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**Does not come with antenna.
Antenna is available as an option.**

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



This product uses Lead Free solder.

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GENERAL

INTRODUCTION

SCOPE OF THIS MANUAL

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

ORDERING REPLACEMENT PARTS

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

PERSONAL SAFETY

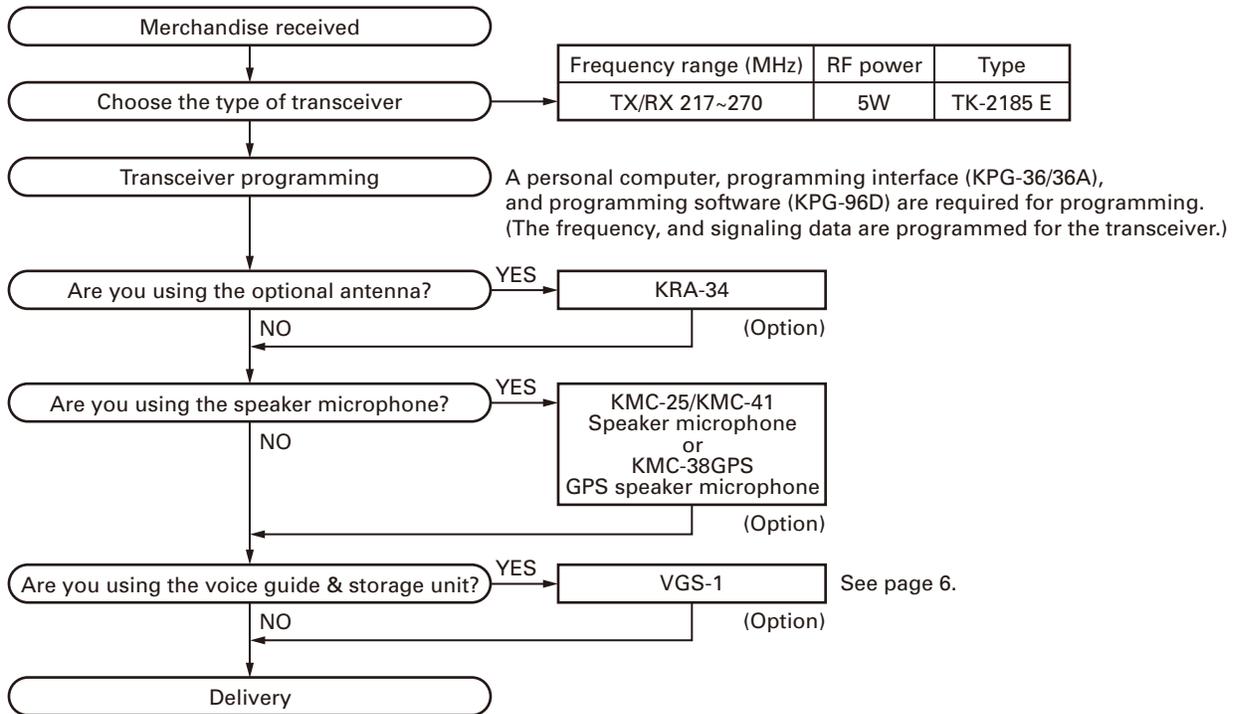
The following precautions are recommended for personal safety:

- DO NOT transmit until all RF connectors are verified secure and any open connectors are properly terminated.
- SHUT OFF and DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.
- This equipment should be serviced by a qualified technician only.

SERVICE

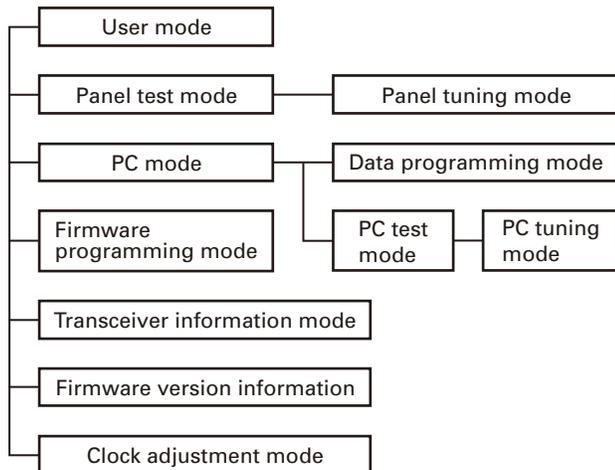
This transceiver is designed for easy servicing. Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained within.

SYSTEM SET-UP



REALIGNMENT

1. Modes



Mode	Function
User mode	For normal use.
Panel test mode	Used by the dealer to check the fundamental characteristics.
Panel tuning mode	Used by the dealer to tune the transceiver.
PC mode	Used for communication between the transceiver and PC.
Data programming mode	Used to read and write frequency data and other features to and from the transceiver.
PC test mode	Used to check the transceiver using the PC. This feature is included in the FPU. See panel test.
PC tuning mode	Used to tune 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.
Transceiver information mode	Used to confirm the MPT ESN, firmware version and transceiver serial number.
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	[A] + Power ON
PC mode	Received commands from PC
Panel tuning mode	[Panel test mode] + [S]
Firmware programming mode	[S] + Power ON
Transceiver information mode	[B] + Power ON
Firmware version information	[Side1] + Power ON
Clock adjustment mode	[C] + 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-36/36A), USB adapter (KCT-53U) and programming software (KPG-96D).

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

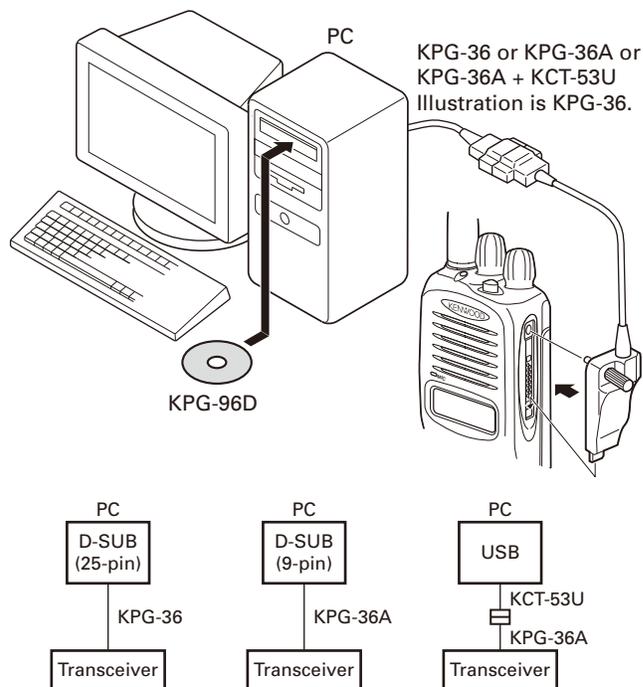


Fig. 1

5-2. Connection procedure

1. Connect the transceiver to the computer using the interface cable and USB adapter (When the interface cable is KPG-36A, the KCT-53U can be used.).

Note:

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

REALIGNMENT

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

Note:

The data stored in the personal computer must match model type, when it is written into the flash memory.

5-3. KPG-36/36A description

(PC programming interface cable: Option)

The KPG-36/36A is required to interface the transceiver to the computer. It has a circuit in its D-sub connector (KPG-36: 25-pin, KPG-36A: 9-pin) case that converts the RS-232C logic level to the TTL level.

The KPG-36/36A connects the universal connector of the transceiver to the RS-232C serial port of the computer.

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

The KCT-53U is a cable which connects the KPG-36A to a USB port on a computer.

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

5-5. Programming software KPG-96D description

The KPG-96D is the programming software for the transceiver supplied on a CD-ROM. This software runs under MS-Windows 98, Me, Windows 2000, XP or Vista (32-bit) on a PC.

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

6. Firmware Programming Mode

6-1. 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.)

6-2. Connection procedure

Connect the transceiver to the personal computer using the interface cable (KPG-36/36A) and USB adapter (KCT-53U: when the interface cable is KPG-36A, the KCT-53U can be used.). (Connection is the same as in the PC Mode.)

6-3. Programming

- Start up the firmware programming software (Fpro.exe (ver. 4.10 or later)). The Fpro.exe exists in the KPG-96D installed holder.
- Set the communications speed (normally, 115200 bps) and communications port in the configuration item.
- Set the firmware to be updated by File name item.

- Turn the transceiver power ON with the [S] switch held down. Then, the orange LED on the transceiver lights and "PROG 115200" is displayed.
- Check the connection between the transceiver and the personal computer, and make sure that the transceiver is in the Program mode.
- Press write button in the window. When the transceiver starts to receive data, the [PG] display is blinking.
- If writing ends successfully, the checksum is calculated and a result is displayed.
- 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.

6-4. Function

- If you press the [Side2] switch (under of left side) while "PROG 115200" is displayed, the display changes to "PROG 19200" to indicate that the write speed is low speed (19200 bps). If you press the [Side2] switch again while "PROG 19200" is displayed, the display changes to "PROG 38400". If you press the [Side2] switch again while "PROG 38400" is displayed, the display changes to "PROG 57600". If you press the [Side2] switch again while "PROG 57600" is displayed, the display returns to "PROG 115200".
- If you press the [Side1] switch (top of left side) while "PROG 115200" is displayed, the checksum is calculated, and a result is displayed. If you press the [Side1] switch again while the checksum is displayed, "PROG 115200" is redisplayed.

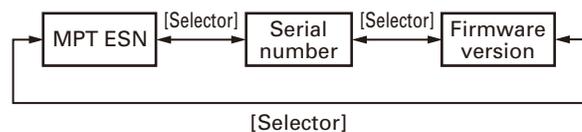
Note:

Normally, write in the high-speed mode.

7. Transceiver Information Mode

Use this function to confirm the MPT ESN, firmware version and transceiver serial number.

- Press and hold the [B] key while turning the transceiver power ON.
- Use the [Selector] to select the confirmation items.
- To exit the transceiver information mode, turn the transceiver power OFF.



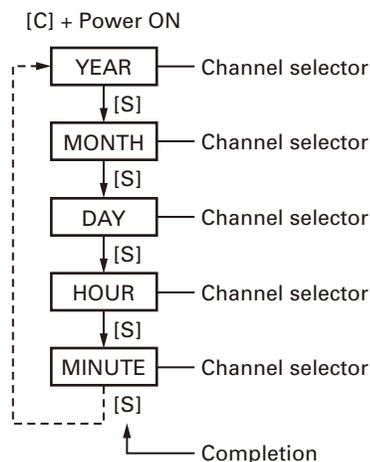
REALIGNMENT

8. Firmware Version Information

Turn the transceiver ON with the [Side1] switch held down. Then, the version is displayed during holding the [Side1] switch.

9. Clock Adjustment Mode

9-1. Flow chart of operation

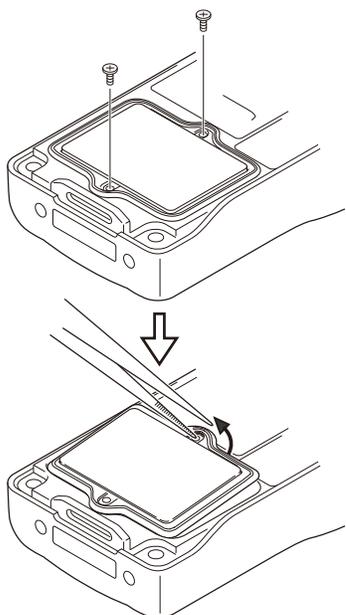


INSTALLATION

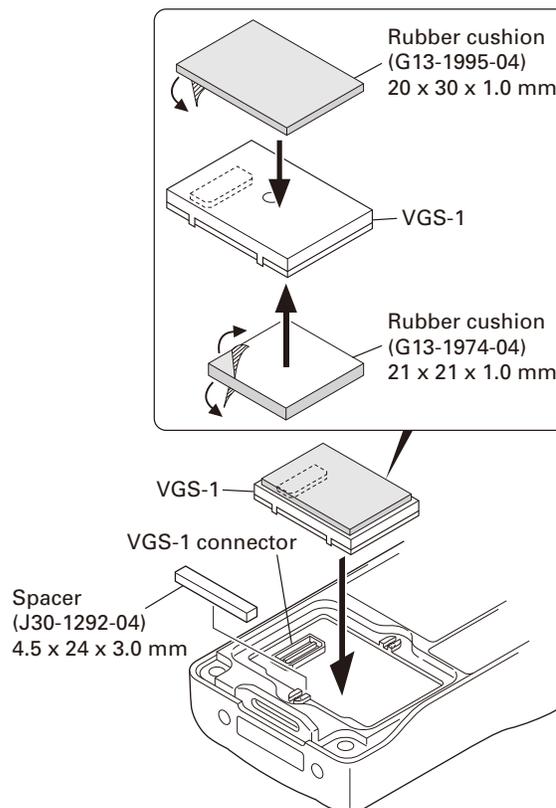
1. Voice Guide & Storage Unit (VGS-1: Option)

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

1. Remove the two screws.
2. The tip of tweezers is put into the screw hole of the cover and is pried, the cover will remove.
3. Use the two rubber cushions and attach them to the VGS-1.
4. Plug the VGS-1 into the VGS-1 connector of the PC board, pressing down on the top of the VGS-1 until secure.



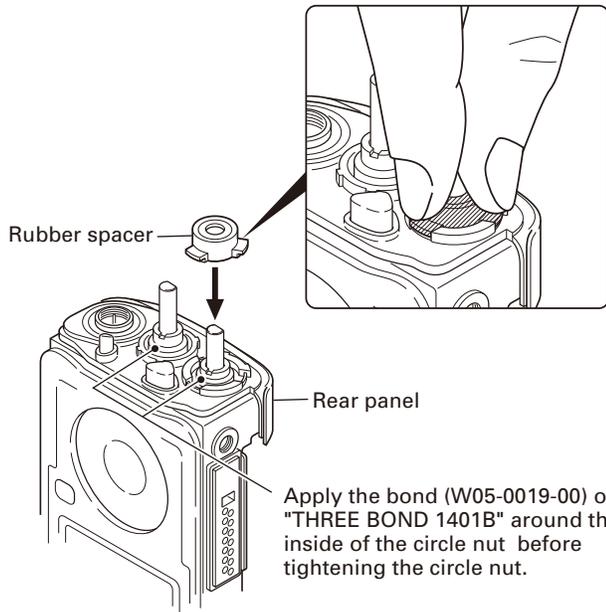
5. The spacer turns the adhesive surface down. Next, push between the chassis and VGS-1.
6. Replace the cover and tighten the two screws.



DISASSEMBLY FOR REPAIR

1. How to Attach the Rubber Spacer

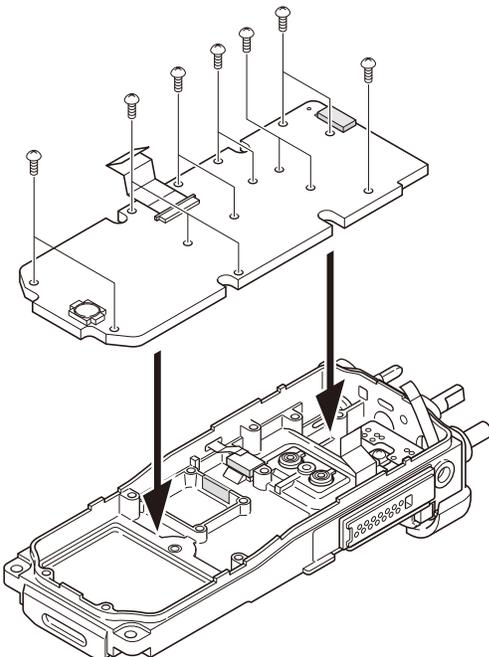
Press the rubber spacer with fingers and insert it between the rubber spacer and the rear panel without crevice.



2. How to Attach the TX-RX Unit

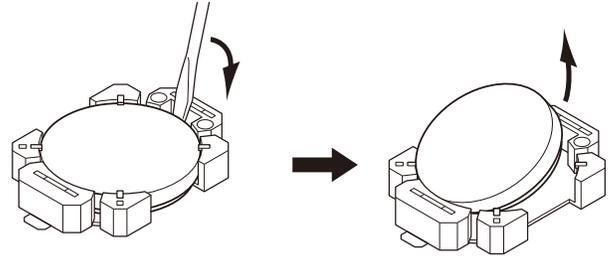
In order to attach the TX-RX unit in chassis, don't put in the TX-RX unit aslant.

Please level the chassis and the TX-RX unit and attach them.



3. Removing the lithium cell (W09-0971-05)

Insert a non-conductive screwdriver to groove of one side of the socket (CN501) and pry the lithium cell up from the socket.



4. Installing the lithium cell (W09-0971-05)

Insert a lithium cell into one side of the socket (CN501). Push the lithium cell to insert the lithium cell into the socket.



CIRCUIT DESCRIPTION

1. Overview

This transceiver is VHF/FM portable transceiver designed to operate in the frequency range of 217 to 270MHz.

2. Circuit Configuration by Frequency

The receiver is a double-conversion superheterodyne with a first intermediate frequency (IF) of 59.85MHz and a second IF of 455kHz. Incoming signals from the antenna are mixed with the local signal from the PLL to produce the first IF of 59.85MHz.

This is then mixed with the 59.395MHz second local oscillator output to produce the 455kHz second IF. This is detected to give the demodulated signal.

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

3. Receiver System

3-1. RF unit

An incoming RF signal from the antenna terminal is passed through the antenna switch (D106, D107, D211 and D213 are off) and then the bandpass filter (L215, L216). The bandpass filter is adjusted by a variable capacitor. The input voltage to the variable capacitor is regulated by the voltage output from the D/A converter (IC605). The signal is amplified by RF amplifier (Q207), and passed through the bandpass filter (L211, L214).

The resulting signal is applied to the first mixer (Q206), where it is mixed with the first local oscillator signal output from the frequency synthesizer to produce the first IF (59.85MHz).

3-2. IF unit

The first IF signal is passed through a four-pole monolithic crystal filter (XF200) to remove a adjacent channel signal. The filtered first IF signal is amplified by the first IF amplifier (Q205) and then applied to the IF system IC (IC200). The IF system IC provides a second mixer, second local oscillator, limiting amplifier, quadrature detector and RSSI (Received Signal Strength Indicator). The second mixer mixes the first IF signal with the 59.395MHz of second local oscillator output (crystal unit X200) and produces the second IF signal of 455kHz.

The second IF signal is passed through the ceramic filter (CF201 : Wide, CF200 : Narrow) to more remove the adjacent channel signal. The filtered second IF signal is amplified by the limiting amplifier and demodulated by the quadrature detector with ceramic discriminator (CD200). The demodulated signal is routed to the audio circuit.

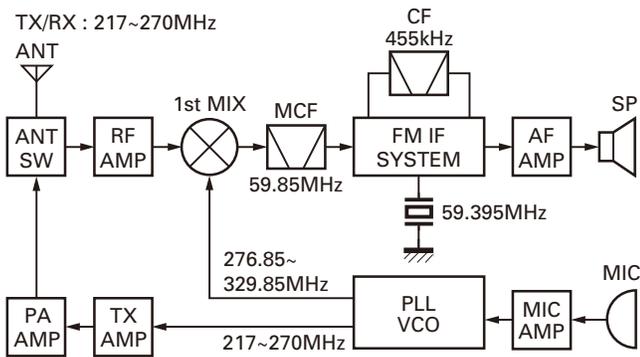


Fig. 1 Frequency configuration

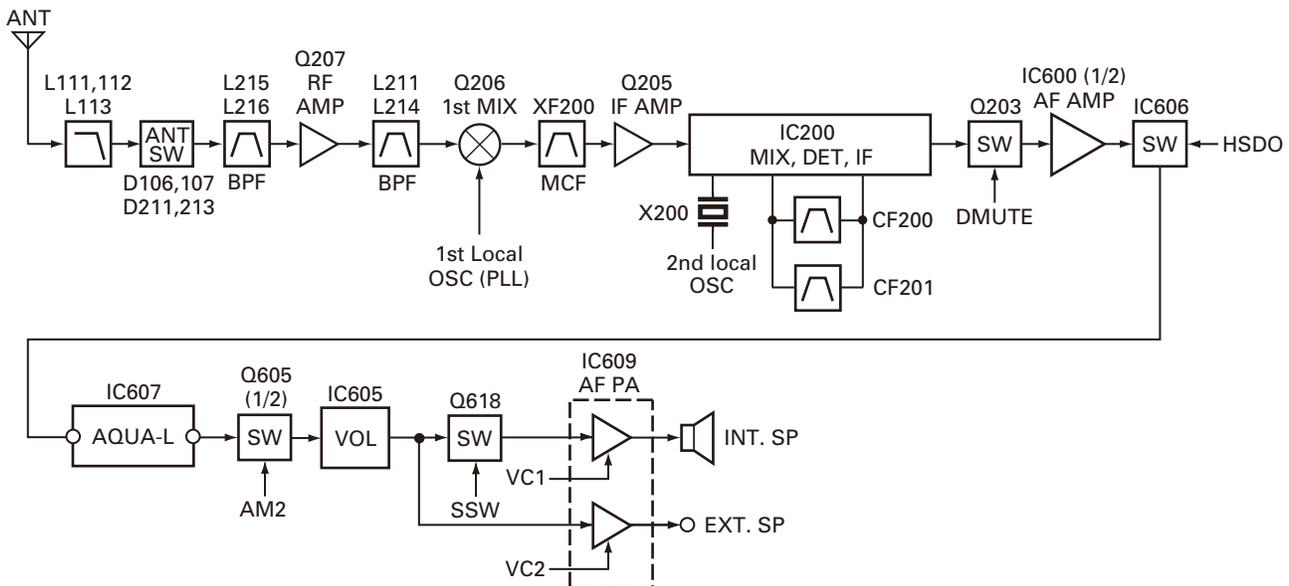


Fig. 2 Receiver section

CIRCUIT DESCRIPTION

3-3. Wide/Narrow switching circuit

Wide and Narrow settings can be made for each channel by switching the ceramic filters CF201 (Wide), CF200 (Narrow). The Wide (low level) and Narrow (high level) is output from IC502.

When a Wide (low level) is selected, Q200 (N-ch) turn off and Q200 (P-ch) turn on. When a Narrow (high level) is selected, Q200 (N-ch) turn on and Q200 (P-ch) turn off. D201 and D203 are switched to ceramic filters when a high/low level is selected.

Q204 turns on/off with the Wide/Narrow and the IC200 detector output level is changed to maintain a constant output level during wide or narrow signals.

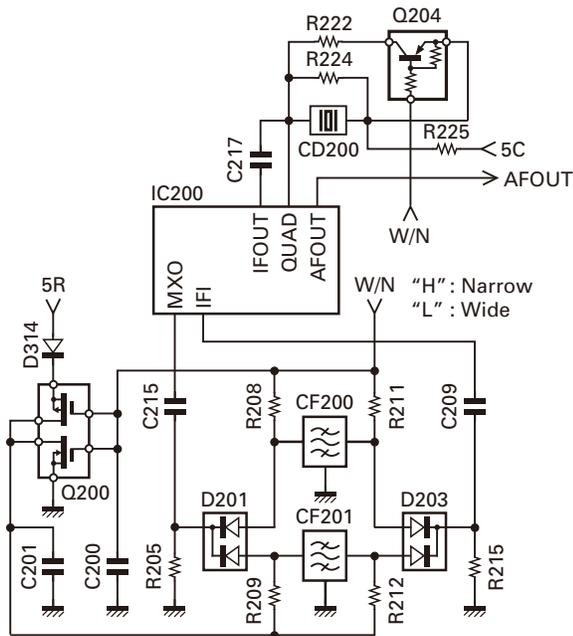


Fig. 3 Wide/Narrow switching circuit

3-4. Audio amplifier circuit

The demodulated signal from IC200 goes through the mute switch (Q203), IC600 (1/2) and IC606, high-pass filtered, low-pass filtered, high-pass filtered and de-emphasized by IC607.

The signal then goes through mute switch (Q605 1/2), and an electronic volume control (IC605), and an AF switch (Q618 is on), and is routed to audio power amplifier (IC609), where it is amplified and output to the internal speaker.

The audio mute signal (AM1) from the IC502 becomes Low in the standby and Q612, Q613 which are power supply circuit for IC609 turn off. Also, the audio mute signal (AM2) becomes High to turn Q605 (1/2) off. When the audio is output, AM1 becomes High to turn Q612, Q613 on, and voltage is supplied to power terminal VP of IC609. Also, AM2 becomes Low to turn Q605 (1/2) on.

The speaker is switched by the logic of speaker switching terminal SSW on the universal connector. When SP-MIC is not attached, the logic of SSW becomes High and SW (Q618) is turned on, and the AF signal is input to both amplifiers of IC609.

When SP-MIC is attached, SSW is connected to GND at inside of SP-MIC. For this reason, Q618 is turned off, and the AF signal is input only to amplifier for EXT SP of IC609.

Change of INT/EXT SP refer to Fig. 4.

