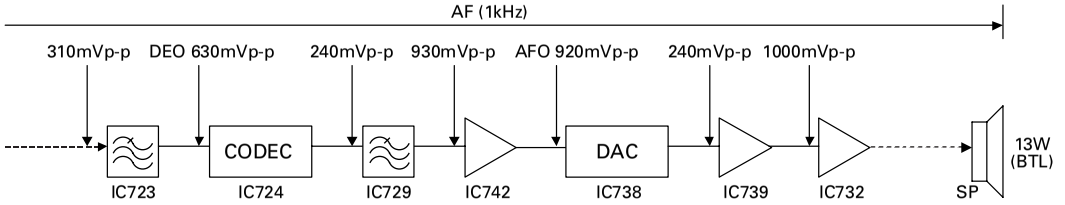
BLOCK DIAGRAM



Receiver Section

TK-5710/5710H

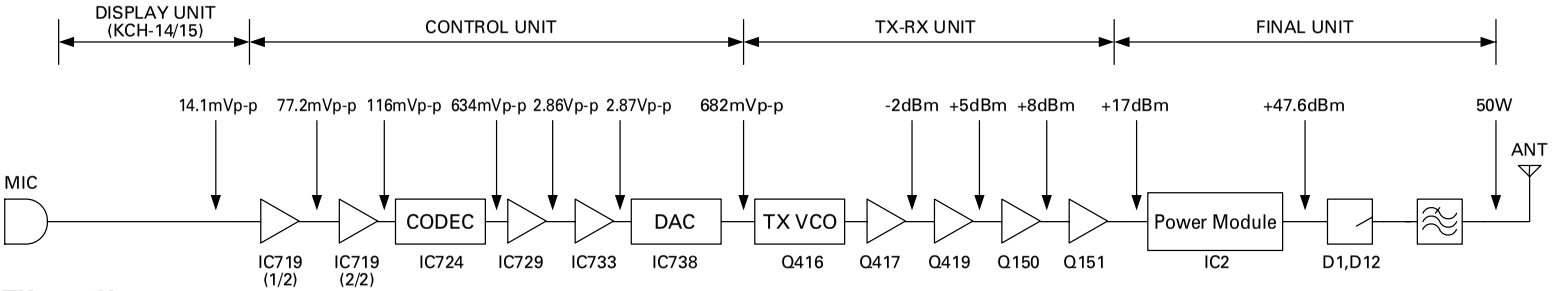




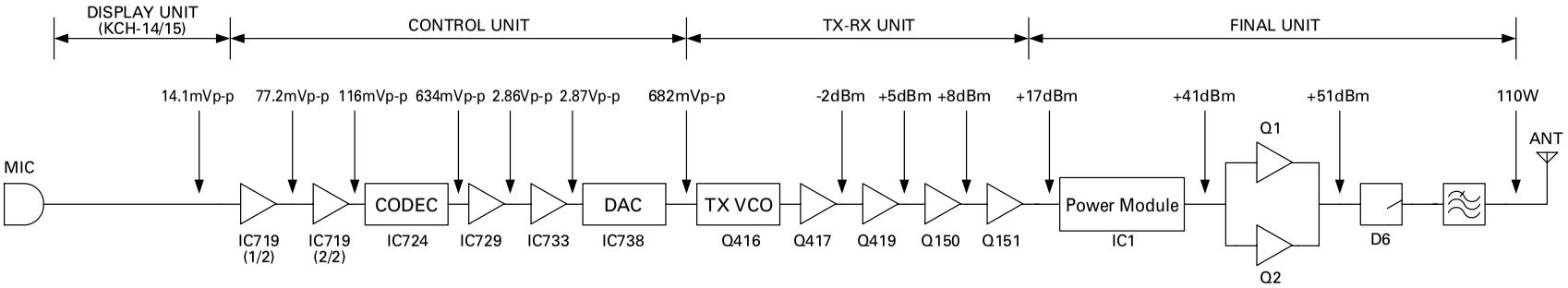
To make measurements in the AF section, connect the AC level meter.
(ANT input: -53dBm, 1kHz FM, 3kHz DEV (WIDE).)
In the RF section, use 1000pF coupling capacitor.
(The display shows the SSG input value required to obtain 12dB SINAD without local level.)

Transmitter Section

TK-5710



TK-5710H



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.

OPTIONAL ACCESSORIES

KCH-14 (Front Panel Kit)

■ External View

KCH-15 (Front Panel Kit)

■ External View

KES-6 (External Speaker)

■ External View

TK-5710(B)/5710H(B)

SPECIFICATIONS

GENERAL

Frequency Range	136~174 MHz	
Number of Channels	512	
Zones	50	
Max. Channels per Zone	250	
Channel Spacing	Analog : 12.5/15/20/25/30 kHz	Digital : 12.5 kHz
Operating Voltage	TK-5710 : 13.6V DC ± 15%	TK-5710H : 13.4V DC ± 15%
Current Drain		
Standby	Less than 0.6A	
Receive	Less than 2.3A	
Transmit	TK-5710 : 12A	TK-5710H : 25A
Duty Cycle	Transmit : 20%	
Operating Temperature Range	–22°F to +140°F (–30°C to +60°C)	
Frequency Stability	±2.0 ppm (–22°F to +140°F)	
Antenna Impedance	50Ω	
Dimensions (W x H x D)		
(Projections included)		
RF Deck only	TK-5710 : 7.01"x 2.36"x 7.68" in.(178 x 60 x 195 mm)	
	TK-5710H : 7.01"x 2.36"x 12.87" in.(178 x 60 x 327 mm)	
with KCH-14 or KCH-15	TK-5710 : 7.05"x 2.36"x 9.09" in.(179 x 60 x 231 mm)	
	TK-5710H : 7.05"x 2.36"x 14.29" in.(179 x 60 x 363 mm)	
Weight (net)		
RF Deck only	TK-5710 : 5.3 lbs.(2.4kg)	TK-5710H : 8.6 lbs.(3.9kg)
with KCH-14	TK-5710 : 5.9 lbs.(2.7kg)	TK-5710H : 9.2 lbs.(4.2kg)
with KCH-15	TK-5710 : 5.9 lbs.(2.7kg)	TK-5710H : 9.2 lbs.(4.2kg)

RECEIVER

Sensitivity	Digital (5% BER) : 0.25µV	Digital(1% BER) : 0.40µV	
	Analog 12dB SINAD : 0.25µV		
Selectivity	Digital : -63dB	Analog @25/30kHz : -83dB/-85dB	Analog @12.5/15kHz : -76dB/-80dB
Intermodulation Distortion	Digital : -80dB	Analog @25/30kHz : -80dB	Analog @12.5/15kHz : -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/8Ω	External:@3% : 12W/4Ω	
	Internal (KCH-14)@5% : 1.625W/8Ω	External:@5% : 13W/4Ω	

TRANSMITTER

RF Output Power	TK-5710 : 50W to 5W	TK-5710H : 110W to 50W
Spurious and Harmonics	80dB	
FM Hum and Noise	Analog @25kHz : 50dB (53dB)*1	Analog @12.5kHz : 45dB (47dB)*1
Microphone Impedance	600Ω	
Audio Distortion	Less than 2%	
Modulation	16K0F3E, 11K0F3E, 8K10F1E, 8K10F1D, 20K0F7D, 11K2F7D, 14K4F1D, 7K20F1D	

*1 ( ) 148~168MHz
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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