AM1	AM2	SSW	VC1	VC2	SP
H	L	H	H	L	INT
H	L	L	L	H	EXT
L	H	H	L	L	MUTE
L	H	L	L	L	MUTE

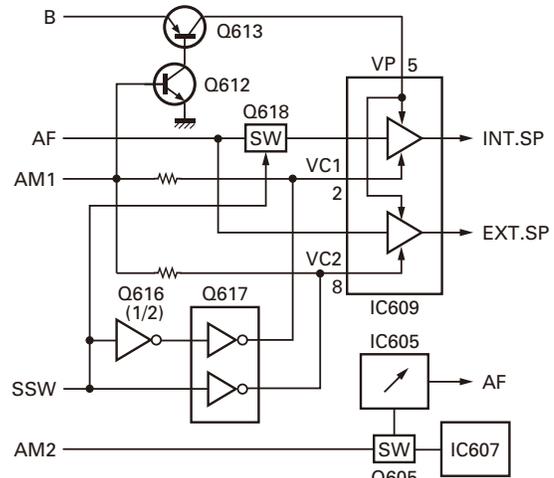


Fig. 4 Audio amplifier circuit

3-5. Squelch circuit

The output from IC200 enters FM IC again, then passed through a bandpass filter. The noise component output from IC200 is amplified by Q201 and rectified by D202 to produce a DC voltage corresponding to the noise level. The DC voltage is sent to the analog port of the CPU (IC502). And IC200 outputs a DC voltage (RSSI) corresponding to the input of the IF amplifier. The CPU reads the RSSI signal via pin 125.

IC502 determines whether to output sounds from the speaker by comparing the input voltage of pin 124 and pin 125 with the preset value.

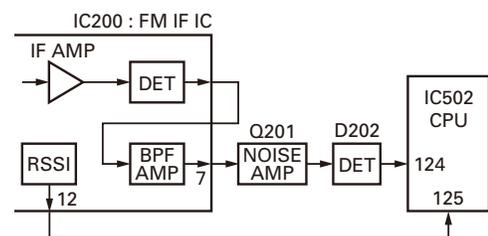


Fig. 5 Squelch circuit

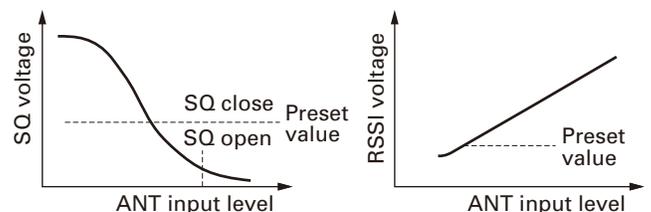


Fig. 6 Squelch and RSSI voltage vs ANT input level

CIRCUIT DESCRIPTION

4. Transmitter System

4-1. Microphone amplifier

The signal from the internal microphone goes through the mute switch (Q614).

When the SP-MIC is not attached, the microphone switching terminal (MSW) on the universal connector becomes High, and mute switch (Q614) is turned on. When the SP-MIC is attached, MSW is connected to GND at inside of SP-MIC. For this reason, Q614 is turned off, the internal microphone is muted, and only the input of the external microphone is supplied to the microphone amplifier.

The signal from microphone goes through D/A converter (IC605), mute switch (Q610), and amplified by IC608 (1/2) and limited by AGC circuit composed of D601, D602, Q606 and Q607. IC607 is composed of high-pass filter, low-pass filter and pre-emphasis/IDC circuit.

The signal passes through the D/A converter (IC605) for the maximum deviation adjustment, and enters the summing amplifier consisting of IC600 (2/2), and is mixed with the low speed data from the CPU (IC502).

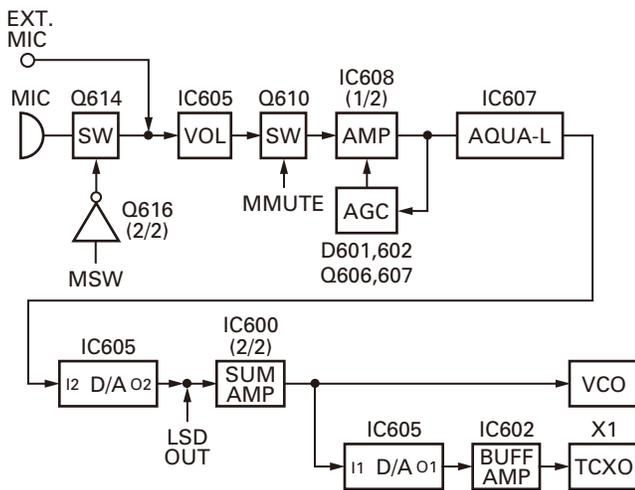


Fig. 7 Microphone amplifier

The output signal from the summing amplifier goes to the VCO modulation input. The other output signal from the summing amplifier passes through the D/A converter (IC605) again for the BAL adjustment, and the buffer amplifier (IC602), and goes to the TCXO modulation input.

4-2. Drive and Final amplifier

The signal from the T/R switch (D100 is on) is amplified by drive amplifier (Q101 and Q102) to +15~17dBm.

The output of the drive amplifier is amplified by the RF power amplifier (Q105) to 5.0W (1W when the power is low). The RF power amplifier is MOS FET. The output of the RF power amplifier is then passed through the harmonic filter (LPF) and antenna switch (D106, D107 are on) and applied to the antenna terminal.

4-3. APC circuit

The APC circuit always monitors the current flowing through the RF power amplifier (Q105) and keeps a constant current. The voltage drop at R125, R127 and R130 is caused by the current flowing through the RF power amplifier and this voltage is applied to the differential amplifier (IC100 1/2).

IC100 (2/2) compares the output voltage of IC100 (1/2) with the reference voltage from IC502, and the output of IC100 (2/2) controls the VGG of Q101, Q102 and Q105 to make the both voltages to same voltage.

The change of power high/low is carried out by the change of the reference voltage. Q106, Q107 and Q108 are turned on and Q104 is turned off in transmit and the APC circuit is active.

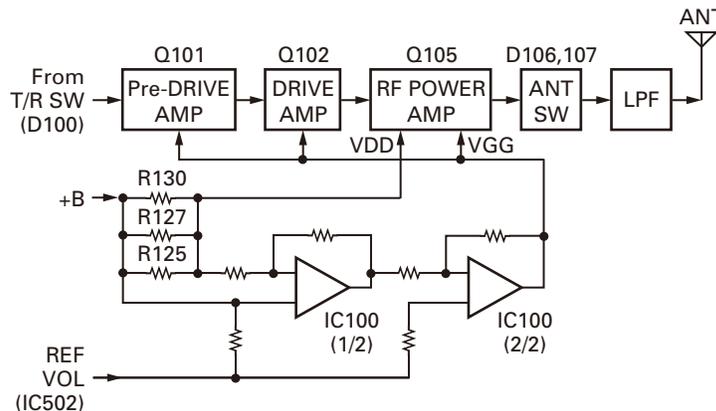


Fig. 8 Drive and final amplifier and APC circuit

CIRCUIT DESCRIPTION

5. Frequency Synthesizer Unit

5-1. Frequency synthesizer

The frequency synthesizer consists of the TCXO (X1), VCO, PLL IC (IC1) and buffer amplifiers.

The TCXO generates 16.8MHz. The frequency stability is 2.5ppm within the temperature range of -30 to $+60^{\circ}\text{C}$. The frequency tuning and modulation of the TCXO are done to apply a voltage to pin 1 of the TCXO. The output of the TCXO is applied to pin 8 of the PLL IC.

The VCO consists of 2VCO and covers a dual range of the 276.85~329.85MHz and the 217~270MHz. The VCO generates 276.85~329.85MHz for providing to the first local signal in receive. The operating frequency is generated by Q7 in transmit mode and Q6 in receive mode. The oscillator frequency is controlled by applying the VCO control voltage, obtained from the phase comparator (IC1) to the variable capacitor diodes (D9 and D13 in transmit mode and D7 and D11 in receive mode).

The T/R pin of IC502 goes "high" in receive mode causing Q8 and Q7 to turn off, and Q6 turn on. The T/R pin goes "low" in transmit mode.

The outputs from Q6 and Q7 are amplified by buffer amplifier (Q10) and doubled by Q2 and then sent to PLL IC.

The PLL IC consists of a prescaler, reference divider, phase comparator, charge pump (The frequency step of the PLL circuit is 10 or 12.5kHz). The input signal from the pins 8 and 5 of the PLL IC is divided down to the 10 or 12.5kHz and compared at phase comparator. The pulsed output signal of the phase comparator is applied to the charge pump and transformed into DC signal in the loop filter (LPF). The DC signal is applied to the CV of the VCO and locked to keep the VCO frequency constant.

PLL data is output from DT (pin 112), PCK (pin 82) and PLE (pin 81) of the microprocessor (IC502). The data are input to the PLL IC when the channel is changed or when transmission is changed to reception and vice versa. A PLL lock condition is always monitored by the pin 80 (UL) of the microprocessor. When the PLL is unlocked, the UL goes low.

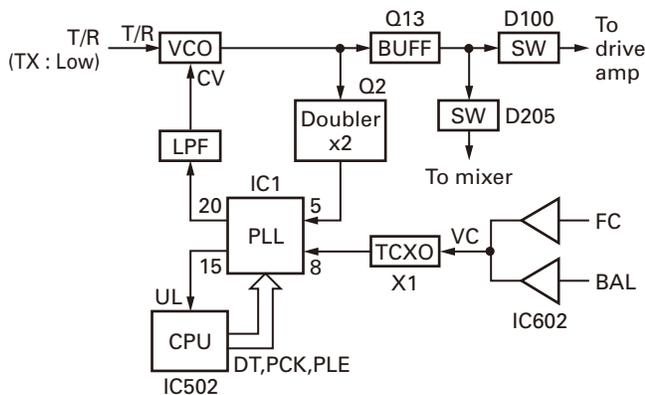


Fig. 9 PLL block diagram

6. Control Circuit

The control circuit consists of microprocessor (IC502) and its peripheral circuits. It controls the TX-RX unit and transfers data to the Display unit. IC502 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) Transmitting tone and encode data.

6-1. Memory circuit

Memory circuit consists of the CPU (IC502) and a flash memory (IC500). A flash memory has a capacity of 4M 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 (IC504) stores the last channel data, the scan on status, and other parameters.

■ Flash memory

Note :

The flash memory stores the data that is written by the FPU (KPG-96D), and firmware program (User mode, Test mode, Tuning mode, etc.). This data must be rewritten when replacing the flash memory.

■ EEPROM

Note :

The EEPROM 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 (IC503). When the power supply is off, it is backed up by an internal secondary lithium battery.

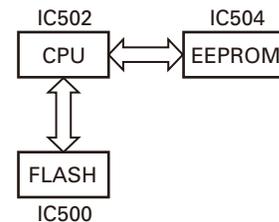


Fig. 10 Memory circuit

CIRCUIT DESCRIPTION

6-2. Low battery warning

The battery voltage is monitored by the microprocessor (IC502 pin 126 : BATTLVL). When the battery voltage falls below the voltage set by the Low Battery Warning adjustment during the transmission, the red LED blinks to notify the operator that it is time to replace the battery (When the "While Transmitting" option (default setting) under the Battery Warning / status function in the FPU is selected.). If the battery voltage falls below 5.8V, the transceiver does not transmit and the warning tone beeps while the PTT switch is pressed.

Low battery warning	Battery condition
The red LED blinks during the transmission.	The battery voltage is low but the transceiver is still usable.
The red LED blinks and the warning tone beeps while the PTT switch is pressed.	The battery voltage is low and the transceiver is not usable to make calls.

6-3. Battery type detection

The transceiver automatically detects the battery type, measuring the resistance between the S-terminal and GND terminal on the battery pack and changes the supplied voltage to the S-terminal as below. The microprocessor then detects the battery type.

Resistor value	Battery type	Input voltage of S-terminal
150kΩ	Ni-MH	2.0~3.34V
47kΩ	Li-ion	0.8~2.0V
Short	Battery case	0~0.8V

6-4. Key input

When any key is pressed, K11 or K12 become Low. And CPU (IC502) set Q1 to Q9 "Low" sequentially. The CPU detects which key is pressed, according to the voltage of K11 and K12 and Q1 to Q9 timing.

7. Signaling Circuit

7-1. Encode

■ Low-speed data (QT, DQT)

Low-speed data is output from pin 33 of the CPU. The signal passes through a low-pass filter (IC601 1/2), and goes to the summing amplifier (IC600 2/2). The signal is mixed with the audio signal and goes to the VCO and TCXO (X1) modulation input after passing through the D/A converter (IC605) for BAL adjustment.

■ High-speed data (DTMF)

High-speed data (HSD) is output from pin 7 of the CPU. The signal passes through a low-pass CR filter and provides a TX HSD tone and a RX HSD tone. TX HSD deviation making an adjustment by microprocessor is passed through the switch (IC606) and then applied to the audio processor (IC607).

The signal is mixed with the audio signal and goes to the VCO and TCXO. The RX HSD tone is passed a summing amplifier (IC607). The D/A converter (IC605) for audio control, audio power amplifier and then to the speaker.

■ MSK

MSK signal is output from pin 6 of IC607. The signal passes through the D/A converter (IC605) for the MSK deviation adjustment, and is routed to the VCO. When encoding MSK, the microphone input signal is muted.

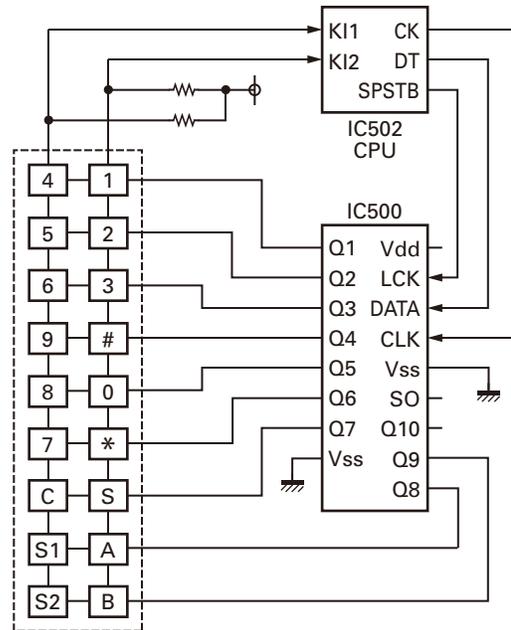


Fig. 11 Key input

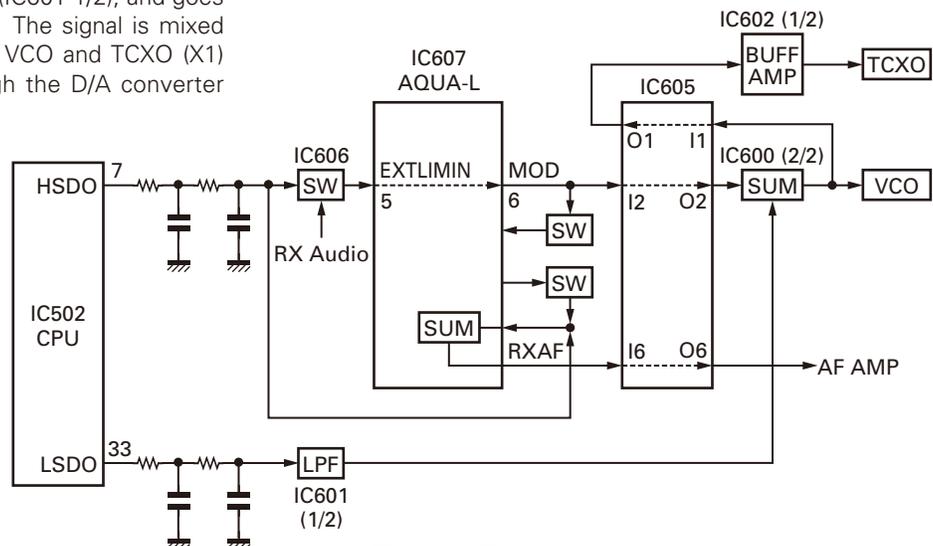


Fig. 12 Encode

CIRCUIT DESCRIPTION

7-2. Decode

■ Low-speed data (QT, DQT)

The demodulated signal from the IF IC (IC200) is amplified by IC600 (1/2) and passes through a low-pass filter (IC607) to remove audio components. The signal is input to pin 128 of the CPU.

The CPU digitizes this signal, performs processing such as DC restoration, and decodes the signal.

■ High-speed data (DTMF)

The DTMF input signal from the IF IC (IC200) is amplified by IC600 (1/2) and goes to IC607, the DTMF decoder. The decoded information is then processed by the CPU. During transmission and standby, the DTMF IC is set to the power down mode.

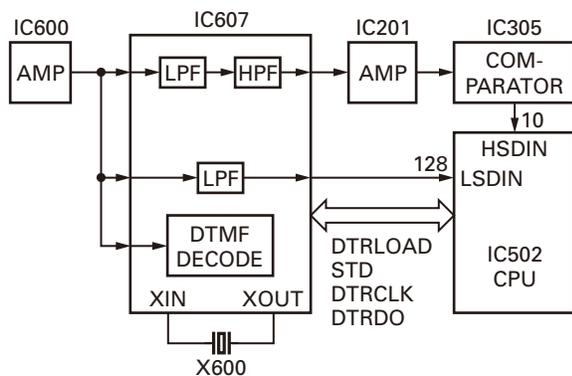


Fig. 13 Decode

■ MSK

The MSK input signal from the IF IC is amplified by IC600 (1/2) and goes to pin 5 of IC607. The signal is demodulated by MSK demodulator in IC607. The demodulated data goes to the CPU for processing.

8. Power Supply Circuit

Battery +B is supplied via a 2.5A fuse from the battery terminal connected to the TX-RX unit. Power supply (+B) is applied to the four AVRs. IC402 supplies 5V (5M) to the control circuit. IC401 and IC403 supplies 5V to common circuits. IC406 supplies to the TX circuit, the RX circuit and common circuits. During transmission, 5TC becomes Low and Q406 is turned on to supply 5V (5T) to the TX circuit. During reception, 5RC becomes Low and Q405 is turned on to supply 5V (5R) to the RX circuit.

The power supply voltage monitor IC (IC400) monitors power supply voltage (+B). If the voltage falls (less than 5.6V), the VOUT port goes "LOW" level, the CPU INT port also goes "HIGH" level, and the CPU stops.

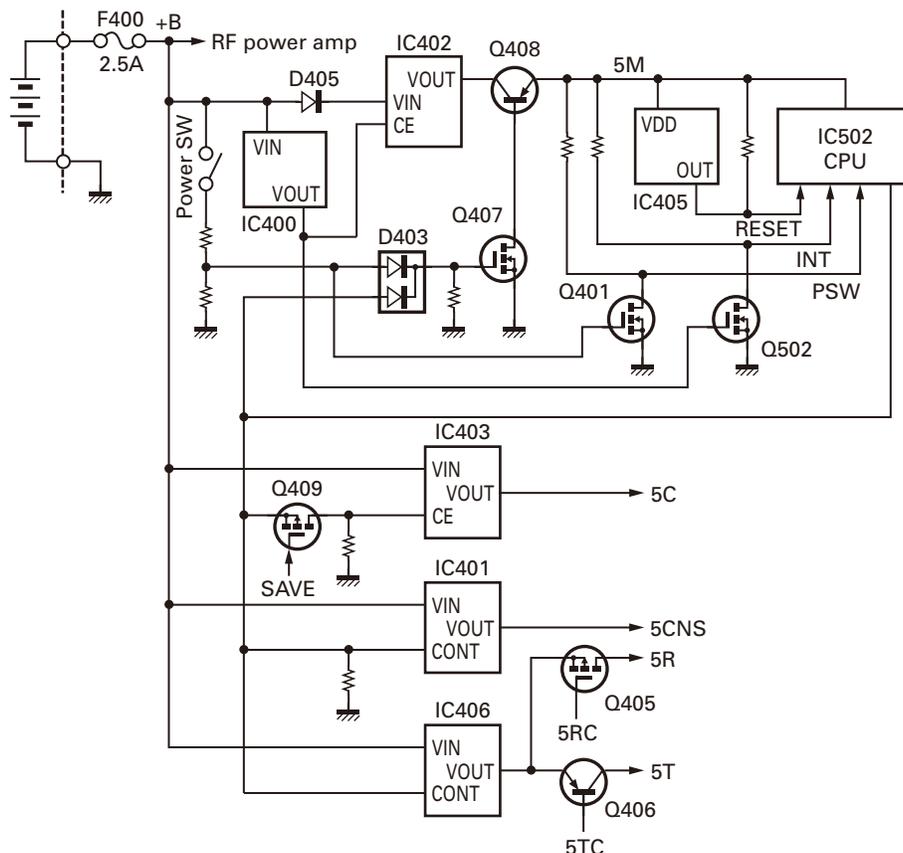


Fig. 14 Power supply circuit

SEMICONDUCTOR DATA

Microprocessor : 30625MGP169GU (TX-RX unit IC502)

Pin No.	Port Name	I/O	Function
1	VREF	-	+5V
2	AVCC	-	+5V
3	SBC	O	Switched B control
4	5RC	O	RX control
5	5TC	O	TX control
6	APC/TV2	O	TX APC adjust / TV adjust 2
7	HSDO	O	High speed data output
8	STSW	O	Side tone switch
9	RTCL/EEPCL	O	RTC/EEPROM clock
10	HSDIN	I	High speed data input
11	MAN-DN IN	I	Man down switch input
12	RTDT/EEPDAT	I/O	RTC/EEPROM data
13	BYTE	-	+5V
14	CNVSS	-	DGND (Vss)
15	DMUTE	O	Det mute
16	AM2	O	Audio mute 2
17	RST	I	Reset
18	Xout	O	11.0592MHz clock output
19	DGND	-	DGND (Vss)
20	Xin	I	11.0592MHz clock input
21	VCC1	-	+5V
22	NMI	-	+5V
23	PSW	I	Power switch input
24	INT	I	BATT voltage INT
25	INTRA	I	RTC INT
26	SHIFT/MODEL	I/O	Beat shift (CPU) / Model select
27	BEEP	O	Beep out
28	SPSTB	O	BU2099 storage enable
29	VCO ADJ	O	VCO adjust switch
30	LEDR	O	LED red
31	LEDG	O	LED green
32	DSTB	O	STB for DAC
33	LSDO	O	Low speed data output
34	KEY1	I	Key matrix 1 input
35	KEY2	I	Key matrix 2 input
36	TXD1	I/O	TXD1 and PTT (Scrambler board)
37	Vcc1	-	+5V
38	RXD1	I	RXD1
39	DGND	-	DGND (Vss)
40	MMUTE	O	MIC mute

Pin No.	Port Name	I/O	Function
41	AUX	I	AUX key
42	TXD	O	TXD (COM0)
43	RXD	I	RXD (COM0)
44	AFDAT	O	BB TDATA and DTRCLK
45	AFDIO	I/O	BB DI/O
46	AFDIR	O	BB DIR
47	DTRLOAD	O	BB DTMF enable
48	AFSTD	I	BB STD
49	LSW	O	BB LIM switch
50	RDY	-	+5V
51	NC	-	No connection
52	HOLD	-	+5V
53	NC	-	No connection
54~57	EN4~EN1	I	Encoder in 4~1
58	NC	O	No connection
59	RD	O	Read (RD)
60	NC	O	No connection
61	WR	O	Write (WR)
62	APCSW	O	APC switch output
63	DSW	O	APC voltage discharge switch
64	5UC	O	5U control
65	BTSE/VOX	O	BATT select / VOX input switch
66	LCDRST	O	LCD reset
67	LCDCS	O	LCD chip select
68	CS0	O	Chip select 0
69	NC	-	No connection
70~79	A18~A9	O	Address bus 18~9
80	UL	I	PLL unlock
81	PLE	O	PLL enable
82	PCK	O	PLL clock
83	BB_SFT	O	Beat shift (AQUA-L)
84	OPT6	O	Option board I/F 6
85	VCC2	-	+5V
86	A8	O	Address bus 8
87	DGND	-	DGND (Vss)
88~95	A7~A0	O	Address bus 7~0
96	PTT	I	PTT input
97	AFRTM	I	BB RDF/FD
98	TCLK/DTRDO	I	BB TCLK and DTRDO
99	SAVE	O	Save

SEMICONDUCTOR DATA / COMPONENTS DESCRIPTION

Pin No.	Port Name	I/O	Function
100	T/R	O	TX/RX switch
101	AM1	O	AF PA switch
102	LCDRS	O	LCDRS
103	SSW	I	EXT/INT speaker switch input
104~111	D7~D0	I/O	Data bus 7~0
112	DT	O	Serial data
113	CK	O	Serial clock
114	W/N	O	Wide/Narrow switch
115~119	OPT 1~OPT 5	I/O	Option board I/F 1~5
120	BATTSEL/VOX	I	BATT select and VOX input
121	THP/VCO ADJ	I	Thermal detect and VCO adjust
122	VOL	I	Volume level input
123	PF	I	PF key in
124	ASQ	I	RX analog squelch input
125	RSSI	I	RX RSSI input
126	BATT LVL	I	BATT level
127	AGND	-	DGND (Vss)
128	LSDIN	I	Low speed data input

Key Processor

: BU2099FV (Display unit IC500)

Pin No.	Port Name	I/O	Function
1	Vss	-	GND
2	NC	-	No connection
3	DATA	I	Serial data input
4	CLK	I	Serial clock input
5	LCK	I	Storage enable input
6	Q0	O	LCD back light control
7~15	Q1~Q9	O	Key matrix output
16	Q10	O	No connection
17	Q11	O	No connection
18	SO	O	No connection
19	OE	I	/LCDRST
20	VDD	I	5V

Display unit (X54-3472-72)

Ref. No.	Part name	Description
IC500	IC	Key processor
IC501	IC	Voltage regulator / LCD
IC502,503	IC	LCD control
Q501,502	Transistor	Back light control
Q504	FET	LCD reset
Q505	FET	Contrast control
D500	Diode	Contrast control
D501,502	LED	Key back light
D511~516	LED	Key back light
D517~520	LED	LCD back light
D522	Diode	Key control

TX-RX unit (X57-6932-72)

Ref. No.	Part name	Description
IC1	IC	PLL system
IC100	IC	Comparator (APC)
IC200	IC	FM IF system
IC400	IC	Voltage detector / INT
IC401~403	IC	Voltage regulator / 5V
IC404	IC	5T control
IC405	IC	Voltage detector / Reset
IC406	IC	Voltage regulator / 5V
IC500	IC	Flash memory
IC502	IC	Microprocessor
IC503	IC	RTC processor
IC504	IC	EEPROM
IC505	IC	Selector
IC600	IC	AF buffer
IC601	IC	LSD LPF / V REF
IC602	IC	LSD buffer to TCXO
IC603	IC	Tune
IC604	IC	HSD BPF / HSD COMP
IC605	IC	D/A converter
IC606	IC	AF switch
IC607	IC	AQUA-L
IC608	IC	MIC AMP / VOX
IC609	IC	AF power AMP
Q1	Transistor	Fin filter shift switch
Q2	Transistor	PLL IC f_in AMP
Q6	FET	VCO / RX
Q7	FET	VCO / TX
Q8	FET	DC switch / TX VCO

COMPONENTS DESCRIPTION

Ref. No.	Part name	Description
Q9	FET	DC switch / RX VCO
Q10	Transistor	RF buffer AMP
Q11	Transistor	Ripple filter
Q12	FET	DC switch / RX VCO
Q13	Transistor	RF AMP
Q14	Transistor	Fin filter shift switch
Q101	FET	Pre-drive AMP
Q102	FET	TX drive AMP
Q104	Transistor	APC switch
Q105	FET	TX final AMP
Q106	Transistor	APC switch
Q107	FET	APC switch
Q108	Transistor	APC switch
Q200	FET	W/N filter shift switch
Q201	Transistor	SQL noise AMP
Q202	FET	W/N noise switch
Q203	FET	AF mute
Q204	Transistor	W/N switch / RX
Q205	Transistor	IF AMP
Q206	FET	Mixer
Q207	FET	RF AMP
Q400	Transistor	LED switch / Green or Red
Q401	FET	Power switch
Q402	FET	SBC switch
Q403	Transistor	SB2 switch
Q404	Transistor	5R switch
Q405	FET	5R switch
Q406	Transistor	5T switch
Q407	FET	5M switch
Q408	Transistor	5M switch
Q409	FET	SAVE switch
Q502	FET	INT switch
Q602	Transistor	LIMIT switch
Q605	Transistor	AF switch
Q606,607	Transistor	MIC AGC
Q608	FET	AF switch
Q609	FET	OP switch
Q610	FET	MMUTE switch
Q611	FET	OP switch
Q612,613	Transistor	SP control
Q614	FET	MIC shift switch
Q615	Transistor	SP control
Q616,617	FET	AF mute
Q618	FET	SP control
Q619	FET	Side tone switch
Q620	Transistor	Side tone switch

Ref. No.	Part name	Description
Q621	Transistor	Beat shift switch (CPU)
Q622	Transistor	5UC switch
Q623,624	FET	5UC switch
Q625,626	Transistor	Beat shift switch (AQUA-L)
D1~4	Diode	T / R switch
D7,11	Variable capacitance diode	Frequency control / RX VCO
D9,13	Variable capacitance diode	Frequency control / TX VCO
D17	Variable capacitance diode	Modulator
D18	Diode	Current steering
D100	Diode	TX/RX RF switch
D103	Zener diode	APC protect
D106,107	Diode	ANT switch
D108	Zener diode	APC switch
D200	Diode	SQL control
D201	Diode	Filter switch
D202	Diode	SQL detector
D203	Diode	Filter switch
D204	Diode	DMUTE control
D205	Diode	TX/RX RF switch
D207~210	Variable capacitance diode	RF BPF tuning
D211,213	Diode	ANT switch
D314	Diode	5R protector
D400	LED	LED Red & Green
D402	Diode	Reverse current prevention
D403	Diode	Power switch control
D404	Diode	Batt level control
D405	Diode	5M protector
D406	Diode	5M control
D408	Diode	5T control
D500~502	Diode	RTC BATT control
D600	Diode	AF BUFFER control
D601~603	Diode	Detector
D604	Zener diode	MIC shift control
D605	Diode	SP control
D606	Zener diode	MIC shift control
D607	Zener diode	SP control
D608	Zener diode	MIC shift control
D609	Diode	RXD control
D610	Diode	TXD control
D611	Zener diode	PTT PF TXD RXD control
D612	Zener diode	OPT control
D613	Diode	SSW control
D614	Diode	SP control

PARTS LIST

* New Parts. Δ indicates safety critical components.

Parts without **Parts No.** are not supplied.Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.Teile ohne **Parts No.** werden nicht geliefert.

L : Scandinavia

Y : PX (Far East, Hawaii)

Y : AAFES (Europe)

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

TK-2185 (Y50-5872-72)

DISPLAY UNIT (X54-3472-72)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
TK-2185						DISPLAY UNIT (X54-3472-72)					
1	1A	*	A02-3848-33	PLASTIC CABINET ASSY		E	3B		N14-0810-04	CIRCULAR NUT (SELECTOR)	
2	3A	*	A10-4076-41	CHASSIS		F	2A,3A		N30-2004-43	PAN HEAD MACHINE SCREW (OPB/FET)	
3	3B	*	A62-1093-12	PANEL (TOP)		G	2B		N30-2604-48	PAN HEAD MACHINE SCREW (ANT)	
5	2D		B09-0625-03	CAP ACCESSORY		H	2C		N30-3008-60	PAN HEAD MACHINE SCREW (CLIP)	
6	2A	*	B10-2764-02	FRONT GLASS		J	2A,2B		N83-2005-48	PAN HEAD TAPTITE SCREW (PCB)	
7	2A		B11-1815-04	FILTER (LCD)		61	3B		R31-0652-15	VARIABLE RESISTOR (VOL)	
8	2A	*	B11-1816-12	ILLUMINATION GUIDE (LCD)		63	2B		S60-0430-05	ROTARY SWITCH (SELECTOR)	
9	3B		B11-1820-04	ILLUMINATION GUIDE (TX/BUSY)		65	1A	*	T07-0749-25	SPEAKER	
11	2A		B38-0900-35	LCD ASSY		67	3A		W09-0971-05	LITHIUM CELL	
12	2C		B62-2173-10	INSTRUCTION MANUAL		DISPLAY UNIT (X54-3472-72)					
13	3A	*	B72-2583-04	MODEL NAME-PLATE		D501,502			B30-2215-05	LED	
15	2B	*	E04-0416-25	RF COAXIAL RECEPTACLE (SMA)		D511-516			B30-2215-05	LED	
16	3B		E23-1104-04	TERMINAL (ANT)		D517-520			B30-2210-05	LED (TLY)	
17	3A		E29-1221-14	RELAY HARDWARE (VCO-CHASSIS)		C500-503			CK73HB1H471K	CHIP C 470PF	K
18	2A		E37-1101-05	SPEAKER WIRE (RED)		C508			CK73HB1H471K	CHIP C 470PF	K
19	2A		E37-1102-05	SPEAKER WIRE (BLACK)		C513			CK73GB1C104K	CHIP C 0.10UF	K
21	2A	*	E37-1107-15	FLAT CABLE		C518			CK73HB1H471K	CHIP C 470PF	K
22	3B		E58-0511-15	RECTANGULAR RECEPTACLE (SP/MIC)		C522			CK73HB1H102K	CHIP C 1000PF	K
23	3B		E72-0419-23	TERMINAL BLOCK		C523,524	*		CS77BA1C4R7M	CHIP TNTL 4.7UF	16WV
25	3A		F07-1880-04	COVER (OP BOARD)		C525			CK73HB1H471K	CHIP C 470PF	K
26	2A		F15-1012-04	SHADE (LCD FPC)		C527,528	*		CS77BP1C010M	CHIP TNTL 1.0UF	16WV
27	3B		F20-3350-04	INSULATING SHEET (TX-RX PCB)		C537,538			CK73GB0J475K	CHIP C 4.7UF	K
29	2A		G10-1340-04	FIBROUS SHEET (LONG)		C539,540			CK73HB1H102K	CHIP C 1000PF	K
30	2A		G10-1341-04	FIBROUS SHEET (SHORT)		C543-554			CK73HB1H102K	CHIP C 1000PF	K
31	2A	*	G11-4272-14	RUBBER CUSHION (SP)		C555			CK73HBOJ105K	CHIP C 1.0UF	K
32	3A	*	G11-4273-24	SHEET (PTT)		C556			CK73HB1H102K	CHIP C 1000PF	K
33	3A	*	G11-4308-14	RUBBER SHEET (FINAL FET)		C557			CK73HB1H471K	CHIP C 470PF	K
35	3A	*	G11-4332-04	SHEET (DISPLAY PCB)		C562			CK73HBOJ105K	CHIP C 1.0UF	K
36	2B		G13-1934-04	CUSHION (TX/BUSY LED)		C563,564			CK73HB1H102K	CHIP C 1000PF	K
37	2A		G13-2068-04	CUSHION (SP HOLDER)		C565			CK73HBOJ105K	CHIP C 1.0UF	K
38	3B		G53-1600-12	PACKING (TOP)		CN507			E40-6410-05	FLAT CABLE CONNECTOR	
39	3B		G53-1601-04	PACKING (TERMINAL BLOCK)		CN508	*		E40-6556-05	FLAT CABLE CONNECTOR	
41	3A	*	G53-1602-14	PACKING (OP BOARD COVER)		CN509	*		E40-6557-05	FLAT CABLE CONNECTOR	
42	2B,3B		G53-1603-04	PACKING (SMA/SELECTOR O-RING)		L550			L92-0163-05	BEADS CORE	
43	1A	*	G53-1686-11	PACKING (16KEY)		L553-556			L92-0163-05	BEADS CORE	
45	2C,1D	*	H12-3180-12	PACKING FIXTURE		CP501			RK75HA1J102J	CHIP-COM 1.0K	J 1/16W
47	2A		J19-5460-02	HOLDER (SP)		CP503,504			RK75HA1J102J	CHIP-COM 1.0K	J 1/16W
48	2B		J19-5478-03	HOLDER (VOL/SELECTOR)		CP506,507			RK75HA1J102J	CHIP-COM 1.0K	J 1/16W
49	2C	*	J29-0730-05	BELT CLIP ACCESSORY		CP509			RK75HA1J102J	CHIP-COM 1.0K	J 1/16W
50	3B		J30-1279-04	SPACER (VOL)		R500,501			RK73HB1J102J	CHIP R 1.0K	J 1/16W
51	3B		J82-0090-25	FPC (UNIVERSAL)		R517			RK73HB1J000J	CHIP R 0.0	J 1/16W
53	3A	*	J82-0091-25	FPC (PTT)		R518			RK73HB1J331J	CHIP R 330	J 1/16W
54	2B	*	J87-0024-05	FPC (VOL/SELECTOR)		R520			RK73HB1J472J	CHIP R 4.7K	J 1/16W
56	1A		K29-9302-33	KNOB (PTT)		R522			RK73HB1J391J	CHIP R 390	J 1/16W
57	1A		K29-9303-03	BUTTON KNOB (SIDE)		R524-526			RK73HB1J391J	CHIP R 390	J 1/16W
58	1B		K29-9304-03	KNOB (VOLUME)		R527			RK73HB1J000J	CHIP R 0.0	J 1/16W
59	1A		K29-9305-03	KNOB (CH SELECTOR)		R531			RK73HB1J000J	CHIP R 0.0	J 1/16W
A	2D	*	N08-0548-24	DRESSED SCREW ACCESSORY		R533			RK73HB1J000J	CHIP R 0.0	J 1/16W
B	3B		N09-2426-14	HEXAGON HEAD SCREW (BATT-)							
C	3A		N09-6565-05	PAN HEAD SCREW (CASE/CHASSIS)							
D	3B		N14-0806-04	CIRCULAR NUT (VOL)							

PARTS LIST

DISPLAY UNIT (X54-3472-72)

TX-RX UNIT (X57-6932-72)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R534			RK73HB1J101J	CHIP R 100 J 1/16W		C38			CK73GB1H102K	CHIP C 1000PF K	
R535			RK73HB1J000J	CHIP R 0.0 J 1/16W		C41			CC73GCH1H221J	CHIP C 220PF J	
R537			RK73HB1J101J	CHIP R 100 J 1/16W		C42			CC73HCH1H110G	CHIP C 11PF G	
R540-543			RK73HB1J471J	CHIP R 470 J 1/16W		C43			CK73HBOJ105K	CHIP C 1.0UF K	
R544			RK73HH1J184D	CHIP R 180K D 1/16W		C44,45			CC73HCH1H050B	CHIP C 5.0PF B	
R545			RK73HH1J474D	CHIP R 470K D 1/16W		C46			CC73HCH1H010B	CHIP C 1.0PF B	
R546			RK73HH1J273D	CHIP R 27K D 1/16W		C47			CK73HB1H102K	CHIP C 1000PF K	
R547			RK73HH1J223D	CHIP R 22K D 1/16W		C48			CC73HCH1H0R5B	CHIP C 0.5PF B	
R552			RK73HB1J471J	CHIP R 470 J 1/16W		C49			CC73HCH1H050B	CHIP C 5.0PF B	
R559			RK73HB1J000J	CHIP R 0.0 J 1/16W		C50			CC73GCH1H0R5B	CHIP C 0.5PF B	
R560			RK73HB1J474J	CHIP R 470K J 1/16W		C51			CC73HCH1H070B	CHIP C 7.0PF B	
R561			RK73HB1J103J	CHIP R 10K J 1/16W		C52			CC73HCH1H060B	CHIP C 6.0PF B	
R562-568			RK73HB1J102J	CHIP R 1.0K J 1/16W		C53			CC73GCH1H0R5B	CHIP C 0.5PF B	
R570			RK73GB2A000J	CHIP R 0.0 J 1/10W		C54			CC73HCH1H050B	CHIP C 5.0PF B	
R571			RK73HB1J000J	CHIP R 0.0 J 1/16W		C55			CC73HCH1H101J	CHIP C 100PF J	
R573			RK73HB1J474J	CHIP R 470K J 1/16W		C56			CK73HB1H102K	CHIP C 1000PF K	
R574			RK73HB1J000J	CHIP R 0.0 J 1/16W		C57			CC73HCH1H101J	CHIP C 100PF J	
R576-580			RK73HB1J331J	CHIP R 330 J 1/16W		C58,59			CK73HB1H102K	CHIP C 1000PF K	
R581			RK73HB1J000J	CHIP R 0.0 J 1/16W		C60			CS77AP1A100M	CHIP TNTL 10UF 10WV	
						C61			CK73HB1H102K	CHIP C 1000PF K	
MIC500	2A		T91-0579-05	MIC ELEMENT		C62			CC73HCH1H220J	CHIP C 22PF J	
D500			MA2S111-F	DIODE		C63			CC73HCH1H050C	CHIP C 5.0PF C	
D522			DA221	DIODE		C64			CC73HCH1H270J	CHIP C 27PF J	
IC500			BU2099FV	MOS-IC		C65-67			CK73HB1H102K	CHIP C 1000PF K	
IC501			XC6201P352MR	MOS-IC		C68			CC73HCH1H060B	CHIP C 6.0PF B	
IC502,503			HD74LV2G34AUS	MOS-IC		C70-73			CK73HB1H471K	CHIP C 470PF K	
Q501			2SC4617 (S)	TRANSISTOR		C77			CC73HCH1H101J	CHIP C 100PF J	
Q502			2SB1132 (Q,R)	TRANSISTOR		C81			CC73HCH1H030B	CHIP C 3.0PF B	
Q504			2SK1830F	FET		C100			CK73HB1H471K	CHIP C 470PF K	
Q505		*	2SJ144-Y (F)	FET		C101			CC73HCH1H220J	CHIP C 22PF J	
TX-RX UNIT (X57-6932-72)											
D400			B30-2278-05	LED (RED/YELLOW)		C105			CC73HCH1H150G	CHIP C 15PF G	
C1,2			CK73HB1H102K	CHIP C 1000PF K		C106			CK73HB1H102K	CHIP C 1000PF K	
C3			CC73HCH1H100C	CHIP C 10PF C		C107			CC73HCH1H221J	CHIP C 220PF J	
C4			CK73HB1C103K	CHIP C 0.010UF K		C109,110			CK73HB1H102K	CHIP C 1000PF K	
C5			CC73HCH1H100C	CHIP C 10PF C		C111			CK73HB1A104K	CHIP C 0.10UF K	
C6,7			CK73HB1H102K	CHIP C 1000PF K		C112			CC73HCH1H100C	CHIP C 10PF C	
C8			CK73HB1H471K	CHIP C 470PF K		C113			CC73HCH1H470J	CHIP C 47PF J	
C9-13			CK73HB1H102K	CHIP C 1000PF K		C114			CC73HCH1H080B	CHIP C 8.0PF B	
C14			CC73HCH1H220G	CHIP C 22PF G		C116			CK73HB1H102K	CHIP C 1000PF K	
C15			CC73GCH1H120G	CHIP C 12PF G		C117			CK73HB1A104K	CHIP C 0.10UF K	
C16,17			CC73HCH1H020B	CHIP C 2.0PF B		C119			CC73HCH1H100C	CHIP C 10PF C	
C18			CK73HB1H102K	CHIP C 1000PF K		C120			CC73HCH1H101J	CHIP C 100PF J	
C19			CK73HB1H471K	CHIP C 470PF K		C121			CK73GB1E105K	CHIP C 1.0UF K	
C20			CK73HB1C103K	CHIP C 0.010UF K		C122			CK73HB1H471K	CHIP C 470PF K	
C21			CK73HB1C223K	CHIP C 0.022UF K		C123			CS77BA1D6R8M	CHIP TNTL 6.8UF 20WV	
C22			CC73HCH1H180G	CHIP C 18PF G		C124			CK73HB1H102K	CHIP C 1000PF K	
C23			CC73GCH1H100C	CHIP C 10PF C		C125			CC73HCH1H100C	CHIP C 10PF C	
C24			CS77CA1V0R1M	CHIP TNTL 0.1UF 35WV		C126			CK73HB1H102K	CHIP C 1000PF K	
C25			CC73HCH1H030B	CHIP C 3.0PF B		C128			CK73HBOJ105K	CHIP C 1.0UF K	
C26		*	CS77AA1DR68M	CHIP TNTL 0.68UF 20WV		C131			CK73HB1H102K	CHIP C 1000PF K	
C27			CK73HB1H471K	CHIP C 470PF K		C132			CC73HCH1H101J	CHIP C 100PF J	
C28			CK73HB1H102K	CHIP C 1000PF K		C133			CK73HB1H471K	CHIP C 470PF K	
C29,30			CK73HB1H471K	CHIP C 470PF K		C135			CK73HB1H102K	CHIP C 1000PF K	
C32,33			CK73HB1A473K	CHIP C 0.047UF K		C136			CK73HB1C103K	CHIP C 0.010UF K	
						C138			CK73HB1H102K	CHIP C 1000PF K	
						C139			CK73GB1C104K	CHIP C 0.10UF K	
						C140			CK73GB1E105K	CHIP C 1.0UF K	
						C141,142			CC73GCH1H270G	CHIP C 27PF G	
						C143			CK73HB1C103K	CHIP C 0.010UF K	
						C144			CK73HB1H102K	CHIP C 1000PF K	

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TX-RX UNIT (X57-6932-72)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C146			CC73GCH1H040B	CHIP C 4.0PF B		C260			CC73GCH1H1R5B	CHIP C 1.5PF B	
C149			CC73GCH1H101J	CHIP C 100PF J		C261			CK73HB1H102K	CHIP C 1000PF K	
C150			CC73HCH1H101J	CHIP C 100PF J		C262			CC73HCH1H470J	CHIP C 47PF J	
C151			CC73GCH1H060B	CHIP C 6.0PF B		C263			CC73HCH1H020B	CHIP C 2.0PF B	
C152			CK73GB1H102K	CHIP C 1000PF K		C264			CS77CP1A4R7M	CHIP TNTL 4.7UF 10WV	
C153			CC73HCH1H080B	CHIP C 8.0PF B		C265			CK73HB1H102K	CHIP C 1000PF K	
C154			CC73HCH1H020B	CHIP C 2.0PF B		C269			CK73HB1H102K	CHIP C 1000PF K	
C155			CC73HCH1H180G	CHIP C 18PF G		C270			CK73HB1H471K	CHIP C 470PF K	
C156			CC73HCH1H040B	CHIP C 4.0PF B		C271			CK73HB0J105K	CHIP C 1.0UF K	
C158,159			CC73HCH1H080B	CHIP C 8.0PF B		C273			CK73HB1H471K	CHIP C 470PF K	
C163			CC73HCH1H100B	CHIP C 10PF B		C274			CK73HB1H102K	CHIP C 1000PF K	
C166			CC73HCH1H150G	CHIP C 15PF G		C275			CC73GCH1H100C	CHIP C 10PF C	
C168			CC73HCH1H220J	CHIP C 22PF J		C277			CC73HCH1H270J	CHIP C 27PF J	
C169			CC73GCH1H150G	CHIP C 15PF G		C279			CC73GCH1H010B	CHIP C 1.0PF B	
C195-198			CK73HB1A104K	CHIP C 0.10UF K		C280			CK73HB1H102K	CHIP C 1000PF K	
C200			CK73HB1A104K	CHIP C 0.10UF K		C281			CC73HCH1H270J	CHIP C 27PF J	
C201			CK73HB1C103K	CHIP C 0.010UF K		C282			CC73HCH1H020B	CHIP C 2.0PF B	
C202			CK73HB1C223K	CHIP C 0.022UF K		C284			CC73GCH1H100C	CHIP C 10PF C	
C203			CK73HB1H102K	CHIP C 1000PF K		C287			CC73HCH1H100B	CHIP C 10PF B	
C204			CK73HB1A104K	CHIP C 0.10UF K		C288,289			CC73HCH1H080B	CHIP C 8.0PF B	
C205			CK73HB1C103K	CHIP C 0.010UF K		C290			CK73HB0J224K	CHIP C 0.22UF K	
C206,207			CK73HB1A104K	CHIP C 0.10UF K		C292			CK73HB1C103K	CHIP C 0.010UF K	
C208			CK73HB1H182K	CHIP C 1800PF K		C400			CK73HB1H102K	CHIP C 1000PF K	
C209,210			CK73HB1A104K	CHIP C 0.10UF K		C401,402			CK73HB1H471K	CHIP C 470PF K	
C211,212			CC73HCH1H121J	CHIP C 120PF J		C403			CK73HB1C103K	CHIP C 0.010UF K	
C213			CC73HCH1H181J	CHIP C 180PF J		C404			CK73HB1H471K	CHIP C 470PF K	
C214		*	C92-0851-05	CHIP TNTL 15UF 10WV		C405			CC73HCH1H101J	CHIP C 100PF J	
C215,216			CK73HB1A104K	CHIP C 0.10UF K		C406-414			CK73HB1H471K	CHIP C 470PF K	
C217			CC73HCH1H680J	CHIP C 68PF J		C415			CK73FB1A475K	CHIP C 4.7UF K	
C219			CK73HB1A333K	CHIP C 0.033UF K		C416			CK73HB1H102K	CHIP C 1000PF K	
C220			CK73HB1C103K	CHIP C 0.010UF K		C417			CK73HB1H471K	CHIP C 470PF K	
C221			CS77AP1A100M	CHIP TNTL 10UF 10WV		C418			CK73HB1H102K	CHIP C 1000PF K	
C222			CK73HB1A104K	CHIP C 0.10UF K		C419			CK73GB1E105K	CHIP C 1.0UF K	
C226			CK73HB1H471K	CHIP C 470PF K		C420			CK73GB1C104K	CHIP C 0.10UF K	
C227,228			CK73HB1C103K	CHIP C 0.010UF K		C421			CK73GB1A224K	CHIP C 0.22UF K	
C229			CC73HCH1H1R5B	CHIP C 1.5PF B		C422			CK73GB1E105K	CHIP C 1.0UF K	
C230			CC73HCH1H270G	CHIP C 27PF G		C423			CS77AA1C100M	CHIP TNTL 10UF 16WV	
C231			CC73HCH1H060B	CHIP C 6.0PF B		C424			CK73HB1H471K	CHIP C 470PF K	
C232			CK73HB1C103K	CHIP C 0.010UF K		C425			CK73GB1E105K	CHIP C 1.0UF K	
C233			CK73HB1H471K	CHIP C 470PF K		C426			CC73HCH1H101J	CHIP C 100PF J	
C234			CK73HB1A104K	CHIP C 0.10UF K		C427			CK73GB1E105K	CHIP C 1.0UF K	
C235,236			CK73HB1C103K	CHIP C 0.010UF K		C428			CK73HB1H471K	CHIP C 470PF K	
C237			CK73HB1H102K	CHIP C 1000PF K		C429			CK73GB1E105K	CHIP C 1.0UF K	
C238			CC73HCH1H120J	CHIP C 12PF J		C431			CK73HB1H471K	CHIP C 470PF K	
C239			CC73HCH1H390J	CHIP C 39PF J		C432			CS77AA1C100M	CHIP TNTL 10UF 16WV	
C240			CC73HCH1H030B	CHIP C 3.0PF B		C433			CK73HB1H471K	CHIP C 470PF K	
C241			CC73HCH1H150J	CHIP C 15PF J		C434			CK73HB1H102K	CHIP C 1000PF K	
C242			CK73HB1H102K	CHIP C 1000PF K		C435			CK73GB1A224K	CHIP C 0.22UF K	
C243			CK73HB1C103K	CHIP C 0.010UF K		C436			CK73GB1H103K	CHIP C 0.010UF K	
C244			CC73HCH1H030B	CHIP C 3.0PF B		C437			CC73HCH1H101J	CHIP C 100PF J	
C245			CK73HB1H102K	CHIP C 1000PF K		C440			CK73HB1H471K	CHIP C 470PF K	
C246			CC73HCH1H080B	CHIP C 8.0PF B		C441			CK73GB1E105K	CHIP C 1.0UF K	
C247			CC73HCH1H030B	CHIP C 3.0PF B		C442			CK73GB1A224K	CHIP C 0.22UF K	
C248			CK73HB1H102K	CHIP C 1000PF K		C443			CK73GB1E105K	CHIP C 1.0UF K	
C250			CK73HB1H102K	CHIP C 1000PF K		C444			CK73HB1H471K	CHIP C 470PF K	
C253			CK73HB1H102K	CHIP C 1000PF K		C445			CC73HCH1H470J	CHIP C 47PF J	
C255			CC73GCH1H040B	CHIP C 4.0PF B		C446			CK73HB1H471K	CHIP C 470PF K	
C256			CC73HCH1H040B	CHIP C 4.0PF B		C447			CK73HB1E472K	CHIP C 4700PF K	
C257			CC73HCH1H470J	CHIP C 47PF J		C450,451			CK73GB0J475K	CHIP C 4.7UF K	
C258			CK73HB1H102K	CHIP C 1000PF K		C452		*	CK73GB1E104K	CHIP C 0.10UF K	

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C453			CK73HB1H471K	CHIP C 470PF K		C667			CC73HCH1H470J	CHIP C 47PF J	
C500			CS77AA1C100M	CHIP TNTL 10UF 16WV		C668			CC73HCH1H390J	CHIP C 39PF J	
C502			CS77AA1C100M	CHIP TNTL 10UF 16WV		C669			CK73HB1H102K	CHIP C 1000PF K	
C503			CK73GB1E105K	CHIP C 1.0UF K		C670			CK73HB1A104K	CHIP C 0.10UF K	
C505-508			CK73GB1E105K	CHIP C 1.0UF K		C672			CK73HB1H102K	CHIP C 1000PF K	
C509			CC73HCH1H270J	CHIP C 27PF J		C673-675			CK73HB1A104K	CHIP C 0.10UF K	
C510			CC73HCH1H040C	CHIP C 4.0PF C		C676			CC73HCH1H470J	CHIP C 47PF J	
C511			CC73HCH1H270J	CHIP C 27PF J		C677			CK73HB1H222K	CHIP C 2200PF K	
C512			CK73HB1C103K	CHIP C 0.010UF K		C678			CK73GB1C104K	CHIP C 0.10UF K	
C514			CK73HB1C103K	CHIP C 0.010UF K		C679,680			CK73HB1A104K	CHIP C 0.10UF K	
C515			CC73HCH1H150G	CHIP C 15PF G		C681			CK73HB1H102K	CHIP C 1000PF K	
C516			CK73HB1C103K	CHIP C 0.010UF K		C682			CK73HB1C153J	CHIP C 0.015UF J	
C517			CK73HB1A104K	CHIP C 0.10UF K		C683			CK73HB1C123J	CHIP C 0.012UF J	
C518			CK73HB0J105K	CHIP C 1.0UF K		C684			CK73HB1H102K	CHIP C 1000PF K	
C600			CK73HB1A104K	CHIP C 0.10UF K		C685			CK73HB1A104K	CHIP C 0.10UF K	
C601			CC73HCH1H220J	CHIP C 22PF J		C686			CK73HB1A683K	CHIP C 0.068UF K	
C602			CK73HB1A104K	CHIP C 0.10UF K		C687			CS77AP1A100M	CHIP TNTL 10UF 10WV	
C603			CK73HB1E472K	CHIP C 4700PF K		C688			CK73GB1E105K	CHIP C 1.0UF K	
C604,605			CC73HCH1H680J	CHIP C 68PF J		C689			CK73HB1C103K	CHIP C 0.010UF K	
C608			CK73HB1A104K	CHIP C 0.10UF K		C690			CC73HCH1H470J	CHIP C 47PF J	
C609,610			CK73HB1C103K	CHIP C 0.010UF K		C691			CK73GB1A474K	CHIP C 0.47UF K	
C611			CC73HCH1H101J	CHIP C 100PF J		C692			CC73HCH1H470J	CHIP C 47PF J	
C612,613			CK73HB1A104K	CHIP C 0.10UF K		C693			CK73GB1A474K	CHIP C 0.47UF K	
C614			CK73HB1H471K	CHIP C 470PF K		C694			CK73HB1H152K	CHIP C 1500PF K	
C615			CC73HCH1H101J	CHIP C 100PF J		C695			CK73HB1A104K	CHIP C 0.10UF K	
C616			CK73HB1H471K	CHIP C 470PF K		C696			CK73HB1C103K	CHIP C 0.010UF K	
C617			CS77AP1C2R2M	CHIP TNTL 2.2UF 16WV		C697			CK73HB1A104K	CHIP C 0.10UF K	
C618			CS77AP1A100M	CHIP TNTL 10UF 10WV		C698			CK73HB1A683K	CHIP C 0.068UF K	
C619			CK73HB1H561K	CHIP C 560PF K		C699			CS77CA1C100M	CHIP TNTL 10UF 16WV	
C620			CK73HB1A104K	CHIP C 0.10UF K		C700			CC73HCH1H470J	CHIP C 47PF J	
C621			CK73HB1C103K	CHIP C 0.010UF K		C702-704			CC73HCH1H470J	CHIP C 47PF J	
C625			CK73HB1A104K	CHIP C 0.10UF K		C705			CK73HB1A104K	CHIP C 0.10UF K	
C627			CK73HB1C103K	CHIP C 0.010UF K		C707-709			CK73HB1H102K	CHIP C 1000PF K	
C628			CK73HB1A104K	CHIP C 0.10UF K		C711-714			CK73HB1H102K	CHIP C 1000PF K	
C630			CK73HB1H271K	CHIP C 270PF K		C715-717			CK73HB1A104K	CHIP C 0.10UF K	
C631			CK73HB1A104K	CHIP C 0.10UF K		C718			CC73HCH1H180J	CHIP C 18PF J	
C632			CK73GB1E105K	CHIP C 1.0UF K		C719			CC73HCH1H220J	CHIP C 22PF J	
C633			CK73HB1C103K	CHIP C 0.010UF K		C720			CK73HB1H471K	CHIP C 470PF K	
C635			CC73HCH1H101J	CHIP C 100PF J		C721			CK73HB1H102K	CHIP C 1000PF K	
C636			CK73HB1A104K	CHIP C 0.10UF K		C725			CK73HB1H392K	CHIP C 3900PF K	
C638			CK73HB1H102K	CHIP C 1000PF K		C727			CK73HB1A104K	CHIP C 0.10UF K	
C640,641			CK73GB0J475K	CHIP C 4.7UF K		C728			CK73HB0J105K	CHIP C 1.0UF K	
C642			CK73HB1A563K	CHIP C 0.056UF K		C729			CK73HB1H331K	CHIP C 330PF K	
C644			CK73HB1C123J	CHIP C 0.012UF J		C730			CK73HB1H332K	CHIP C 3300PF K	
C645			CK73HB1A104K	CHIP C 0.10UF K		C732			CK73HB1H471K	CHIP C 470PF K	
C646			CK73GB0J225K	CHIP C 2.2UF K		C734			CC73HCH1H220J	CHIP C 22PF J	
C647			CK73HB1C123J	CHIP C 0.012UF J		C736			CC73HCH1H470J	CHIP C 47PF J	
C648			CK73HB1H102K	CHIP C 1000PF K		C737			CK73GB0J475K	CHIP C 4.7UF K	
C650,651			CK73HB1A104K	CHIP C 0.10UF K		C738			CK73HB1H221K	CHIP C 220PF K	
C652			CC73HCH1H680J	CHIP C 68PF J		C752,753			CC73HCH1H010B	CHIP C 1.0PF B	
C653-655			CK73HB1A104K	CHIP C 0.10UF K		C754			CK73HB1A104K	CHIP C 0.10UF K	
C656			CK73HB0J224K	CHIP C 0.22UF K		C755			CK73HB1E472K	CHIP C 4700PF K	
C657			CC73HCH1H330J	CHIP C 33PF J		C756			CK73HB1A104K	CHIP C 0.10UF K	
C658			CK73HB1A104K	CHIP C 0.10UF K		C757			CK73HB1E472K	CHIP C 4700PF K	
C659,660			CK73GB1C104K	CHIP C 0.10UF K		C759			CK73HB1C123J	CHIP C 0.012UF J	
C661			CK73HB1A104K	CHIP C 0.10UF K		C762			CK73HB1H102K	CHIP C 1000PF K	
C662			CK73HB1H102K	CHIP C 1000PF K		C765			CC73HCH1H270G	CHIP C 27PF G	
C663			CK73HB0J105K	CHIP C 1.0UF K		C766,767			CK73HB1H102K	CHIP C 1000PF K	
C665			CK73GB1E223K	CHIP C 0.022UF K		C770			CK73HB1H102K	CHIP C 1000PF K	
C666			CK73HB1A104K	CHIP C 0.10UF K		C771			CC73HCH1H270G	CHIP C 27PF G	

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Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C773,774			CK73HB1A333K	CHIP C 0.033UF K		L203			L92-0138-05	CHIP FERRITE	
C775			CK73HB1A104K	CHIP C 0.10UF K		L204		*	L41-2785-39	SMALL FIXED INDUCTOR (0.27UH)	
C776,777			CC73HCH1H820J	CHIP C 82PF J		L206,207			L40-2275-92	SMALL FIXED INDUCTOR (22NH)	
C950,951			CK73HB1C103K	CHIP C 0.010UF K		L208			L40-5675-92	SMALL FIXED INDUCTOR (56NH)	
						L209			L40-1085-92	SMALL FIXED INDUCTOR (100NH)	
TC1,2			C05-0384-05	CERAMIC TRIMMER CAPACITOR (10PF)		L211			L41-2778-14	SMALL FIXED INDUCTOR (27NH)	
CN400			E40-6452-05	FLAT CABLE CONNECTOR		L213			L92-0138-05	CHIP FERRITE	
CN500			E40-6557-05	FLAT CABLE CONNECTOR		L214			L41-2778-14	SMALL FIXED INDUCTOR (27NH)	
CN502,503			E23-1293-05	TEST TERMINAL		L215			L41-3378-14	SMALL FIXED INDUCTOR (33NH)	
CN600			E40-6389-05	PIN ASSY		L216			L41-2778-14	SMALL FIXED INDUCTOR (27NH)	
CN602			E40-6453-05	FLAT CABLE CONNECTOR		L218			L40-3975-92	SMALL FIXED INDUCTOR (39NH)	
CN603			E23-1263-05	TERMINAL		L220		*	L41-5685-39	SMALL FIXED INDUCTOR (0.56UH)	
CN604			E23-1262-05	TERMINAL		L400			L92-0149-05	CHIP FERRITE	
F400			F53-0324-05	FUSE (2.5A)		L500-503			L92-0163-05	BEADS CORE	
F601,602			F53-0315-05	FUSE (250MA)		L504			L92-0419-15	CHIP FERRITE	
CN501			J19-5386-05	HOLDER (LITHIUM CELL)		L600			L92-0163-05	BEADS CORE	
CD200			L79-1834-05	TUNING COIL		L601			L92-0419-15	CHIP FERRITE	
CF200			L72-1013-05	CERAMIC FILTER		L602-607			L92-0163-05	BEADS CORE	
CF201			L72-1014-05	CERAMIC FILTER		L608,609			L92-0467-05	CHIP FERRITE	
						L610,611			L92-0408-05	CHIP FERRITE	
L1		*	L41-4795-39	SMALL FIXED INDUCTOR (4.7UH)		L612			L92-0163-05	BEADS CORE	
L2		*	L40-3963-92	SMALL FIXED INDUCTOR (3.9NH)		L613			L92-0419-15	CHIP FERRITE	
L3		*	L40-4763-57	SMALL FIXED INDUCTOR (4.7NH)		L615			L92-0163-05	BEADS CORE	
L4			L40-4775-92	SMALL FIXED INDUCTOR (47NH)		X1			L77-1952-05	TCXO (16.8MHZ)	
L5			L40-3375-92	SMALL FIXED INDUCTOR (33NH)		X200			L77-1957-05	CRYSTAL RESONATOR (59.395MHZ)	
L6			L40-3963-92	SMALL FIXED INDUCTOR (3.9NH)		X500			L77-1958-05	CRYSTAL RESONATOR (11.0592MHZ)	
L7		*	L40-4763-57	SMALL FIXED INDUCTOR (4.7NH)		X501			L77-1802-05	CRYSTAL RESONATOR (32768HZ)	
L8			L92-0138-05	CHIP FERRITE		X600		*	L77-1976-05	CRYSTAL RESONATOR (3.6864MHZ)	
L10,11			L40-2785-92	SMALL FIXED INDUCTOR (270NH)		XF200			L71-0622-05	MCF (59.85MHZ)	
L12			L92-0163-05	BEADS CORE		CP400,401			RK75HA1J473J	CHIP-COM 47K J 1/16W	
L13,14			L40-2785-92	SMALL FIXED INDUCTOR (270NH)		CP500-510			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L16			L40-2785-92	SMALL FIXED INDUCTOR (270NH)		CP511			RK75HA1J331J	CHIP-COM 330 J 1/16W	
L17			L40-6878-67	SMALL FIXED INDUCTOR (68NH)		CP512-515			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L18			L40-3978-67	SMALL FIXED INDUCTOR (39NH)		CP516			RK75HA1J103J	CHIP-COM 10K J 1/16W	
L20		*	L40-1095-67	SMALL FIXED INDUCTOR (1UH)		CP517			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L21			L92-0163-05	BEADS CORE		CP518			RK75HA1J473J	CHIP-COM 47K J 1/16W	
L22			L40-6875-92	SMALL FIXED INDUCTOR (68NH)		CP519			RK75HA1J103J	CHIP-COM 10K J 1/16W	
L23			L40-5675-92	SMALL FIXED INDUCTOR (56NH)		CP521			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L24			L40-2275-92	SMALL FIXED INDUCTOR (22NH)		CP522			RK75HA1J101J	CHIP-COM 100 J 1/16W	
L29			L40-2785-92	SMALL FIXED INDUCTOR (270NH)		CP600			RK75HA1J473J	CHIP-COM 47K J 1/16W	
L30		*	L40-1095-67	SMALL FIXED INDUCTOR (1UH)		CP601-603			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L100,101			L40-3975-92	SMALL FIXED INDUCTOR (39NH)		CP604,605			RK75HA1J331J	CHIP-COM 330 J 1/16W	
L102			L92-0138-05	CHIP FERRITE		CP606			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L104			L41-2275-43	SMALL FIXED INDUCTOR (22NH)		CP607,608			RK75HA1J101J	CHIP-COM 100 J 1/16W	
L105			L92-0149-05	CHIP FERRITE		R2			RK73HB1J101J	CHIP R 100 J 1/16W	
L106			L41-1575-43	SMALL FIXED INDUCTOR (15NH)		R3			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L107		*	L34-4916-05	AIR-CORE COIL		R4			RK73HB1J100J	CHIP R 10 J 1/16W	
L108			L92-0149-05	CHIP FERRITE		R5			RK73HB1J103J	CHIP R 10K J 1/16W	
L109		*	L41-2295-39	SMALL FIXED INDUCTOR (2.2UH)		R6			RK73HB1J223J	CHIP R 22K J 1/16W	
L110			L34-4576-05	AIR-CORE COIL		R7			RK73HB1J472J	CHIP R 4.7K J 1/16W	
L111			L34-4567-05	AIR-CORE COIL		R8-10			RK73HB1J100J	CHIP R 10 J 1/16W	
L112			L34-4566-05	AIR-CORE COIL		R11			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L113			L34-4564-05	AIR-CORE COIL		R12			RK73HB1J272J	CHIP R 2.7K J 1/16W	
L115			L34-4573-05	AIR-CORE COIL		R13			RK73HB1J154J	CHIP R 150K J 1/16W	
L116			L34-4572-05	AIR-CORE COIL		R14,15			RK73HB1J100J	CHIP R 10 J 1/16W	
L117			L34-4564-05	AIR-CORE COIL		R16,17			RK73HB1J223J	CHIP R 22K J 1/16W	
L200			L92-0470-05	CHIP FERRITE		R18			RK73HB1J472J	CHIP R 4.7K J 1/16W	
L201			L40-1091-86	SMALL FIXED INDUCTOR (1.0UH)		R19			RK73HB1J122J	CHIP R 1.2K J 1/16W	
L202			L40-1591-86	SMALL FIXED INDUCTOR (1.5UH)		R20			RK73HB1J331J	CHIP R 330 J 1/16W	

PARTS LIST

TX-RX UNIT (X57-6932-72)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R21			RK73HB1J122J	CHIP R 1.2K J 1/16W		R160			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R22			RK73HB1J560J	CHIP R 56 J 1/16W		R200			RK73HB1J824J	CHIP R 820K J 1/16W	
R23			RK73HB1J223J	CHIP R 22K J 1/16W		R202			RK73HB1J224J	CHIP R 220K J 1/16W	
R24			RK73HB1J103J	CHIP R 10K J 1/16W		R203			RK73HB1J334J	CHIP R 330K J 1/16W	
R25			RK73HB1J563J	CHIP R 56K J 1/16W		R204			RK73HB1J104J	CHIP R 100K J 1/16W	
R26			RK73HB1J683J	CHIP R 68K J 1/16W		R205			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R31			RK73HB1J105J	CHIP R 1.0M J 1/16W		R206			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R33,34			RK73HB1J271J	CHIP R 270 J 1/16W		R207			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R37			RK73HB1J100J	CHIP R 10 J 1/16W		R208,209			RK73HB1J223J	CHIP R 22K J 1/16W	
R39			RK73HB1J100J	CHIP R 10 J 1/16W		R210			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R40			RK73HB1J154J	CHIP R 150K J 1/16W		R211,212			RK73HB1J223J	CHIP R 22K J 1/16W	
R41			RK73HB1J472J	CHIP R 4.7K J 1/16W		R213			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R42			RK73HB1J474J	CHIP R 470K J 1/16W		R214			RK73HB1J334J	CHIP R 330K J 1/16W	
R43			RK73HB1J101J	CHIP R 100 J 1/16W		R215			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R44			RK73HB1J472J	CHIP R 4.7K J 1/16W		R216			RK73HB1J153J	CHIP R 15K J 1/16W	
R45			RK73HB1J332J	CHIP R 3.3K J 1/16W		R217			RK73HB1J184J	CHIP R 180K J 1/16W	
R46			RK73HB1J103J	CHIP R 10K J 1/16W		R218			RK73HB1J273J	CHIP R 27K J 1/16W	
R47			RK73HB1J271J	CHIP R 270 J 1/16W		R219			RK73GB2A184J	CHIP R 180K J 1/10W	
R48			RK73HB1J222J	CHIP R 2.2K J 1/16W		R220			RK73HB1J184J	CHIP R 180K J 1/16W	
R49			RK73HB1J470J	CHIP R 47 J 1/16W		R221			RK73GB2A332J	CHIP R 3.3K J 1/10W	
R50			RK73GB2A472J	CHIP R 4.7K J 1/10W		R222			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R51			RK73HB1J000J	CHIP R 0.0 J 1/16W		R223			RK73HB1J474J	CHIP R 470K J 1/16W	
R53			RK73HB1J000J	CHIP R 0.0 J 1/16W		R224			RK73HB1J392J	CHIP R 3.9K J 1/16W	
R100			RK73HB1J223D	CHIP R 22K D 1/16W		R225			RK73HB1J100J	CHIP R 10 J 1/16W	
R101			RK73HB1J472J	CHIP R 4.7K J 1/16W		R226			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R103,104			RK73HB1J000J	CHIP R 0.0 J 1/16W		R227			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R106			RK73HB1J180J	CHIP R 18 J 1/16W		R228			RK73HB1J221J	CHIP R 220 J 1/16W	
R111			RK73HB1J470J	CHIP R 47 J 1/16W		R230			RK73HB1J564J	CHIP R 560K J 1/16W	
R112			RK73HB1J153J	CHIP R 15K J 1/16W		R231			RK73HB1J181J	CHIP R 180 J 1/16W	
R113			RK73HB1J223J	CHIP R 22K J 1/16W		R232			RK73HB1J221J	CHIP R 220 J 1/16W	
R115			RK73HB1J221J	CHIP R 220 J 1/16W		R233			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R116			RK73HB1J103J	CHIP R 10K J 1/16W		R234			RK73HB1J470J	CHIP R 47 J 1/16W	
R117			RK73HB1J683J	CHIP R 68K J 1/16W		R235			RK73HB1J100J	CHIP R 10 J 1/16W	
R119			RK73HB1J470J	CHIP R 47 J 1/16W		R236			RK73HB1J681J	CHIP R 680 J 1/16W	
R120			RK73HB1J331J	CHIP R 330 J 1/16W		R237			RK73HB1J560J	CHIP R 56 J 1/16W	
R121			RK73HB1J221J	CHIP R 220 J 1/16W		R239-242			RK73HB1J823J	CHIP R 82K J 1/16W	
R122			RK73HB1J271J	CHIP R 270 J 1/16W		R243			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R123			RK73HB1J000J	CHIP R 0.0 J 1/16W		R245,246			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R125			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R248			RK73HB1J680J	CHIP R 68 J 1/16W	
R126			RK73HB1J470J	CHIP R 47 J 1/16W		R249			RK73HB1J221J	CHIP R 220 J 1/16W	
R127			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R251			RK73HB1J104J	CHIP R 100K J 1/16W	
R128			RK73HB1J104D	CHIP R 100K D 1/16W		R252			RK73HB1J274J	CHIP R 270K J 1/16W	
R130			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R253			RK73HB1J184J	CHIP R 180K J 1/16W	
R132,133			RK73HB1J154D	CHIP R 150K D 1/16W		R254			RK73HB1J224J	CHIP R 220K J 1/16W	
R134			RK73HB1J000J	CHIP R 0.0 J 1/16W		R255			RK73HB1J104J	CHIP R 100K J 1/16W	
R135			RK73HB1J123J	CHIP R 12K J 1/16W		R256,257			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R137-140			RK73HB1J154D	CHIP R 150K D 1/16W		R262-265			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R141			RK73HB1J103J	CHIP R 10K J 1/16W		R266			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R142			RK73HB1J473J	CHIP R 47K J 1/16W		R400			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R143			RK73HB1J000J	CHIP R 0.0 J 1/16W		R402			RK73HB1J821J	CHIP R 820 J 1/16W	
R144			RK73HB1J105J	CHIP R 1.0M J 1/16W		R403			RK73HB1J561J	CHIP R 560 J 1/16W	
R145			RK73HB1J392J	CHIP R 3.9K J 1/16W		R404			RK73HB1J103J	CHIP R 10K J 1/16W	
R146			RK73HB1J184J	CHIP R 180K J 1/16W		R405			RK73HB1J104J	CHIP R 100K J 1/16W	
R147			RK73HB1J104J	CHIP R 100K J 1/16W		R406			RK73HB1J224J	CHIP R 220K J 1/16W	
R148,149			RK73HB1J271J	CHIP R 270 J 1/16W		R407			RK73HB1J684J	CHIP R 680K J 1/16W	
R150			RK73GB2A000J	CHIP R 0.0 J 1/10W		R408,409			RK73HB1J474J	CHIP R 470K J 1/16W	
R152			RK73HB1J000J	CHIP R 0.0 J 1/16W		R410			RK73HB1J103J	CHIP R 10K J 1/16W	
R153			RK73HB1J393J	CHIP R 39K J 1/16W		R411,412			RK73HB1J474D	CHIP R 470K D 1/16W	
R154			RK73HB1J331J	CHIP R 330 J 1/16W		R414			RK73HB1J103J	CHIP R 10K J 1/16W	
R155			RK73EB2E823J	CHIP R 82K J 1/4W		R415			RK73HB1J153J	CHIP R 15K J 1/16W	

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R416			RK73HB1J000J	CHIP R 0.0 J 1/16W		R642			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R417			RK73HB1J684J	CHIP R 680K J 1/16W		R643			RK73HB1J104J	CHIP R 100K J 1/16W	
R418			RK73HB1J474J	CHIP R 470K J 1/16W		R644			RK73HB1J103J	CHIP R 10K J 1/16W	
R419			RK73HB1J105J	CHIP R 1.0M J 1/16W		R645			RK73HB1J104J	CHIP R 100K J 1/16W	
R421			RK73HB1J102J	CHIP R 1.0K J 1/16W		R648			RK73HB1J104J	CHIP R 100K J 1/16W	
R422			RK73HB1J472J	CHIP R 4.7K J 1/16W		R650			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R423,424			RK73HB1J103J	CHIP R 10K J 1/16W		R652			RK73HB1J103J	CHIP R 10K J 1/16W	
R425-427			RK73HB1J473J	CHIP R 47K J 1/16W		R654			RK73HB1J683J	CHIP R 68K J 1/16W	
R428			RK73HB1J124J	CHIP R 120K J 1/16W		R655			RK73HB1J682J	CHIP R 6.8K J 1/16W	
R430			RK73HB1J103J	CHIP R 10K J 1/16W		R656			RK73HB1J563J	CHIP R 56K J 1/16W	
R500			RK73HB1J000J	CHIP R 0.0 J 1/16W		R657			RK73HB1J564J	CHIP R 560K J 1/16W	
R504			RK73HB1J000J	CHIP R 0.0 J 1/16W		R658			RK73HB1J473J	CHIP R 47K J 1/16W	
R505			RK73HB1J473J	CHIP R 47K J 1/16W		R659			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R506			RK73HB1J000J	CHIP R 0.0 J 1/16W		R660			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R507			RK73HB1J474J	CHIP R 470K J 1/16W		R661			RK73HH1J394D	CHIP R 390K D 1/16W	
R508-510			RK73HB1J473J	CHIP R 47K J 1/16W		R663			RK73HB1J103J	CHIP R 10K J 1/16W	
R511			RK73HB1J000J	CHIP R 0.0 J 1/16W		R664			RK73HB1J124J	CHIP R 120K J 1/16W	
R512			RK73HB1J473J	CHIP R 47K J 1/16W		R666			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R513			RK73HB1J102J	CHIP R 1.0K J 1/16W		R667			RK73HB1J394J	CHIP R 390K J 1/16W	
R514			RK73HB1J472J	CHIP R 4.7K J 1/16W		R668			RK73HB1J154J	CHIP R 150K J 1/16W	
R515			RK73HB1J473J	CHIP R 47K J 1/16W		R669			RK73HB1J124J	CHIP R 120K J 1/16W	
R516,517			RK73HB1J102J	CHIP R 1.0K J 1/16W		R670			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R518			RK73HB1J153J	CHIP R 15K J 1/16W		R671			RK73HB1J104J	CHIP R 100K J 1/16W	
R519			RK73HB1J474J	CHIP R 470K J 1/16W		R672			RK73HB1J224J	CHIP R 220K J 1/16W	
R520			RK73HB1J103J	CHIP R 10K J 1/16W		R673,674			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R521			RK73HH1J272D	CHIP R 2.7K D 1/16W		R675			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R522			RK73HH1J512D	CHIP R 5.1K D 1/16W		R676			RK73HB1J274J	CHIP R 270K J 1/16W	
R523			RK73HB1J000J	CHIP R 0.0 J 1/16W		R677			RK73HB1J223J	CHIP R 22K J 1/16W	
R524			RK73HB1J473J	CHIP R 47K J 1/16W		R679			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R525			RK73HB1J102J	CHIP R 1.0K J 1/16W		R680			RK73HB1J274J	CHIP R 270K J 1/16W	
R526			RK73GB2A000J	CHIP R 0.0 J 1/10W		R681			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R527			RK73HB1J473J	CHIP R 47K J 1/16W		R682			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R528			RK73HB1J474J	CHIP R 470K J 1/16W		R683			RK73HB1J154J	CHIP R 150K J 1/16W	
R600			RK73HB1J684J	CHIP R 680K J 1/16W		R684			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R601			RK73HB1J394J	CHIP R 390K J 1/16W		R685			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R603			RK73HB1J000J	CHIP R 0.0 J 1/16W		R686			RK73HH1J474D	CHIP R 470K D 1/16W	
R604			RK73HB1J184J	CHIP R 180K J 1/16W		R687			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R605			RK73HB1J393J	CHIP R 39K J 1/16W		R688			RK73HB1J273J	CHIP R 27K J 1/16W	
R606			RK73HB1J184J	CHIP R 180K J 1/16W		R689			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R607			RK73HB1J223J	CHIP R 22K J 1/16W		R691			RK73HB1J103J	CHIP R 10K J 1/16W	
R609			RK73HB1J104J	CHIP R 100K J 1/16W		R692			RK73HB1J823J	CHIP R 82K J 1/16W	
R612			RK73HB1J103J	CHIP R 10K J 1/16W		R693			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R613			RK73HB1J104J	CHIP R 100K J 1/16W		R694			RK73HH1J104D	CHIP R 100K D 1/16W	
R614			RK73HB1J683J	CHIP R 68K J 1/16W		R695			RK73HB1J103J	CHIP R 10K J 1/16W	
R615			RK73HB1J000J	CHIP R 0.0 J 1/16W		R696			RK73HB1J184J	CHIP R 180K J 1/16W	
R616			RK73HB1J104J	CHIP R 100K J 1/16W		R697			RK73HB1J474J	CHIP R 470K J 1/16W	
R617			RK73HB1J683J	CHIP R 68K J 1/16W		R698			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R618			RK73HB1J000J	CHIP R 0.0 J 1/16W		R699			RK73HB1J334J	CHIP R 330K J 1/16W	
R619			RK73HB1J394J	CHIP R 390K J 1/16W		R700			RK73HB1J184J	CHIP R 180K J 1/16W	
R623			RK73HB1J104J	CHIP R 100K J 1/16W		R701			RK73HB1J223J	CHIP R 22K J 1/16W	
R624			RK73HB1J000J	CHIP R 0.0 J 1/16W		R702,703			RK73HB1J473J	CHIP R 47K J 1/16W	
R625			RK73HB1J472J	CHIP R 4.7K J 1/16W		R704			RK73HB1J471J	CHIP R 470 J 1/16W	
R626			RK73HB1J184J	CHIP R 180K J 1/16W		R705,706			RK73HB1J153J	CHIP R 15K J 1/16W	
R627			RK73HB1J684J	CHIP R 680K J 1/16W		R707			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R628,629			RK73HB1J000J	CHIP R 0.0 J 1/16W		R708			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R631			RK73HB1J474J	CHIP R 470K J 1/16W		R709			RK73HB1J104J	CHIP R 100K J 1/16W	
R635,636			RK73HB1J472J	CHIP R 4.7K J 1/16W		R710			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R637			RK73HB1J332J	CHIP R 3.3K J 1/16W		R711			RK73HB1J473J	CHIP R 47K J 1/16W	
R638			RK73HB1J103J	CHIP R 10K J 1/16W		R712			RK73HB1J104J	CHIP R 100K J 1/16W	
R641			RK73HB1J273J	CHIP R 27K J 1/16W		R713			RK73HB1J102J	CHIP R 1.0K J 1/16W	

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TX-RX UNIT (X57-6932-72)

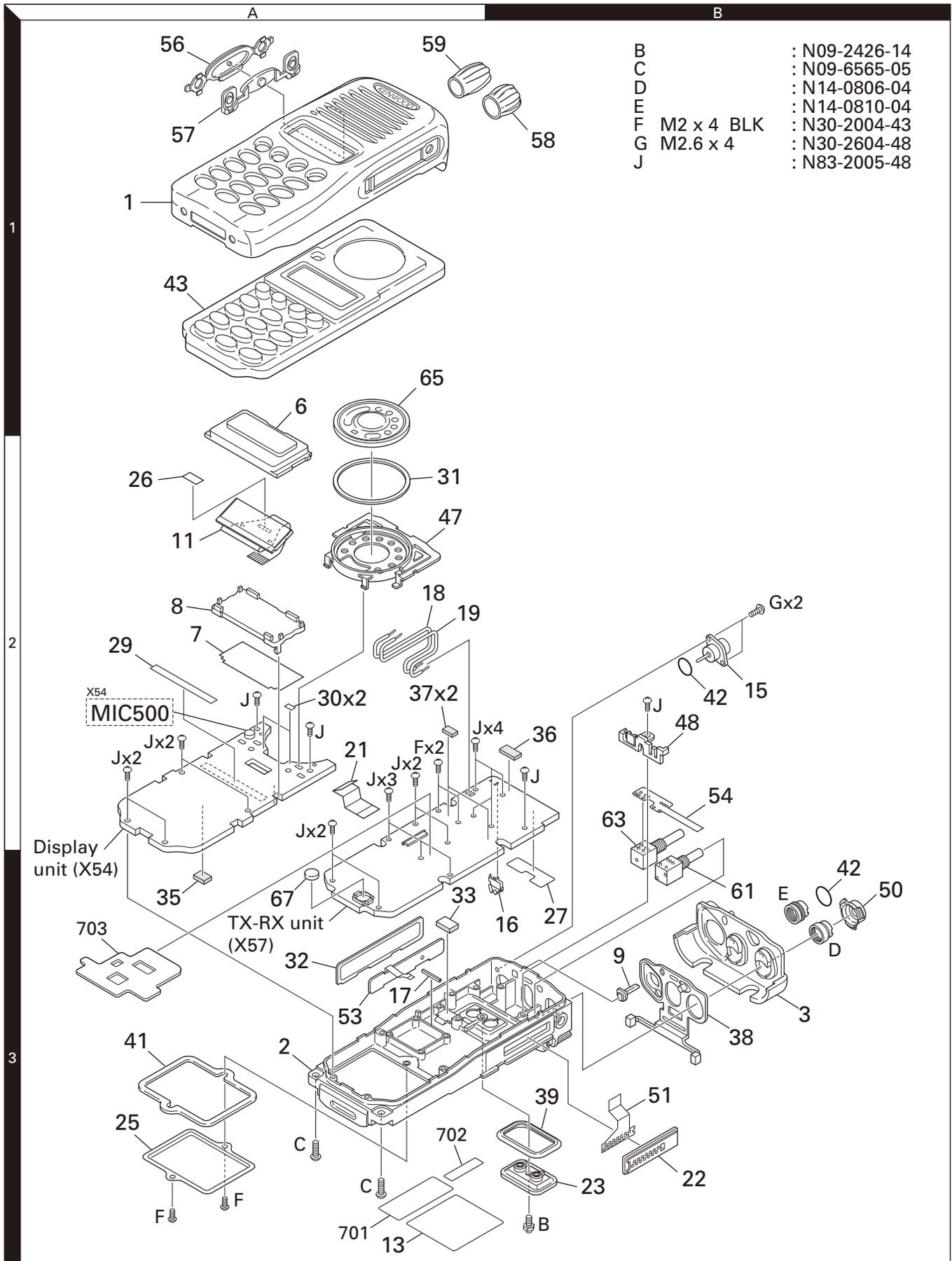
Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R714			RK73HB1J104J	CHIP R 100K J 1/16W		R815			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R715			RK73HB1J272J	CHIP R 2.7K J 1/16W		R816			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R716			RK73HB1J104J	CHIP R 100K J 1/16W		R817			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R717-720			RK73HB1J101J	CHIP R 100 J 1/16W							
R721			RK73HB1J103J	CHIP R 10K J 1/16W		S400			S70-0483-05	TACT SWITCH	
R722			RK73HB1J474J	CHIP R 470K J 1/16W		D1-4			HVC131	DIODE	
R723			RK73HB1J470J	CHIP R 47 J 1/16W		D7			1SV325F	VARIABLE CAPACITANCE DIODE	
R724			RK73HB1J102J	CHIP R 1.0K J 1/16W		D9			1SV325F	VARIABLE CAPACITANCE DIODE	
R725,726			RK73HB1J331J	CHIP R 330 J 1/16W		D11			1SV325F	VARIABLE CAPACITANCE DIODE	
R728-734			RK73HB1J102J	CHIP R 1.0K J 1/16W		D13			1SV325F	VARIABLE CAPACITANCE DIODE	
R735			RK73HB1J473J	CHIP R 47K J 1/16W		D17			1SV278F	VARIABLE CAPACITANCE DIODE	
R736,737			RK73HB1J472J	CHIP R 4.7K J 1/16W		D18			MA2S111-F	DIODE	
R738			RK73HB1J124J	CHIP R 120K J 1/16W		D100			HSC277	DIODE	
R739			RK73HB1J184J	CHIP R 180K J 1/16W		D103			HZU4ALL	ZENER DIODE	
R740,741			RK73HB1J123J	CHIP R 12K J 1/16W		D106,107			HVC131	DIODE	
R742			RK73HB1J822J	CHIP R 8.2K J 1/16W		D108			HZU2ALL	ZENER DIODE	
R744			RK73HB1J472J	CHIP R 4.7K J 1/16W		D200			MA2S111-F	DIODE	
R745			RK73HB1J823J	CHIP R 82K J 1/16W		D201			KDS121E-P	DIODE	
R747			RK73HB1J000J	CHIP R 0.0 J 1/16W		D202			RB706F-40	DIODE	
R748			RK73HB1J472J	CHIP R 4.7K J 1/16W		D203			KDS121E-P	DIODE	
R750			RK73HB1J823J	CHIP R 82K J 1/16W		D204			MA2S111-F	DIODE	
R752			RK73HB1J000J	CHIP R 0.0 J 1/16W		D205			HSC277	DIODE	
R753			RK73HB1J103J	CHIP R 10K J 1/16W		D207-210			1SV305F	VARIABLE CAPACITANCE DIODE	
R754			RK73HB1J472J	CHIP R 4.7K J 1/16W		D211			HVC131	DIODE	
R755			RK73GB2A000J	CHIP R 0.0 J 1/10W		D213			HVC131	DIODE	
R758			RK73HB1J473J	CHIP R 47K J 1/16W		D314			MA2S111-F	DIODE	
R760			RK73HB1J104J	CHIP R 100K J 1/16W		D402			GN1G	DIODE	
R761			RK73HB1J222J	CHIP R 2.2K J 1/16W		D403			1SS301F	DIODE	
R762			RK73HB1J472J	CHIP R 4.7K J 1/16W		D404			MA2S111-F	DIODE	
R764,765			RK73GB2A000J	CHIP R 0.0 J 1/10W		D405			RB521S-30	DIODE	
R766			RK73HB1J222J	CHIP R 2.2K J 1/16W		D406			MA2S111-F	DIODE	
R767			RK73HB1J474J	CHIP R 470K J 1/16W		D408			MA2S111-F	DIODE	
R768			RK73HB1J101J	CHIP R 100 J 1/16W		D500			MA2S111-F	DIODE	
R769-771			RK73HB1J102J	CHIP R 1.0K J 1/16W		D501,502			1SS388F	DIODE	
R772			RK73HB1J000J	CHIP R 0.0 J 1/16W		D600-603			RB706F-40	DIODE	
R773			RK73HB1J823J	CHIP R 82K J 1/16W		D604			015AZ6.8F	ZENER DIODE	
R775			RK73HB1J563J	CHIP R 56K J 1/16W		D605			1SS373F	DIODE	
R776			RK73HB1J473J	CHIP R 47K J 1/16W		D606			015AZ6.8F	ZENER DIODE	
R777			RK73HB1J100J	CHIP R 10 J 1/16W		D607			015AZ2.4 (X)F	ZENER DIODE	
R780			RK73HB1J103J	CHIP R 10K J 1/16W		D608			015AZ6.8F	ZENER DIODE	
R781			RK73HB1J102J	CHIP R 1.0K J 1/16W		D609,610			DA221	DIODE	
R782			RK73HB1J000J	CHIP R 0.0 J 1/16W		D611	*		NNCD6.8G-A	ZENER DIODE	
R783			RK73HB1J563J	CHIP R 56K J 1/16W		D612			015AZ6.8F	ZENER DIODE	
R784			RK73HB1J473J	CHIP R 47K J 1/16W		D613			DA221	DIODE	
R785			RK73HH1J123D	CHIP R 12K D 1/16W		D614			KDS121E-P	DIODE	
R786			RK73HH1J562D	CHIP R 5.6K D 1/16W		IC1			ADF4111BCP7	MOS-IC	
R787			RK73HH1J822D	CHIP R 8.2K D 1/16W		IC100			TA75W01FUF	MOS-IC	
R788			RK73HB1J473J	CHIP R 47K J 1/16W		IC200			TA31136FNG	MOS-IC	
R790			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC400			XC61CC5602NR	MOS-IC	
R792			RK73HB1J223J	CHIP R 22K J 1/16W		IC401			TK11250CUCB	MOS-IC	
R794			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC402,403			XC6204B502MR	MOS-IC	
R796			RK73GB2A000J	CHIP R 0.0 J 1/10W		IC404			TC75S51FE (F)	MOS-IC	
R800			RK73GB2A000J	CHIP R 0.0 J 1/10W		IC405			S-80942CNNB-G	MOS-IC	
R801-804			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC406			TK11250CUCB	MOS-IC	
R805			RK73HB1J473J	CHIP R 47K J 1/16W		IC500	*		AT29C040A-90TU	ROM IC	
R806			RK73HB1J474J	CHIP R 470K J 1/16W		IC502			30625MGP169GU	MICROPROCESSOR IC	
R807,808			RK73HB1J473J	CHIP R 47K J 1/16W		IC503			RV5C386A	MOS-IC	
R809			RK73HB1J474J	CHIP R 470K J 1/16W		IC504			CAT24C256WIGC	ROM IC	
R810			RK73HB1J473J	CHIP R 47K J 1/16W		IC505			TC7W53FK (F)	MOS-IC	
R811-813			RK73HB1J000J	CHIP R 0.0 J 1/16W		IC600-604			TC75W51FK (F)	MOS-IC	

PARTS LIST

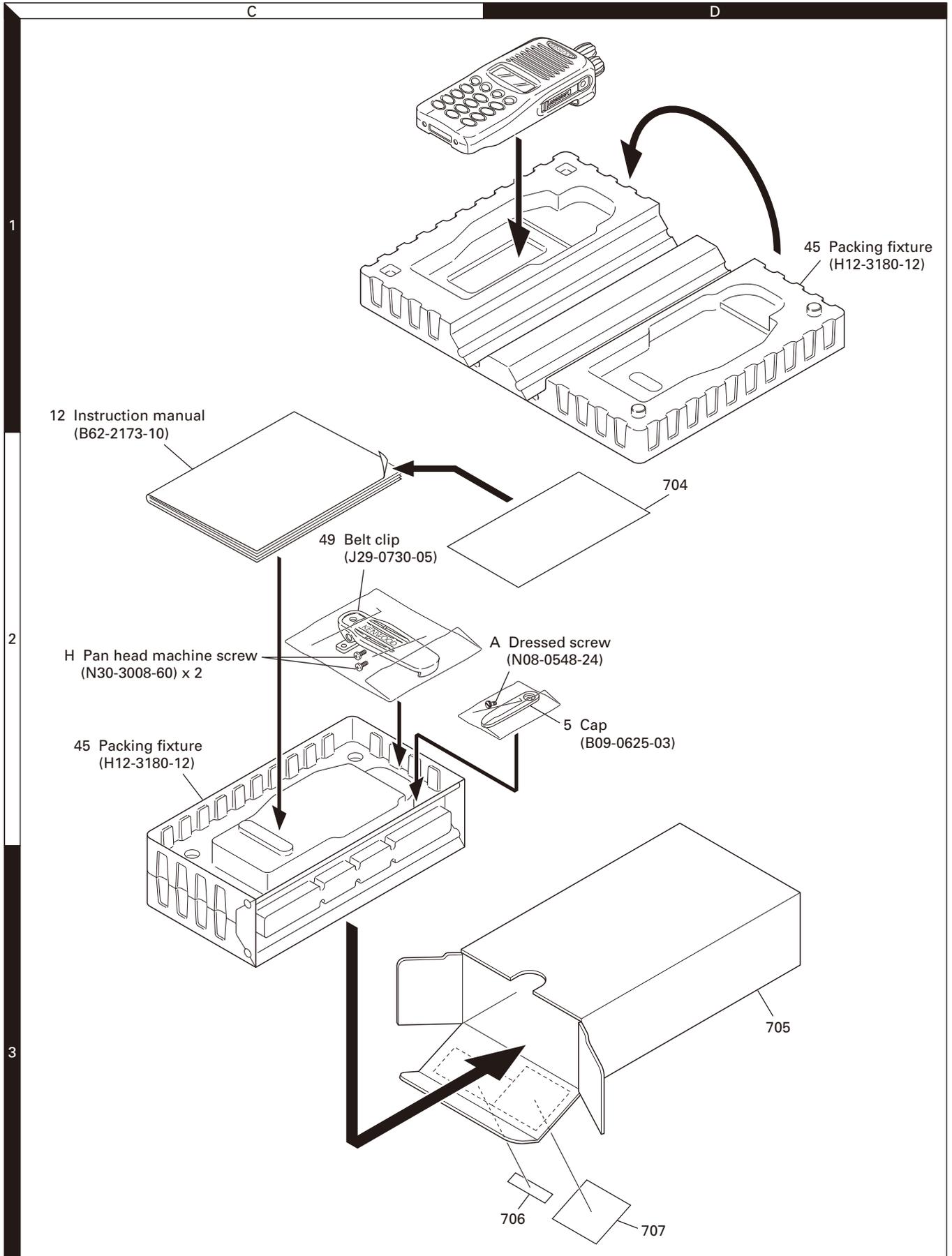
TX-RX UNIT (X57-6932-72)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
IC605			M62364FP-F	MOS-IC		TH200			ERTJ0EV104H	THERMISTOR	
IC606			TC7W53FK (F)	MOS-IC							
IC607			AQUA-L	MOS-IC							
IC608			TC75W51FK (F)	MOS-IC							
IC609			TDA7053AT	BI-POLAR IC							
Q1			DTC144EE	DIGITAL TRANSISTOR							
Q2			2SC5108 (YF)	TRANSISTOR							
Q6,7			2SK508NV (K52)	FET							
Q8,9			2SJ347F	FET							
Q10			2SC5108 (YF)	TRANSISTOR							
Q11			2SC4617 (S)	TRANSISTOR							
Q12			2SK1830F	FET							
Q13			2SC5108 (YF)	TRANSISTOR							
Q14			DTA144EE	DIGITAL TRANSISTOR							
Q101			2SK3077F	FET							
Q102			RD01MUS1-T113	FET							
Q104			2SC4738 (GR)F	TRANSISTOR							
Q105			RD07MVS1BT122	FET							
Q106			DTC114EE	DIGITAL TRANSISTOR							
Q107			2SK1824-A	FET							
Q108			EMD5	TRANSISTOR							
Q200			HN1L02FU (F)	FET							
Q201			2SC4617 (S)	TRANSISTOR							
Q202			2SJ243-A	FET							
Q203			2SK1824-A	FET							
Q204			DTA144EE	DIGITAL TRANSISTOR							
Q205			2SC4649 (N,P)	TRANSISTOR							
Q206			3SK318	FET							
Q207			3SK294-FP	FET							
Q400			UMG9N	TRANSISTOR							
Q401			SSM3K15TE (F)	FET							
Q402			2SK1830F	FET							
Q403		*	2SA1955A-F	TRANSISTOR							
Q404			DTC144EE	DIGITAL TRANSISTOR							
Q405			2SJ347F	FET							
Q406		*	2SA1955A-F	TRANSISTOR							
Q407			2SK1830F	FET							
Q408		*	2SA1955A-F	TRANSISTOR							
Q409			2SJ347F	FET							
Q502			SSM3K15TE (F)	FET							
Q602			DTA114EE	DIGITAL TRANSISTOR							
Q605		*	KTX101U-P	TRANSISTOR							
Q606			2SC4738 (GR)F	TRANSISTOR							
Q607			2SA1832 (GR)F	TRANSISTOR							
Q608-610			2SJ243-A	FET							
Q611			HN1L02FU (F)	FET							
Q612			2SC4617 (S)	TRANSISTOR							
Q613			2SB1132 (Q,R)	TRANSISTOR							
Q614			2SJ347F	FET							
Q615			2SC4617 (S)	TRANSISTOR							
Q616,617		*	UPA672T-A	FET							
Q618			2SK1824-A	FET							
Q619			2SJ243-A	FET							
Q620			DTA144TE	DIGITAL TRANSISTOR							
Q621			2SC4649 (N,P)	TRANSISTOR							
Q622			UFMMT717	TRANSISTOR							
Q623,624			2SK1830F	FET							
Q625,626			2SC4649 (N,P)	TRANSISTOR							
TH100			ERTJ0EV104H	THERMISTOR							

EXPLODED VIEW



PACKING



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

ADJUSTMENT

Controls



Panel Test Mode

■ Test mode operation features

This transceiver has a test mode. **To enter test mode, press [A] key and turn power on. Hold [A] key until frequency version appears on LCD.** Test mode can be inhibited by programming. To exit test mode, switch the power on again. The following functions are available in test mode.

■ Key operation

Key	"FNC" not appears	
	Function	Display
[S]	Shifts to Panel tuning mode	-
[A]	Function on	"FNC" appears
[B]	MSK 1200bps and 2400bps	2400bps : icon appears
[C]	Test signaling CH up	Signaling No.
[Selector]	Test frequency CH up/down	Channel No.
[Side1]	Squelch on/off	
[Side2]	Narrow/Wide	Narrow : "n" Wide : "w"
[PTT]	Transmit	-
[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
[S]	High power / Low power	Low :
[A]	Function off	-
[B]	Compander on/off	On :
[C]	Beat shift on/off	On :
[Selector]	Test frequency CH up/down	-
[Side1]	Squelch level 0	On :
[Side2]	LCD all lights	LCD all point appears
[PTT]	Transmit	-
[0] to [9] and [#],[*]	Function off	-

Note :

If a [S], [A], [B], [C] key is pressed during transmission, the DTMF corresponding to the key that was pressed is sent.

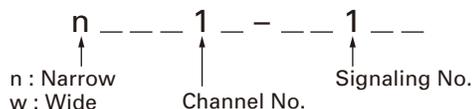
• LED indicator

- Red LED Lights during transmission. Blinks at the low battery voltage warning.
- Green LED Lights when there is carrier.

• Sub LCD indicator

"FNC" Appears at function on.

• LCD display in panel test mode



■ Frequency and Signaling

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

• Test frequency

CH	RX (MHz)	TX (MHz)
1	243.55000	243.60000
2	217.05000	217.10000
3	269.95000	269.90000
4	243.50000	243.50000
5	243.70000	243.70000
6	243.90000	243.90000
7~16	-	-

ADJUSTMENT

• Test signaling

No.	RX	TX
1	None	None
2	None	100Hz Square Wave
3	Skip	
4	QT : 67.0Hz	QT : 67.0Hz
5	QT : 151.4Hz	QT : 151.4Hz
6	QT : 210.7Hz	QT : 210.7Hz
7	QT : 254.1Hz	QT : 254.1Hz
8	DQT : D023N	DQT : D023N
9	DQT : D754I	DQT : D754I
10	DTMF : 159D	DTMF : 159D
11	None	DTMF Code 9
12	Skip	
13	Skip	
14	None	Single Tone : 1000Hz
15	Skip	
16	None	MSK
17	MSK : Data : 0x230960C6AAAA CRC : 0xC4D7	MSK : Data : 0x230960C6AAAA CRC : 0xC4D7

Panel Tuning 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 8Ω 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 place transceiver in tuning mode)

Press [S] key, now in tuning mode. Use [B] key to write tuning data through tuning modes, and [Selector] to adjust tuning requirements (1 to 256 appears on LCD).

Use [C] key to select the adjustment item through tuning modes. Use [A] key to adjust 3 or 5 reference level adjustments, and use [Side2] key to switch between Wide/Narrow.

Channel appears on LCD. Set channel according to tuning requirements.

• LCD display in panel tuning mode

n _ _ B A L _ _ _ 2 5 6

↑ ↑ ↑

n : Narrow Adjustment item Adjustment value (1~256)

w : Wide

■ Key operation

Key	Function	
	Push	Hold (1 second)
[S]	End of panel tuning mode	-
[A]	To enter 3 or 5 reference level adjustments	-
[B]	Writes the adjustment value	-
[C]	Go to next adjustment item	Back to last adjustment item
[Selector]	Adjustment value up/down	
[Volume]	Volume level up/down	
[Side1]	Squelch on/off	-
[Side2]	Selects Narrow, Wide	-

■ 3 or 5 reference level adjustments frequency

Tuning point	RX (MHz)	TX (MHz)
Low	217.05000	217.10000
Low'	230.35000	230.40000
Center	243.55000	243.60000
High'	256.85000	256.90000
High	269.95000	269.90000

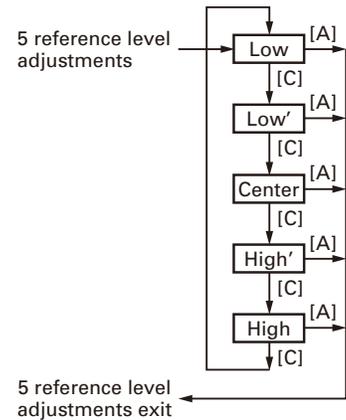
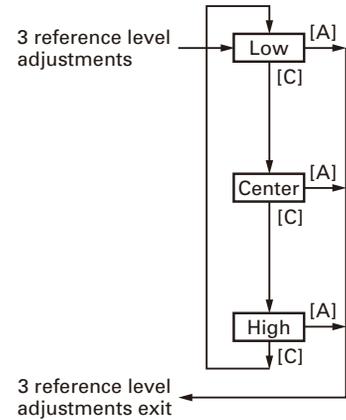
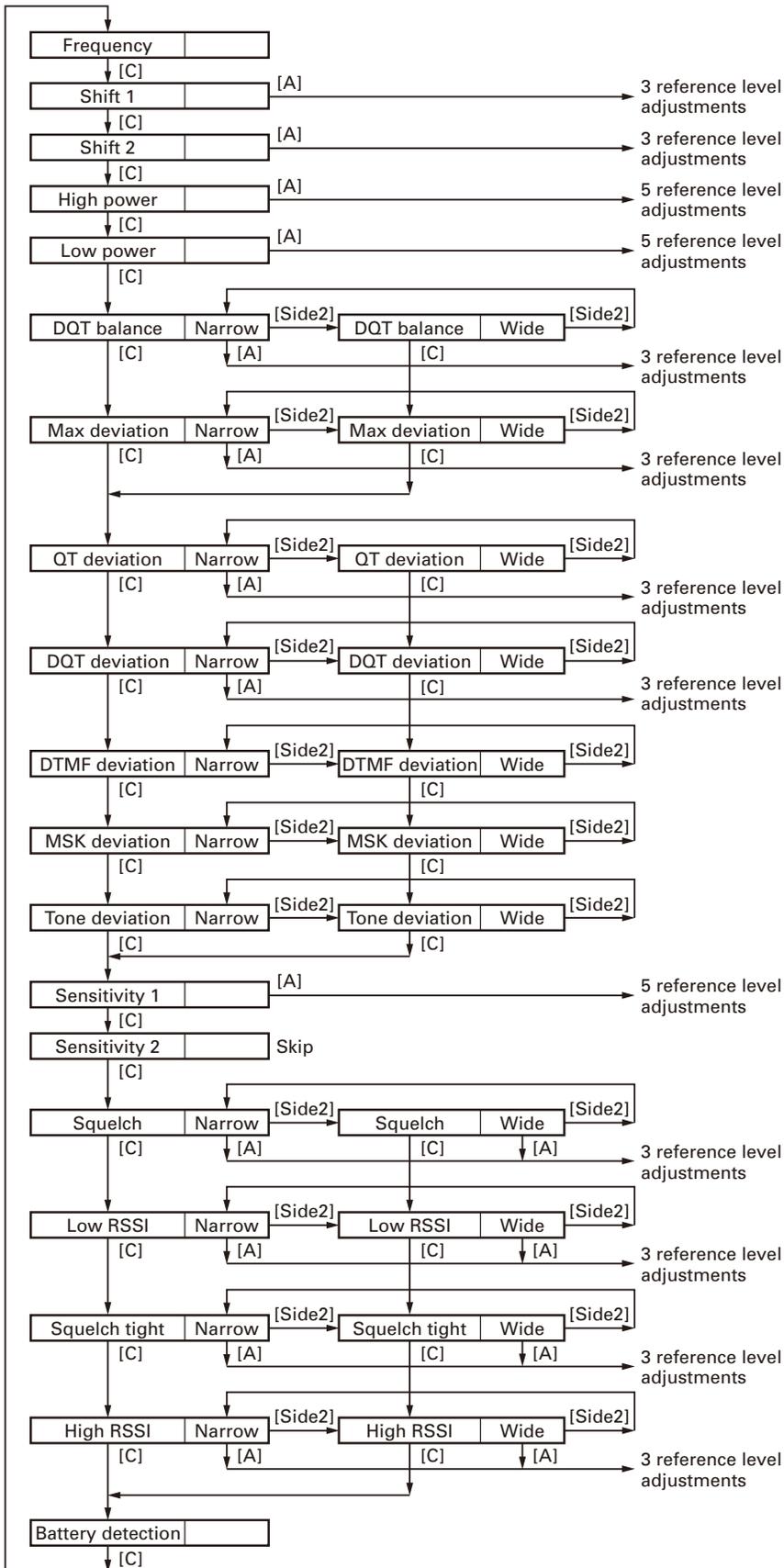
■ Adjustment item and Display

(*** : 1~256, MSK only : 1~64)

Order	Adjustment item	Display
1	Frequency	FREQ_***
2	Shift 1	SHFT1_***
3	Shift 2	SHFT2_***
4	High power	HPWR_***
5	Low power	LPWR_***
6	DQT balance	BAL_***
7	Max deviation	DEV_***
8	QT deviation	QT_***
9	DQT deviation	DQT_***
10	DTMF deviation	DTMF_***
11	MSK deviation	MSK_**
12	Tone deviation	TONE_***
13	Sensitivity 1	SENS1_***
14	Sensitivity 2	SENS2_***
15	Squelch	SQL_***
16	Low RSSI	LRSSI_***
17	Squelch tight	SQLT_***
18	High RSSI	HRSSI_***
19	Battery detection	BATT_***

ADJUSTMENT

Flow chart



ADJUSTMENT

Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range Modulation Output	217 to 270MHz Frequency modulation and external modulation -127dBm/0.1μV to greater than -47dBm/1mV
2. Power Meter	Input Impedance Operation Frequency Measurement Capability	50Ω 217 to 270MHz or more Vicinity of 10W
3. Deviation Meter	Frequency Range	217 to 270MHz
4. Digital Volt Meter (DVM)	Measuring Range Input Impedance	10mV to 10V DC High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range Frequency Stability	10Hz to 1000MHz 0.2ppm or less
7. Ammeter		5A
8. AF Volt Meter (AF VTVM)	Frequency Range Voltage Range	50Hz to 10kHz 1mV to 10V
9. Audio Generator (AG)	Frequency Range Output	50Hz to 5kHz or more 0 to 1V
10. Distortion Meter	Capability Input Level	3% or less at 1kHz 50mV to 10Vrms
11. 8Ω Dummy Load		Approx. 8Ω, 3W
12. Regulated Power Supply		5V to 10V, approx. 5A Useful if ammeter equipped

■ Battery Jig

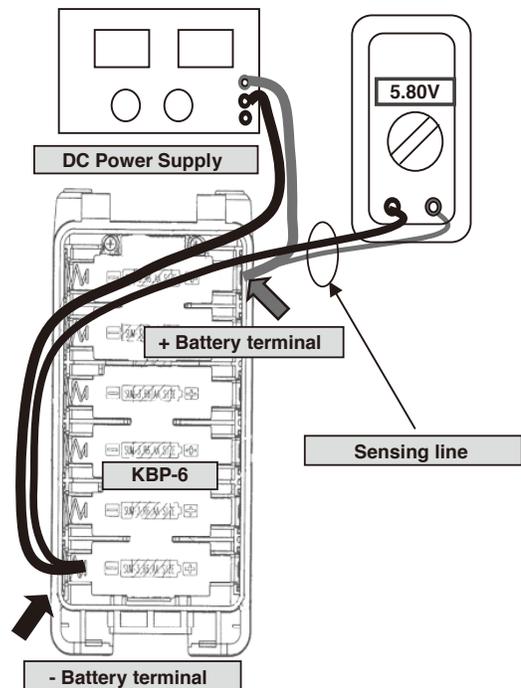
The optional KBP-6 battery case can be used as a battery JIG using the following modification (please refer to the following diagram).

About this Battery JIG:

The "(S) terminal" of KBP-6 is shorted with "(-) terminal" for distinguishing the Battery Case.

<Recommendation for TX inhibit voltage adjustment and its check method>

We recommend that you increase the DC power supply voltage to about 0.2V higher than the "TX inhibit voltage" before pressing the PTT switch. Then press the PTT switch and decrease the DC power supply voltage to the target level (such as 5.8V) for the adjustment check in TX mode.



Notice :

The battery voltage for TX inhibit should be measured at the "Battery terminal", such as the sensing line, not the DC power supply terminal. Generally, there is approximately a 0.1 to 0.3V loss through the cable, causing a difference between the DC power supply and the Battery terminal.

ADJUSTMENT

■ Universal connector

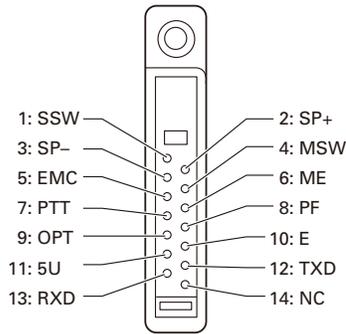
Use the interface cable (KPG-36/36A) for PC tuning or the lead wire with plug (E30-3287-28) and screw (N08-0535-08) for panel tuning. Connect the plug to the universal connector of the transceiver and tighten the screw.

The lead wire with plug (E30-3287-28) and screw (N08-0535-08) terminals are as follows. Numbers are universal connector terminal numbers.

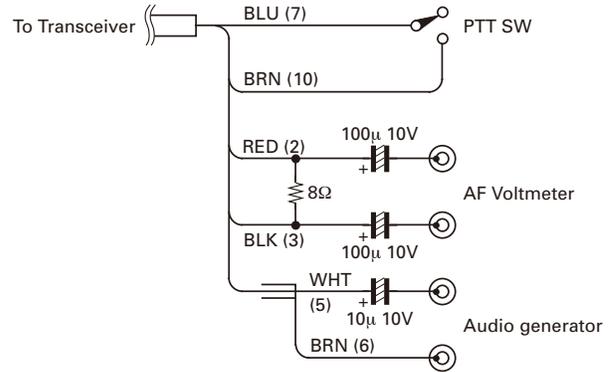
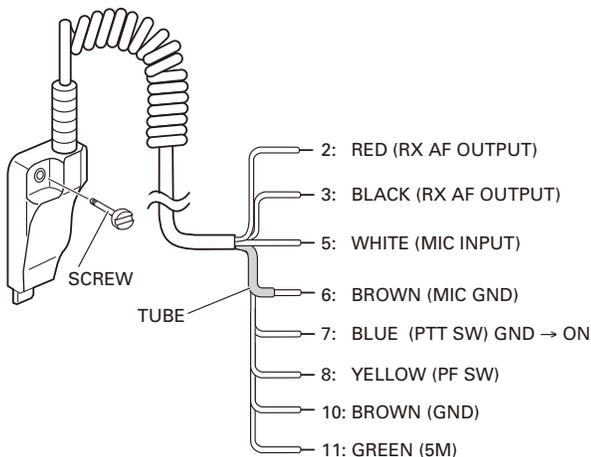
Caution

1. When connecting the plug to the universal connector of the transceiver, a short circuit may occur. To prevent this, be sure to turn the transceiver POWER switch off.
2. 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.
3. Do not connect an instrument between red or black and GND.

• Universal connector



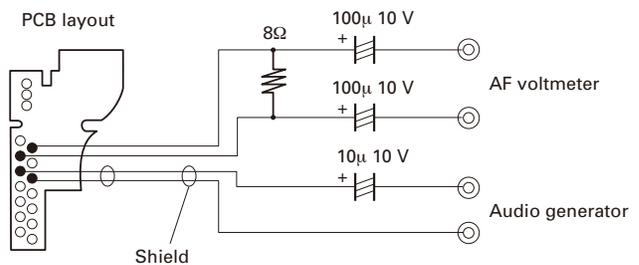
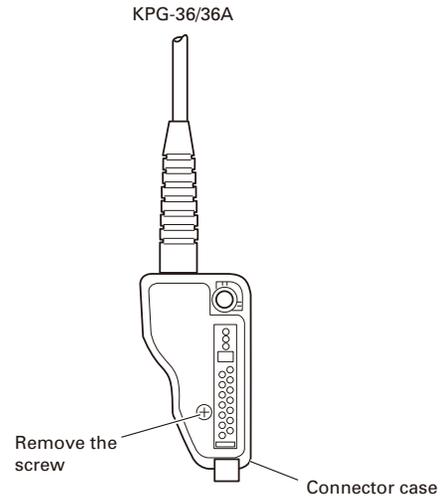
• Panel tuning



• PC tuning

Connect the wires to the PCB in the connector case of interface cable.

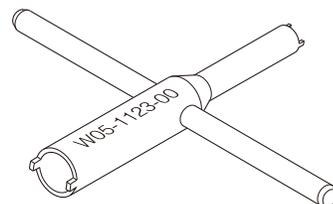
For output the wires out of the connector case, need to process the connector case.



■ Nut wrench

In order to turn the volume nut and the channel selector nut, use a recommendation tool.

KENWOOD part No. : W05-1123-00



ADJUSTMENT

Common Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks	
		Test-equipment	Unit	Terminal	Unit	Parts	Method		
1. Setting	1) BATT terminal voltage : 7.5V 2) SSG standard modulation [Wide] MOD : 1kHz, DEV : 3kHz [Narrow] MOD : 1kHz, DEV : 1.5kHz								
2. VCO lock voltage • RX	[Panel test mode] 1) CH-Sig : 3-1	Power meter	Panel	ANT	TX-RX	TC2	4.2V	±0.1V	
	2) CH-Sig : 2-1	DVM	TX-RX	CV			Check	0.7V or more	
	• TX	[Panel tuning mode] LPWR* 3) CH-Sig : 3-1 PTT : ON				TX-RX	TC1	4.2V	±0.1V
		4) CH-Sig : 2-1 PTT : ON						Check	0.7V or more

* TX can be continued on unlock condition in panel tuning mode.

Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency adjust	1) Adj item : [FREQ] Adjust : [***] PTT : ON	f. counter	Panel	ANT	Panel	Selector knob	Center frequency ±40Hz	Note : After replacing the TCXO (X1) align frequency.
2. Frequency shift 1 adjust	1) Adj item : [SHFT1] Adjust : [***] 2) Adj item : [L SHFT1] → [C SHFT1] → [H SHFT1] Adjust : [***] PTT : ON						[L SHFT1] Low frequency+1.25kHz [C SHFT1] Center frequency+1.25kHz [H SHFT1] High frequency+1.25kHz	±40Hz
3. Frequency shift 2 adjust	1) Adj item : [SHFT2] Adjust : [***] 2) Adj item : [L SHFT2] → [C SHFT2] → [H SHFT2] Adjust : [***] PTT : ON						[L SHFT2] Low frequency+2.5kHz [C SHFT2] Center frequency+2.5kHz [H SHFT2] High frequency+2.5kHz	±40Hz
4. High power adjust	1) Adj item : [HPWR] Adjust : [***] 2) Adj item : [L HPWR] → [L' HPWR] → [C HPWR] → [H' HPWR] → [H HPWR] Adjust : [***] BATT terminal voltage : 7.5V PTT : ON	Power meter Ammeter					5.0W	±0.1W 2.0A or less
5. High power check	[Panel test mode] 1) CH-Sig : 1-1 PTT : ON						Check	4.5~5.5W 2.1A or less
	2) CH-Sig : 2-1 PTT : ON							
	3) CH-Sig : 3-1 PTT : ON							

ADJUSTMENT

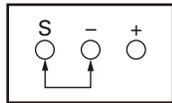
Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. Low power adjust	1) Adj item : [LPWR] Adjust : [***] 2) Adj item : [L LPWR] → [L' LPWR] → [C LPWR] → [H' LPWR] → [H LPWR] Adjust : [***] BATT terminal voltage : 7.5V PTT : ON	Power meter Ammeter	Panel	ANT	Panel	Selector knob	1.0W	±0.1W 1.0A or less
7. Low power check	[Panel test mode] 1) CH-Sig : 1-1 Set low power (Push [S]) PTT : ON						Check	0.7~1.4W 1.2A or less
	2) CH-Sig : 2-1 PTT : ON							
	3) CH-Sig : 3-1 PTT : ON							
8. DQT balance adjust • Narrow	1) Adj item : [n BAL] Adjust : [***] Deviation meter filter LPF : 3kHz HPF : OFF 2) Adj item : [nL BAL] → [nC BAL] → [nH BAL] Adjust : [***] PTT : ON	Deviation meter Oscilloscope AG AF VTVM	Panel	ANT Universal connector	Panel	Selector knob	Make the demodulation waves into square waves.	
• Wide	3) Adj item : [w BAL] Adjust : [***] PTT : ON							
9. Max DEV adjust • Narrow	1) Adj item : [n DEV] Adjust : [***] AG : 1kHz/125mV at MIC terminal Deviation meter filter LPF : 15kHz HPF : OFF 2) Adj item : [nL DEV] → [nC DEV] → [nH DEV] Adjust : [***] PTT : ON						2.10kHz (According to the larger +, -)	±50Hz
• Wide	3) Adj item : [w DEV] Adjust : [***] PTT : ON						4.2kHz (According to the larger +, -)	±50Hz
10. MIC sensitivity check	[Panel test mode] 1) CH-Sig : 1-1 DEV : 1.5kHz (Narrow) 3.0kHz (Wide) Deviation meter filter LPF : 15kHz HPF : OFF PTT : ON						Adjust the AG output to the point that the deviation becomes the level indicated in the "Condition" column.	AG : 1kHz/6.7mV ~ 18.3mV at MIC terminal

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
11. QT deviation adjust • Narrow	1) Remove the panel tuning cable assembly from the universal connector. Adj item : [n QT] Adjust : [***] Deviation meter filter LPF : 3kHz HPF : OFF 2) Adj item : [nL QT] → [nC QT] → [nH QT] Adjust : [***] PTT : ON	Power meter Deviation meter Oscilloscope AG AF VTVM	Panel	ANT Universal connector	Panel	Selector knob	0.35kHz	±50Hz
	• Wide						3) Adj item : [w QT] Adjust : [***] PTT : ON	0.75kHz
12. DQT deviation adjust • Narrow	1) Adj item : [n DQT] Adjust : [***] Deviation meter filter LPF : 3kHz HPF : OFF 2) Adj item : [nL DQT] → [nC DQT] → [nH DQT] Adjust : [***] PTT : ON						0.35kHz	±50Hz
	• Wide						3) Adj item : [w DQT] Adjust : [***] PTT : ON	0.75kHz
13. DTMF deviation adjust • Narrow	1) Adj item : [n DTMF] Adjust : [***] Deviation meter filter LPF : 15kHz HPF : OFF PTT : ON						1.25kHz	±0.1kHz
	• Wide						2) Adj item : [w DTMF] Adjust : [***] PTT : ON	2.5kHz
14. MSK deviation adjust • Narrow	1) Adj item : [n MSK] Adjust : [**] Deviation meter filter LPF : 15kHz HPF : OFF PTT : ON						1.5kHz	±0.1kHz
	• Wide						2) Adj item : [w MSK] Adjust : [**] PTT : ON	3.0kHz
15. TONE deviation adjust • Narrow	1) Adj item : [n TONE] Adjust : [***] Deviation meter filter LPF : 15kHz HPF : OFF PTT : ON						1.5kHz	±0.1kHz
	• Wide						2) Adj item : [w TONE] Adjust : [***] PTT : ON	3.0kHz

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
16. BATT detection writing	1) Adj item : [BATT] Adjust : [***] PTT : ON	Power meter DVM	Panel	ANT BATT terminal	Panel		After pressing the PTT switch, confirm that one predetermined numeric in the range 1 to 256 appears and then press [B] key. That numeric will be stored in memory.	BATT terminal voltage : 5.8V
17. BATT detection check	[Panel test mode] 1) CH-Sig : 1-1 BATT terminal voltage : 6.6V Connect "S" terminal to GND. PTT : ON	Power meter DVM	Panel	ANT BATT terminal	Panel		Check	The transceiver can transmit without causing the LED to blink.
	2) BATT terminal voltage : 5.8V Connect "S" terminal to GND. PTT : ON							The transceiver should not transmit and LED blinking.



Receiver Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Sensitivity 1 adjust	1) Adj item : [SENS1] Adjust : [***] 2) Adj item : [L SENS1] → [L' SENS1] → [C SENS1] → [H' SENS1] → [H SENS1] Adjust : [***] SSG output : -118dBm (0.28μV) (MOD : 1kHz/±1.5kHz)	SSG AF VTVM Oscilloscope	Panel	ANT Universal connector	Panel	Selector knob	Adjust for 12dB SINAD	Rotate the selector knob and increase the adjustment value starting from "1" to obtain SINAD 12dB.
2. Sensitivity check	[Panel test mode] 1) CH-Sig : 1-1 SSG output Wide : -117dBm (0.32μV) (MOD : 1kHz/±3kHz) Narrow : -117dBm (0.32μV) (MOD : 1kHz/±1.5kHz)						Check	12dB SINAD or more

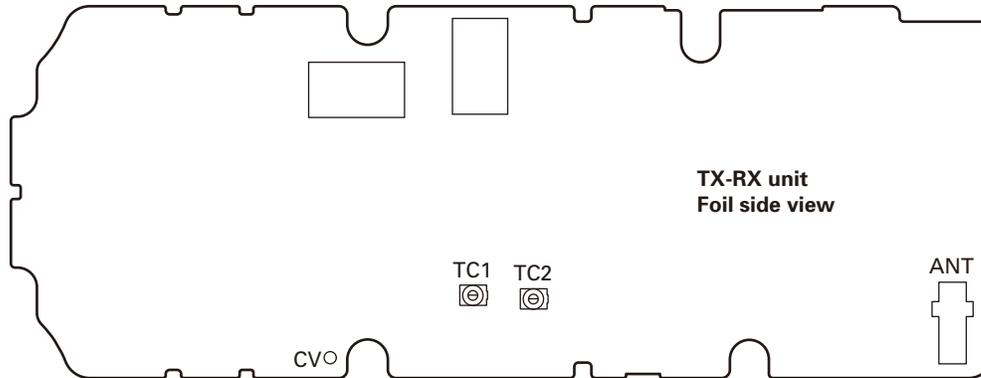
ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Squelch (Preset) adjust • Narrow	1) Adj item : [n SQL] Adjust : [***] SSG output : -118dBm (0.28μV) (MOD : 1kHz/±1.5kHz)	SSG	Panel	ANT	Panel	Selector knob	After input signal from SSG, press [B] key. That numeric will be stored in memory.	After adjusting SQL, check SQL open/close. SSG -118dBm : Open SSG OFF : Close [nC SQL] MOD 1kHz/±1.5kHz [wC SQL] MOD 1kHz/±3.0kHz
	2) Adj item : [nL SQL] → [nC SQL] → [nH SQL] Adjust : [***]	AF VTVM Oscilloscope		Universal connector				
	• Wide	3) Adj item : [w SQL] Adjust : [***] SSG output : -118dBm (0.28μV) (MOD : 1kHz/±3.0kHz)						
	4) Adj item : [wL SQL] → [wC SQL] → [wH SQL] Adjust : [***]							
4. Low RSSI adjust • Narrow	1) Adj item : [n LRSSI] Adjust : [***] SSG output : -118dBm (0.28μV) (MOD : 1kHz/±1.5kHz)					After input signal from SSG, press [B] key. That numeric will be stored in memory.		
	2) Adj item : [nL LRSSI] → [nC LRSSI] → [nH LRSSI] Adjust : [***]							
	• Wide	3) Adj item : [w LRSSI] Adjust : [***] SSG output : -118dBm (0.28μV) (MOD : 1kHz/±3.0kHz)						
	4) Adj item : [wL LRSSI] → [wC LRSSI] → [wH LRSSI] Adjust : [***]							
5. Squelch (Tight) adjust • Narrow	1) Adj item : [n SQLT] Adjust : [***] SSG output : -113dBm (0.5μV) (MOD : 1kHz/±1.5kHz)					After input signal from SSG, press [B] key. That numeric will be stored in memory.	After adjusting SQL, check SQL open/close. SSG -113dBm : Open SSG OFF : Close [nC SQLT] MOD 1kHz/±1.5kHz [wC SQLT] MOD 1kHz/±3.0kHz	
	2) Adj item : [nL SQLT] → [nC SQLT] → [nH SQLT] Adjust : [***]							
	• Wide	3) Adj item : [w SQLT] Adjust : [***] SSG output : -113dBm (0.5μV) (MOD : 1kHz/±3.0kHz)						
	4) Adj item : [wL SQLT] → [wC SQLT] → [wH SQLT] Adjust : [***]							

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. High RSSI adjust • Narrow	1) Adj item : [n HRSSI] Adjust : [***] SSG output : -70dBm (70.7μV) (MOD : 1kHz/±1.5kHz)	SSG AF VTVM Oscilloscope	Panel	ANT	Panel	Selector knob	After input signal from SSG, press [B] key. That numeric will be stored in memory.	
	Universal connector							
2) Adj item : [nL HRSSI] → [nC HRSSI] → [nH HRSSI] Adjust : [***]								
• Wide								
• Wide	3) Adj item : [w HRSSI] Adjust : [***] SSG output : -70dBm (70.7μV) (MOD : 1kHz/±3.0kHz)							
	4) Adj item : [wL HRSSI] → [wC HRSSI] → [wH HRSSI] Adjust : [***]							

Adjustment Points



TERMINAL FUNCTION

Display unit (X54-3472-72)

Pin No.	Name	I/O	Function
CN507			
1	SW2	O	Key matrix output (Side2 key)
2	K1	I	Key matrix input (Side key)
3	GND	-	GND
4	PTT	I	PTT input
5	SW1	O	Key matrix output (Side1 key)
CN508			
1	NC	-	No connection
2	V5	O	LCD driving voltage output
3	Vss	-	GND
4	V5OUT	I	Step up voltage input
5	C2-	-	Step up capacitor connecting terminal
6	C2+	-	Step up capacitor connecting terminal
7	C1-	-	Step up capacitor connecting terminal
8	C1+	-	Step up capacitor connecting terminal
9	Vci	O	Voltage converter power supply output
10	VDD	O	LCD power supply output
11	OSC1	-	No connection
12	OSC2	-	No connection
13	RESET	O	LCD reset output
14	P/S	O	GND
15	RS	O	Register select output
16	R/W	O	GND
17	SCL	O	Serial clock output
18	SIO	O	Serial data output
19	CS	O	Chip select output
20	Vss	-	GND
CN509			
1	NC	-	No connection
2	NC	-	No connection
3	NC	-	No connection
4	LCDRS	I	LCD RS input
5	AGND	-	GND
6	ME	-	Internal microphone ground
7	MIC	O	Internal microphone output
8	PTT	O	PTT output
9	SPSTB	I	Shift register storage enable input
10	CLK	I	Serial clock input
11	DATA	I	Serial data input
12	KI1	O	Key matrix 1 output
13	KI2	O	Key matrix 2 output
14	NC	-	No connection
15	SB2	I	Power input after power switch
16	NC	-	No connection

Pin No.	Name	I/O	Function
17	DGND	-	GND
18	LCDCS	I	LCD chip select input
19	LCDRST	I	LCD reset input
20	5M	I	5V

TX-RX unit (X57-6932-72)

Pin No.	Name	I/O	Function
CN400			
1	SB1	I	Power input after power switch
2	+B	O	Power output after passing through the fuse
3	EN3	I	Encoder pulse input
4	EN4	I	Encoder pulse input
5	DGND	-	GND
6	EN2	I	Encoder pulse input
7	EN1	I	Encoder pulse input
8	DGND	-	GND
9	VOL	I	Volume level input for audio control
10	5M	O	5V
CN500			
1	5M	O	5V
2	LCDRST	O	LCD reset output
3	LCDCS	O	LCD chip select output
4	DGND	-	GND
5	NC	-	No connection
6	SB2	O	Power output after power switch
7	NC	-	No connection
8	KI2	I	Key matrix 2 input
9	KI1	I	Key matrix 1 input
10	DATA	O	Serial data output
11	CLK	O	Serial clock output
12	SPSTB	O	Shift register storage enable output
13	PTT	I	PTT input
14	MIC	I	Internal microphone input
15	ME	-	Internal microphone ground
16	AGND	-	GND
17	LCDRS	O	LCD RS output
18	NC	-	No connection
19	NC	-	No connection
20	NC	-	No connection

TERMINAL FUNCTION

Pin No.	Name	I/O	Function
CN600			
1	OPT1	I/O	Option board I/F 1 Output : $L \leq 0.45V$, $H \geq 4.7V/25k\Omega$ load Input : $L \leq 1.0V$, $H \geq 4.0V$, Input voltage : $0V \sim 5.0V$
2	OPT3	I/O	Option board I/F 3 Output : $L \leq 0.45V$, $H \geq 4.7V/25k\Omega$ load Input : $L \leq 1.0V$, $H \geq 4.0V$, Input voltage : $0V \sim 5.0V$
3	RXD1	I	Serial data input Input : $L \leq 1.0V$, $H \geq 4.0V$, Input voltage : $0V \sim 5.0V$
4	TXD1	O	Serial data output / PTT signal output (Scrambler board) Output : $L \leq 0.45V$, $H \geq 4.7V/25k\Omega$ load
5	NC	-	No connection
6	OPT4	O	Option board I/F 4 Output : $L \leq 0.45V$, $H \geq 4.7V/25k\Omega$ load
7	USEL	O	UART speed select output L : 19200bps fixed
8	OPT5	O	Option board I/F 5 Output : $L \leq 0.45V$, $H \geq 4.7V/25k\Omega$ load
9	DGND	-	GND
10	AGND	-	GND
11	AI	I	VGS audio input $Z_{in} \geq 10k\Omega$, 1Vp-p max, Input voltage : $0V \sim 5.0V$
12	AO	O	VGS audio output $Z_o \geq 10k\Omega$
13	AGND	-	GND
14	5A	O	5V power supply output 78mA max
15	STON	I	Side tone input 1kHz, 5Vp-p
16	DI/ANI	I	Data signal input $Z_{in} \geq 22k\Omega$, 600±200mVp-p
17	TCONT	I	Speaker mute signal input Input : $L \leq 1.0V$, $H \geq 4.0V$, Input voltage : $0V \sim 5.0V$
18	MAN DOWN	O	Man down output Output : $L \leq 0.45V$, $H \geq 4.7V/25k\Omega$ load
19	INH	I	MIC mute signal input
20	OPT2	I/O	Option board I/F 2 Output : $L \leq 0.45V$, $H \geq 4.7V/25k\Omega$ load Input : $L \leq 1.0V$, $H \geq 4.0V$, Input voltage : $0V \sim 5.0V$
21	TXO	O	MIC signal output (AC coupled) before pre-emphasis $Z_L \geq 22k\Omega$, 130±50mVp-p
22	RXEO	O	Audio signal output (DC coupled) after de-emphasis $Z_L \geq 30k\Omega$, 1±0.3Vp-p
23	RXEI	I	Audio signal input (DC coupled) after de-emphasis $Z_{in} \geq 15k\Omega$, 1±0.3Vp-p
24	TXI	I	MIC signal input (AC coupled) before pre-emphasis $Z_{in} \geq 22k\Omega$, 130±50mVp-p

Pin No.	Name	I/O	Function
25	OPT6	O	Option board I/F 6 Output : $L \leq 0.45V$, $H \geq 4.7V/25k\Omega$ load
26	SB2	O	Power input after power switch 7.5V typ, 100mA max
CN602			
1	NC	-	No connection
2	RXD	I	Serial data input
3	TXD	O	Serial data output
4	5U	O	5V output
5	E	-	GND
6	OPT	I/O	Option interface I/O
7	PF	I	Programmable function key input
8	PTT	I	External PTT input
9	ME	-	External microphone ground
10	EMC	I	External microphone input
11	MSW	I	EXT/INT MIC switch input
12	SP-	O	BTL output - for external speaker
13	SP+	O	BTL output + for external speaker
14	SSW	I	EXT/INT speaker switch input

TERMINAL FUNCTION

Universal connector

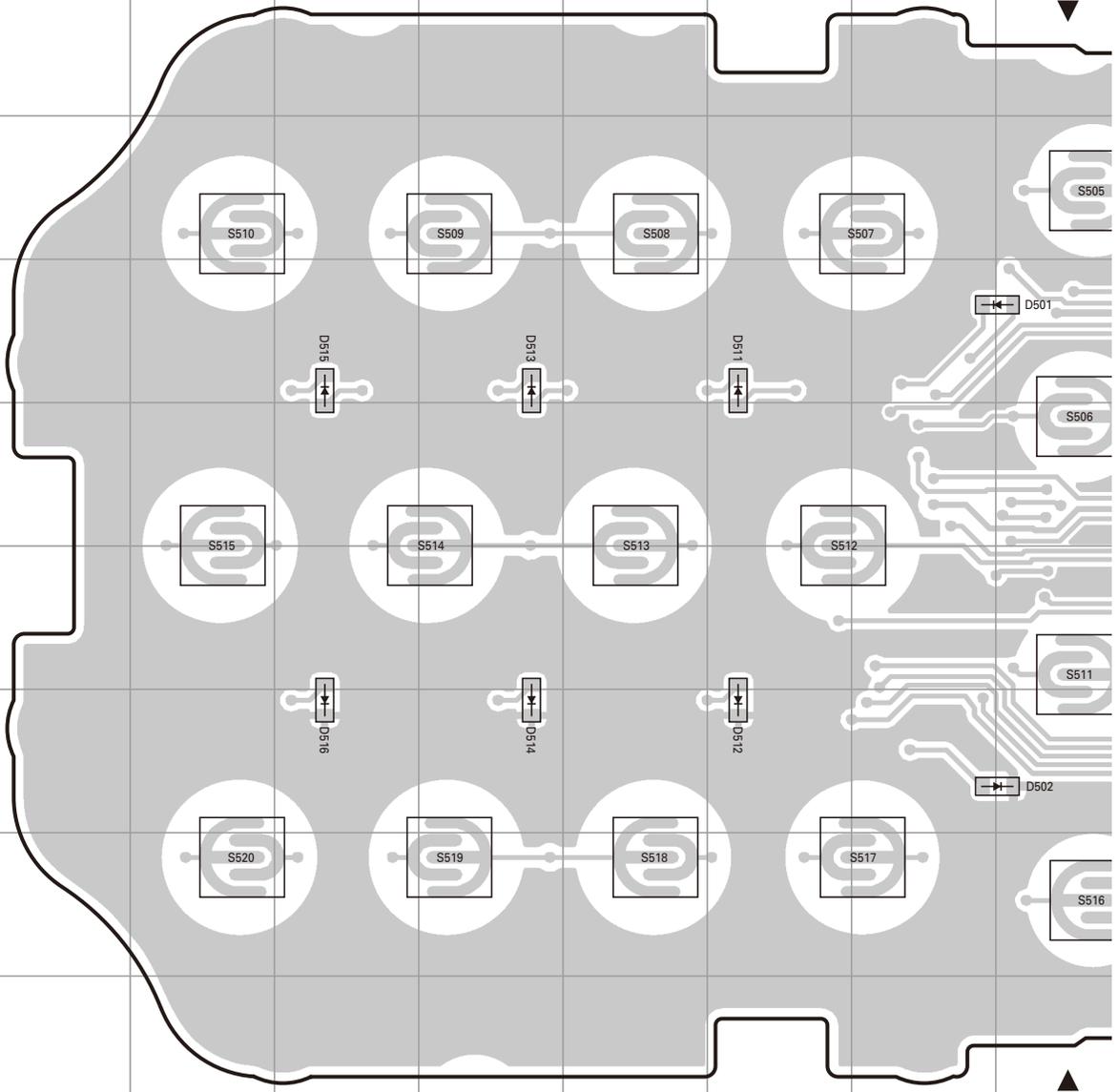
Pin No.	Name	I/O	Function
1	SSW	I	EXT/INT speaker switch input L : External speaker ON, H : Internal speaker ON, Input voltage : 0V~5.0V
2	SP+	O	BTL output + for external speaker Audio output power at volume max (1kHz, Batt =7.5V) 1.3±0.5W typ (at RL=8Ω) 0.9±0.5W typ (at RL=16Ω)
3	SP-	O	BTL output - for external speaker Audio output power at volume max (1kHz, Batt =7.5V) 1.3±0.5W typ (at RL=8Ω) 0.9±0.5W typ (at RL=16Ω)
4	MSW	I	EXT/INT MIC switch Input L : External Mic ON, H : Internal Mic ON Input voltage : 0V~5.0V
5	EMC	I	External MIC input Impedance : 1.8kΩ typ (at 1kHz) Audio level : 7.5±2.5mVrms for 60% of system deviation Nominal DC voltage : 5.0±1V DC
6	ME	-	External MIC GND
7	PTT	I	External PTT input L : PTT ON
8	PF	I	Programmable function key input Input voltage : 0V~5.0V Input level : 4.4V~5.0V (None), 3.1V~4.4V (PF2 key ON), 2.3V~3.1V (PF1 key ON), 0V~2.3V (PF1,PF2 key ON) (Pull up to 5V 10kΩ)
9	OPT	-	No connection
10	E	-	GND
11	5U	O	5V power supply output Max output current : 140mA
12	TXD	O	Serial data output L ≤ 0.45V, H ≥ 4.7V/25kΩ load Baud rate : 115200bps max
13	RXD	I	Serial data input Input : L ≤ 1.0V, H ≥ 4.0V, Input voltage : 0V~5.0V Baud rate : 57600bps max
14	NC (E)	-	Not use (GND)

Solder pad

Name	I/O	Function
OPT5	O	Option board I/F 5 Output : L ≤ 0.45V, H ≥ 4.7V/25kΩ load
OPT6	O	Option board I/F 6 Output : L ≤ 0.45V, H ≥ 4.7V/25kΩ load
OPT3	I/O	Option board I/F 3 Output : L ≤ 0.45V, H ≥ 4.7V/25kΩ load Input : L ≤ 1.0V, H ≥ 4.0V, Input voltage : 0V~5.0V
OPT1	O	Option board I/F 1 Output : L ≤ 0.45V, H ≥ 4.7V/25kΩ load
RXD	I	Serial data input Input : L ≤ 1.0V, H ≥ 4.0V, Input voltage : 0V~5.0V
TXD	O	Serial data output Output : L ≤ 0.45V, H ≥ 4.7V/25kΩ load
RXI	I	Audio signal input (DC coupled) before de-emphasis
STON	I	Side tone input 1kHz, 5Vp-p
TCNT	I	Speaker mute signal input Input : L ≤ 1.0V, H ≥ 4.0V, Input voltage : 0V~5.0V
TXO	O	MIC signal output (AC coupled) before pre-emphasis ZL ≥ 22kΩ, 130±50mVp-p
RXEO	O	Audio signal output (DC coupled) after de-emphasis ZL ≥ 30kΩ, 1±0.3Vp-p
OPT2	I/O	Option board I/F 2 Output : L ≤ 0.45V, H ≥ 4.7V/25kΩ load Input : L ≤ 1.0V, H ≥ 4.0V, Input voltage : 0V~5.0V
OPT4	O	Option board I/F 4 Output : L ≤ 0.45V, H ≥ 4.7V/25kΩ load
GND	-	GND
SB2	I	Power input after power switch 7.5V typ, 100mA max
RXEI	I	Audio signal input (DC coupled) after de-emphasis Zin ≥ 15kΩ, 1±0.3Vp-p
TXI	I	MIC signal input (AC coupled) before pre-emphasis Zin ≥ 22kΩ, 130±50mVp-p
RXO	O	Audio signal output (DC coupled) before de-emphasis
5A	O	5V power supply output 78mA max
DI/A	I	Data signal input Zin ≥ 22kΩ, 600±200mVp-p
INH	O	MIC mute signal input
RSSI	O	RSSI output Zo=56kΩ
MDSW	I	Man down switch input Input : L ≤ 1.0V, H ≥ 4.0V, Input voltage : 0V~5.0V
GND	-	GND for man down switch
RXD1	I	Serial data input Input : L ≤ 1.0V, H ≥ 4.0V, Input voltage : 0V~5.0V
TXD1	O	Serial data output / PTT signal output (Scrambler board) Output : L ≤ 0.45V, H ≥ 4.7V/25kΩ load

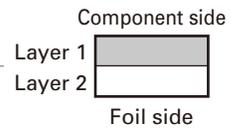
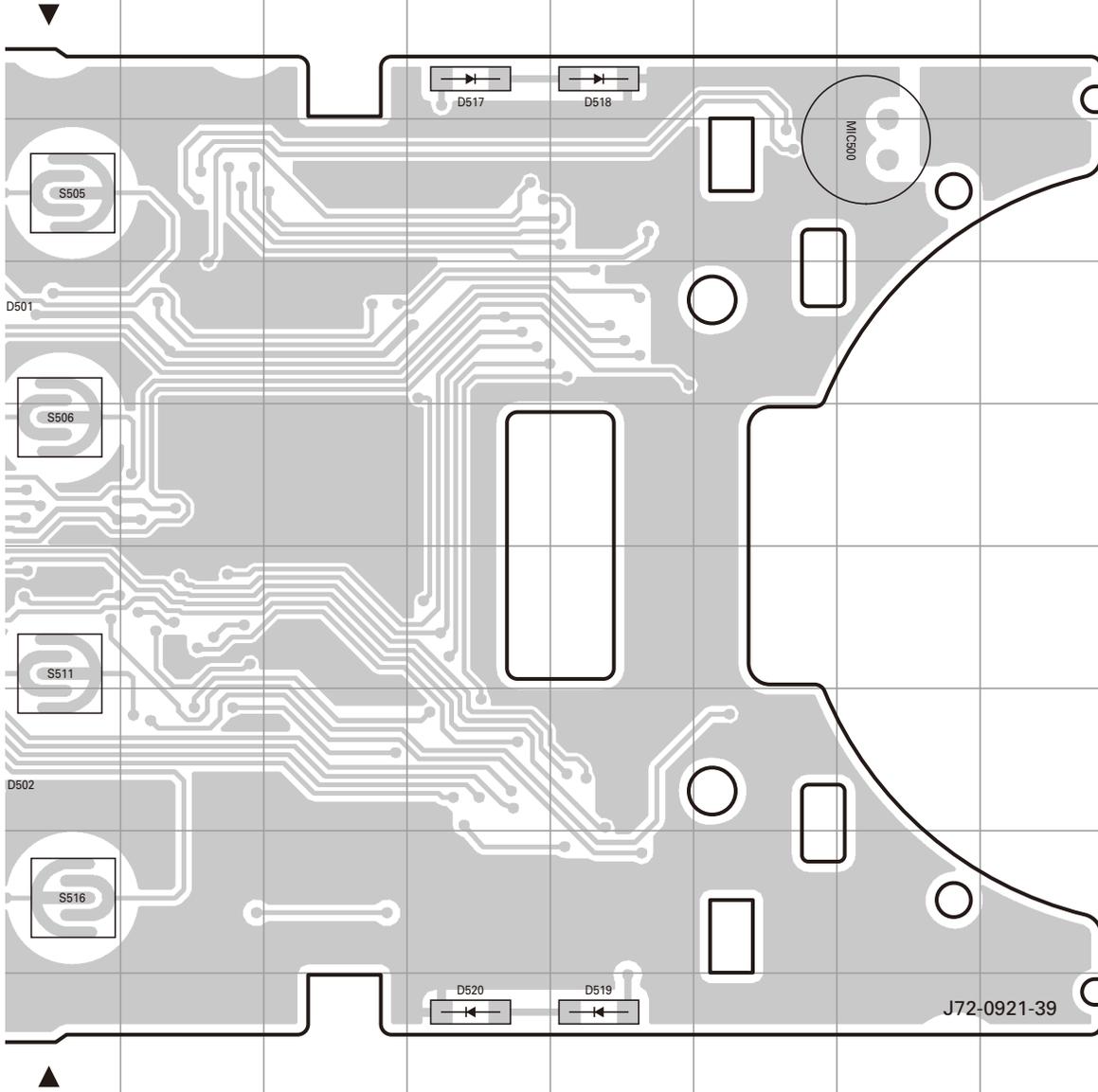
TK-2185 PC BOARD

DISPLAY UNIT (X54-3472-72) Component side view (J72-0921-39)



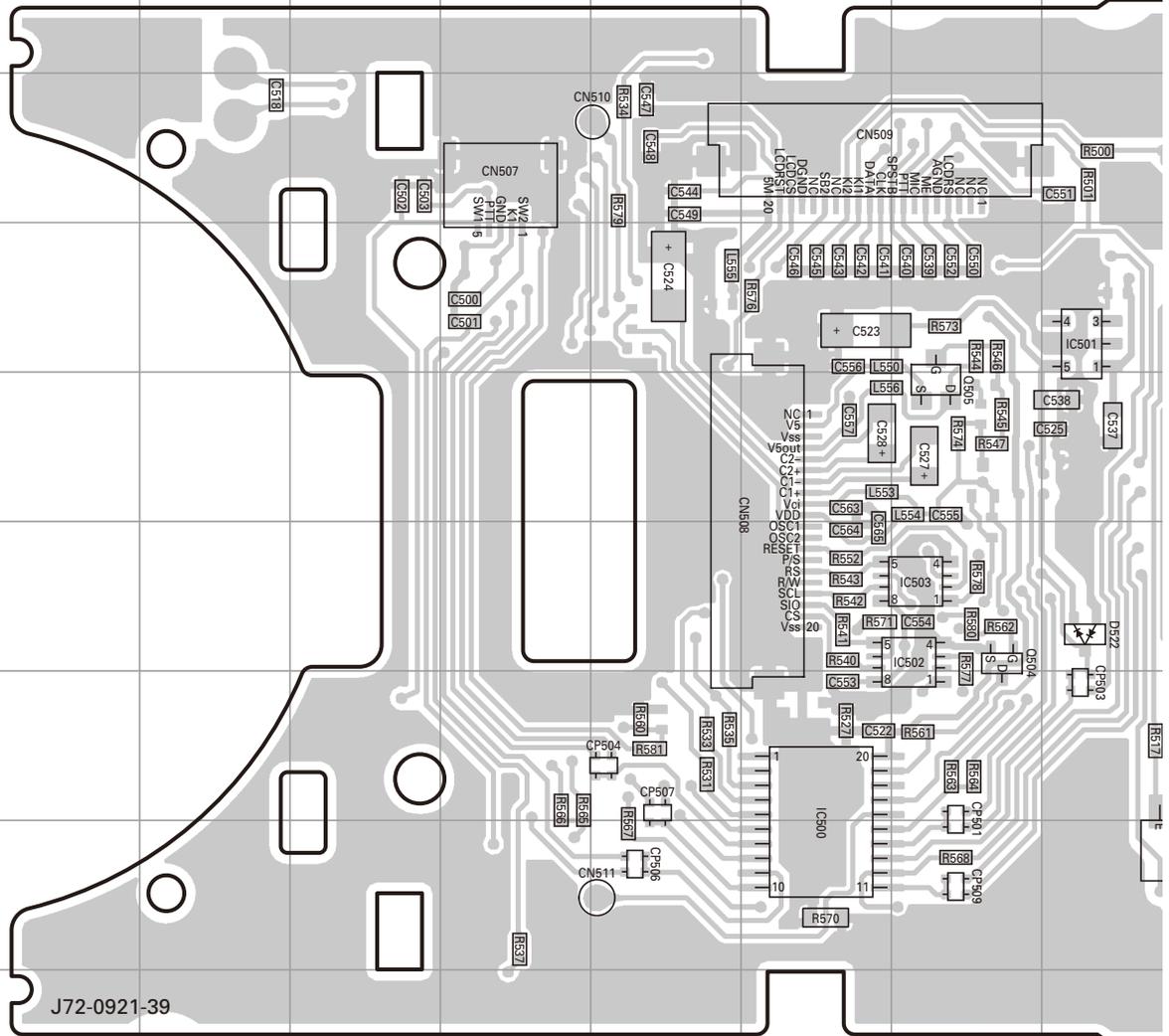
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D513	5F	D519	10N
D514	8F	D520	10M

DISPLAY UNIT (X54-3472-72)
Component side view (J72-0921-39)



TK-2185 PC BOARD

DISPLAY UNIT (X54-3472-72) Foil side view (J72-0921-39)

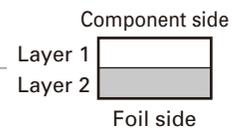
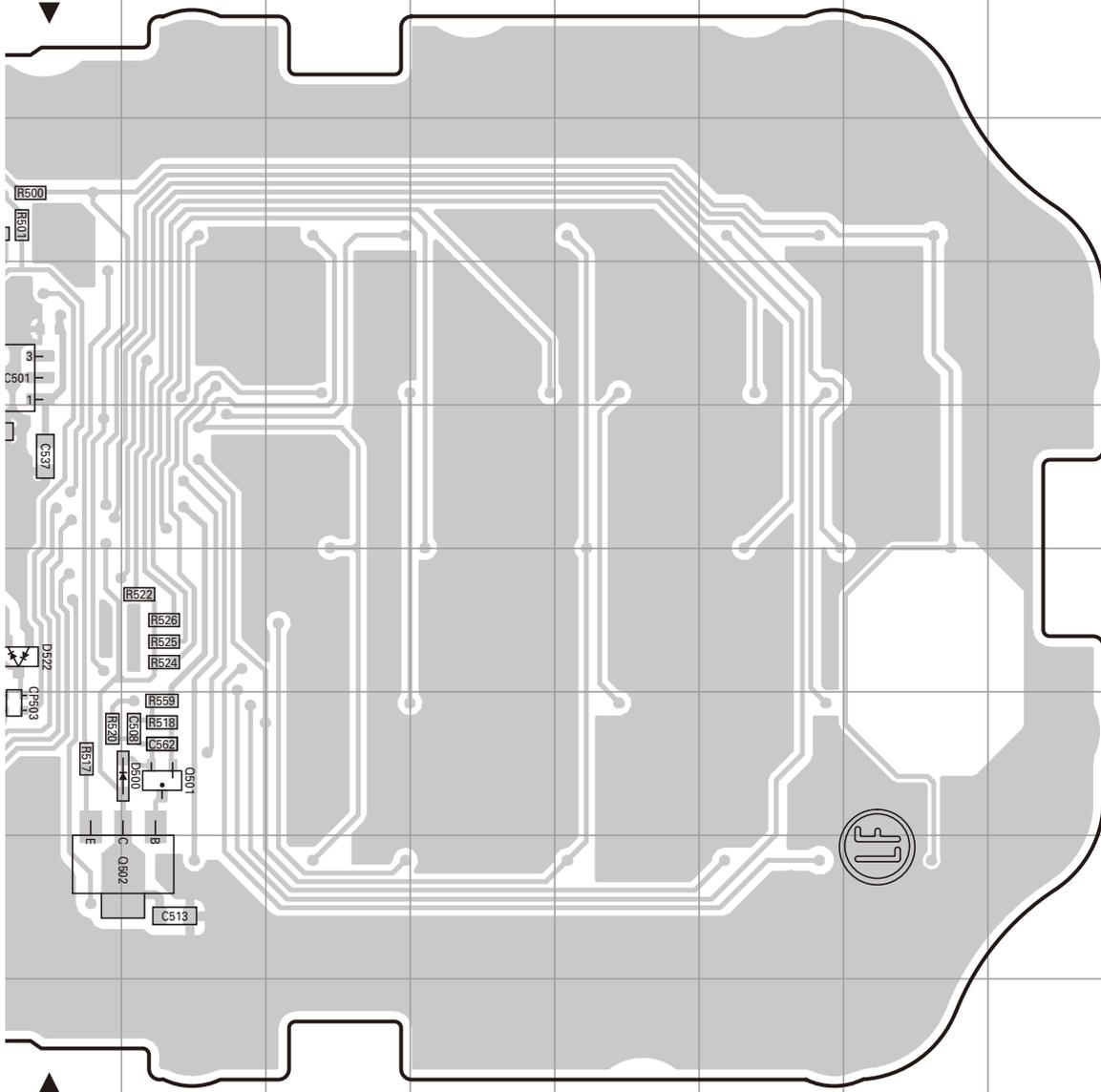


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Ref. No.	Address	Ref. No.	Address
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IC502	7I	Q505	6I
IC503	7I	D500	8K
Q501	8K	D522	7J

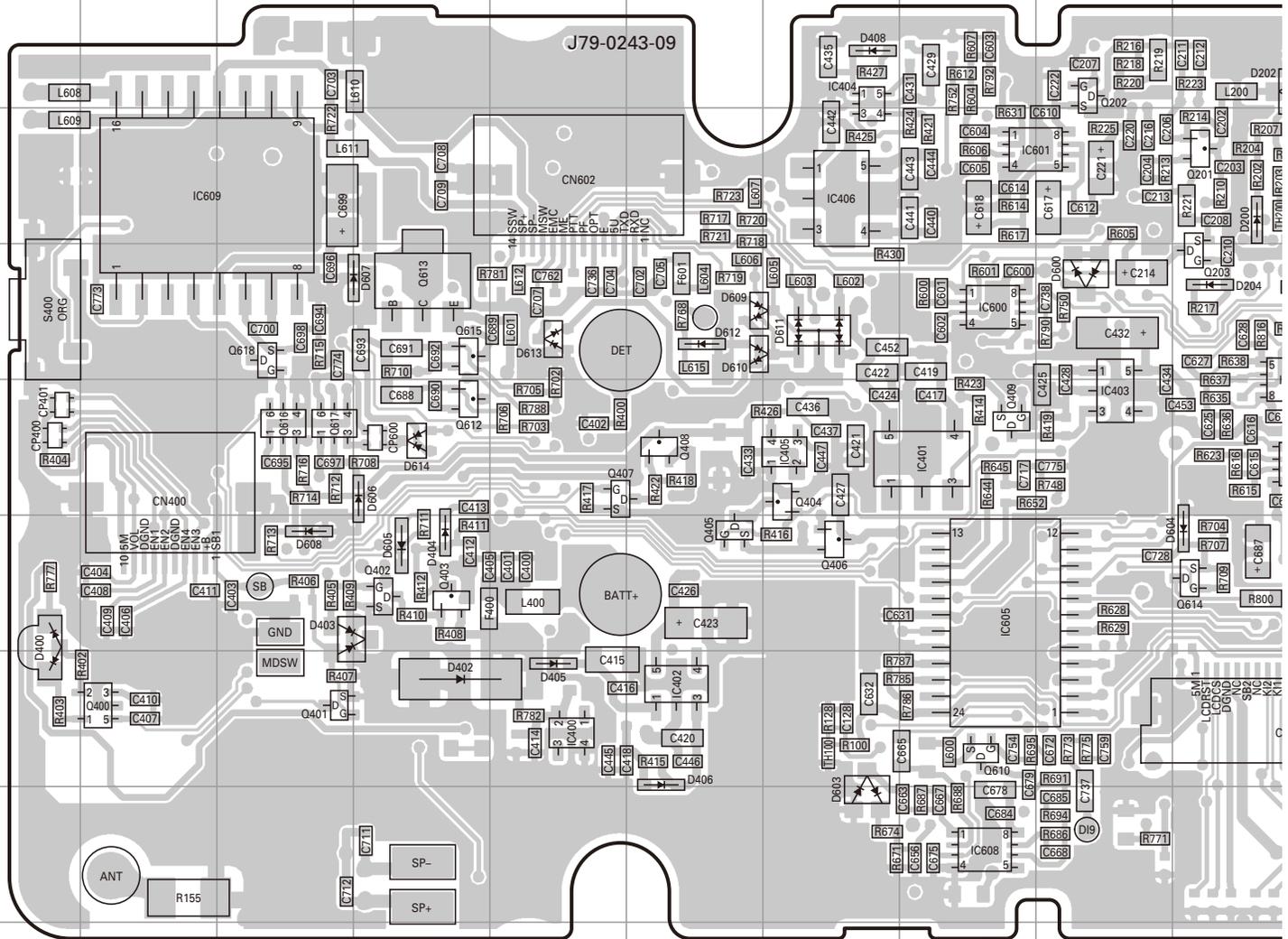
PC BOARD TK-2185

DISPLAY UNIT (X54-3472-72)
Foil side view (J72-0921-39)



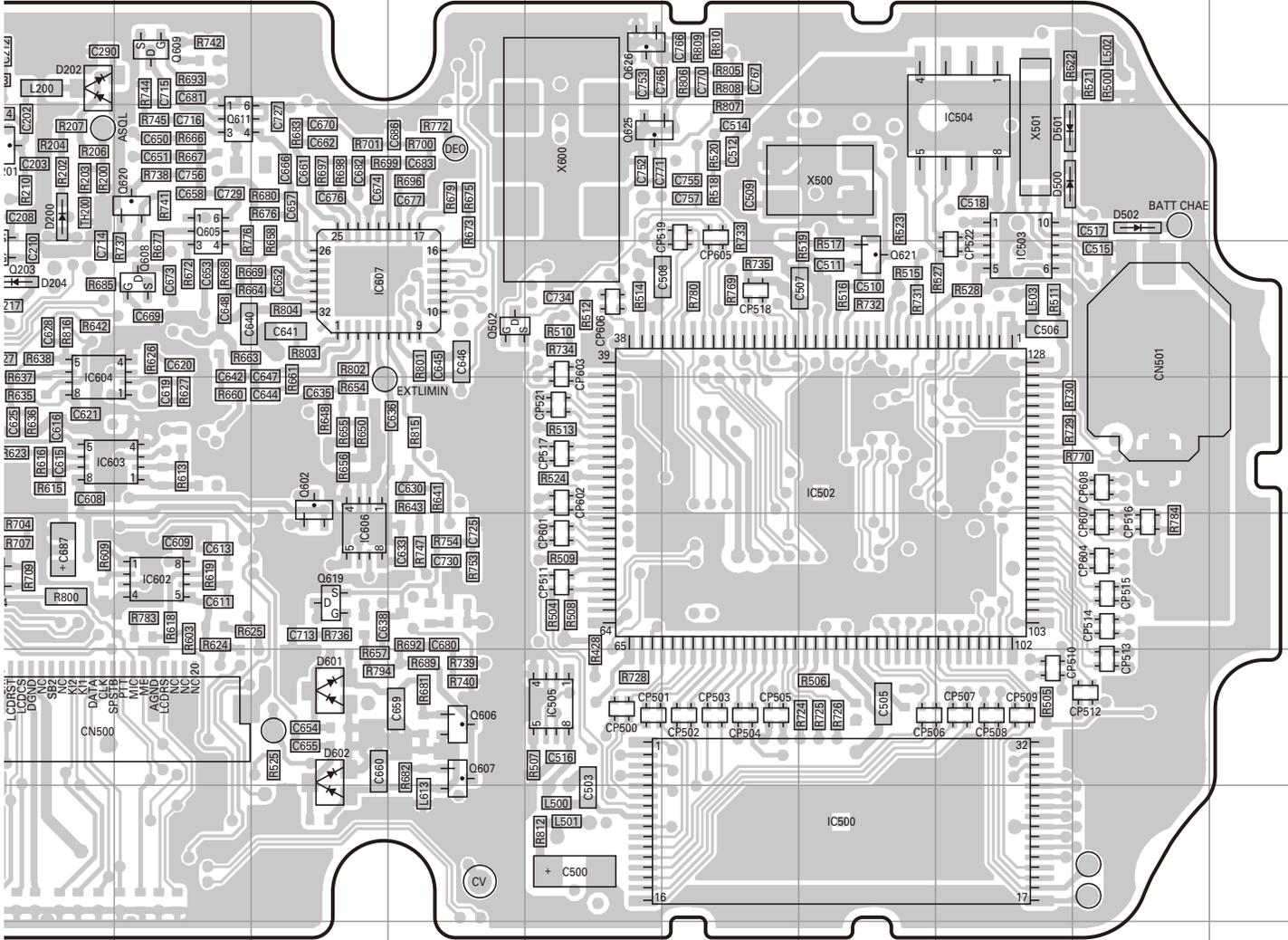
TK-2185 PC BOARD

TX-RX UNIT (X57-6932-72) Component side view (J79-0243-09)

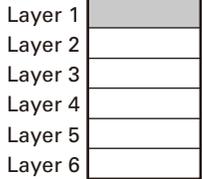


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IC402	8F	IC603	6J	Q403	7D	Q609	3K	Q625	4N	D501	4Q	D611	5G
IC403	6I	IC604	5J	Q404	6G	Q610	8H	Q626	3N	D502	4R	D612	5F
IC404	3G	IC605	7H	Q405	7F	Q611	4K	D200	4J	D600	5I	D613	5E
IC405	6G	IC606	7L	Q406	7G	Q612	6D	D202	3J	D601	8L	D614	6D
IC406	4G	IC607	5L	Q407	6E	Q613	5D	D204	5J	D602	8L		
IC500	9P	IC608	9H	Q408	6F	Q614	7J	D400	7A	D603	9G		
IC502	6P	IC609	4B	Q409	6H	Q615	5D	D402	8D	D604	7J		
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IC504	4Q	Q202	3I	Q602	6L	Q617	6C	D404	7D	D606	6D		
IC505	8N	Q203	5J	Q605	4K	Q618	5C	D405	8E	D607	5D		
IC600	5H	Q400	8B	Q606	8M	Q619	7L	D406	8F	D608	7C		

TX-RX UNIT (X57-6932-72) Component side view (J79-0243-09)



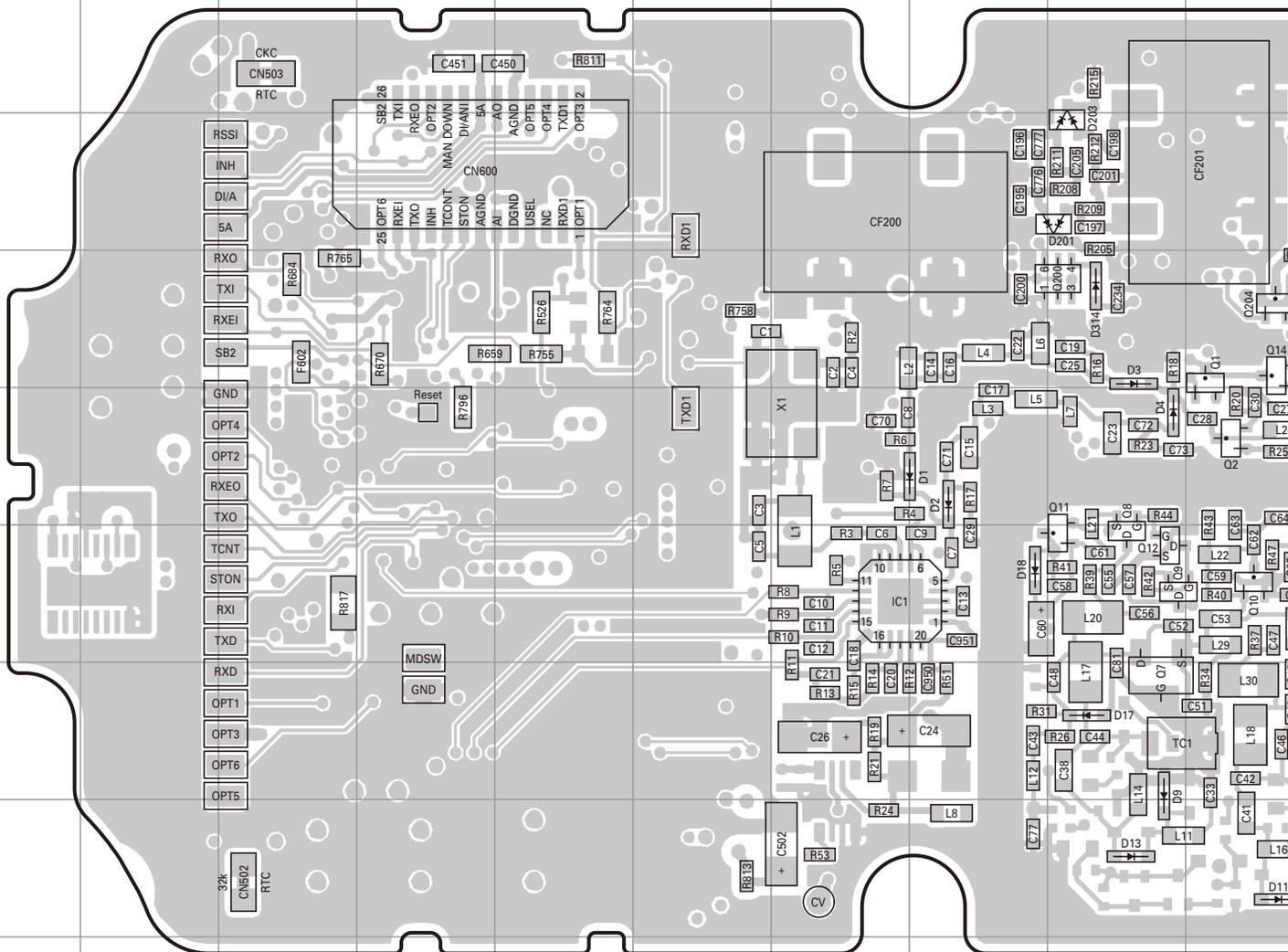
Component side



Foil side

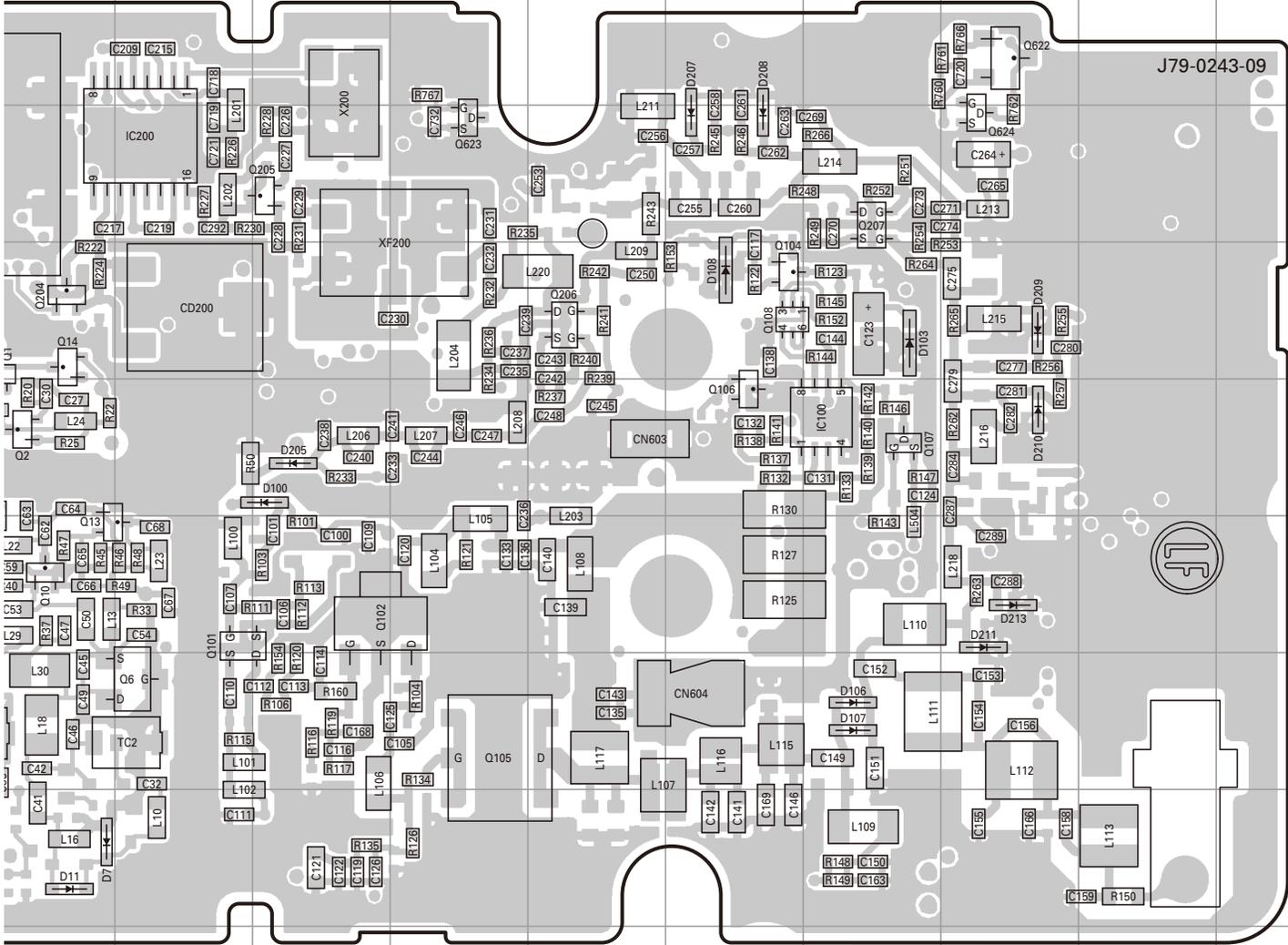
TK-2185 PC BOARD

TX-RX UNIT (X57-6932-72) Foil side view (J79-0243-09)

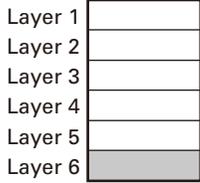


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IC200	4K	Q13	7J	Q204	5J	D4	6I	D107	8P	D213	7Q
Q1	5J	Q14	5J	Q205	4L	D7	9J	D108	5O	D314	5I
Q2	6J	Q101	7K	Q206	5N	D9	8I	D201	4I		
Q6	8K	Q102	7L	Q207	4P	D11	9J	D203	4I		
Q7	8I	Q104	5O	Q622	3Q	D13	9I	D205	6L		
Q8	7I	Q105	8M	Q623	4M	D17	8I	D207	4O		
Q9	7I	Q106	6O	Q624	4Q	D18	7H	D208	4O		
Q10	7J	Q107	6P	D1	6H	D100	6L	D209	5Q		

TX-RX UNIT (X57-6932-72) Foil side view (J79-0243-09)



Component side

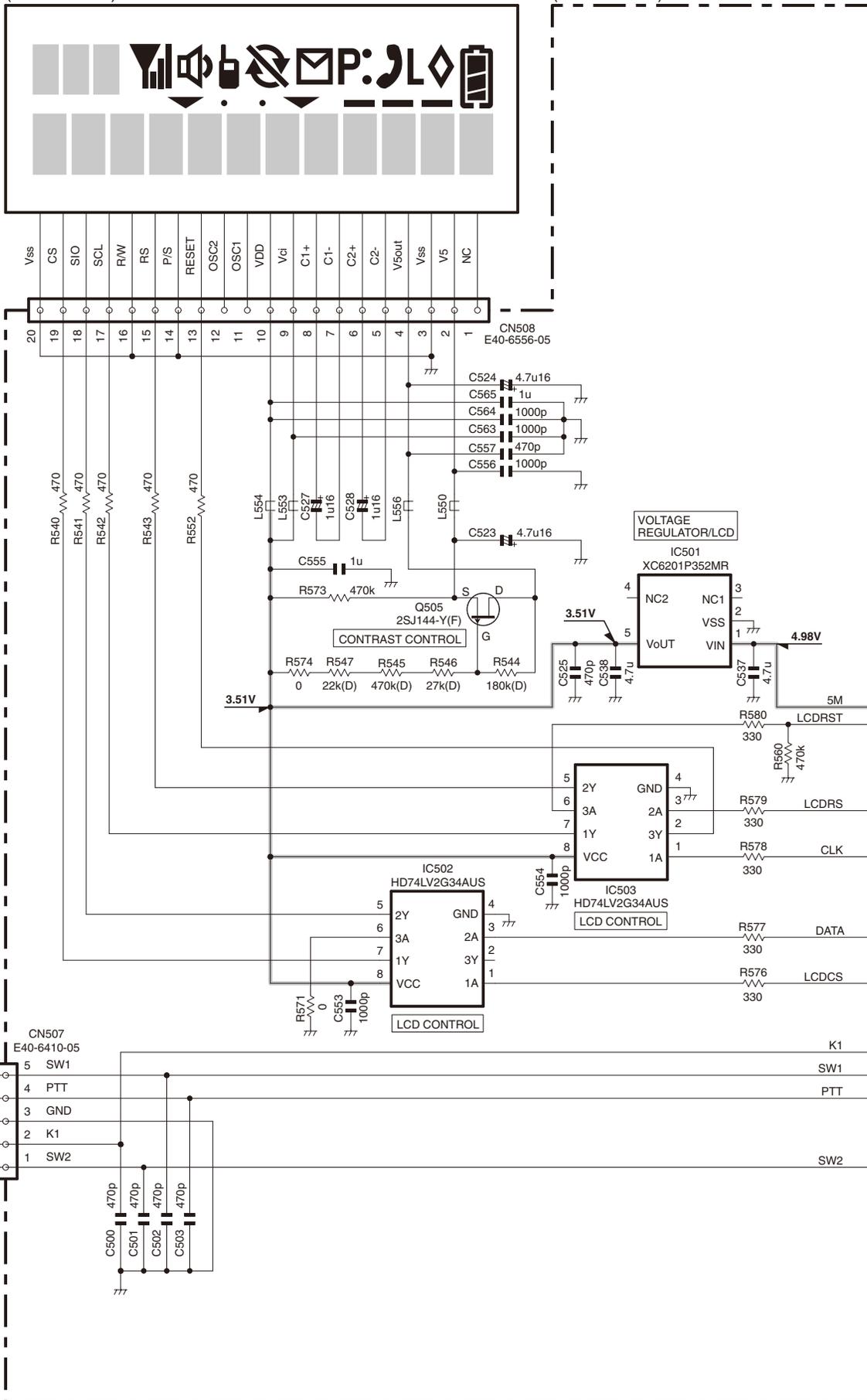


Foil side

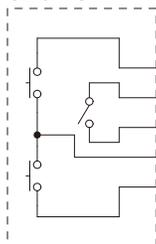
TK-2185 SCHEMATIC DIAGRAM

LCD ASSY
(B38-0900-35)

DISPLAY UNIT
(X54-3472-72)

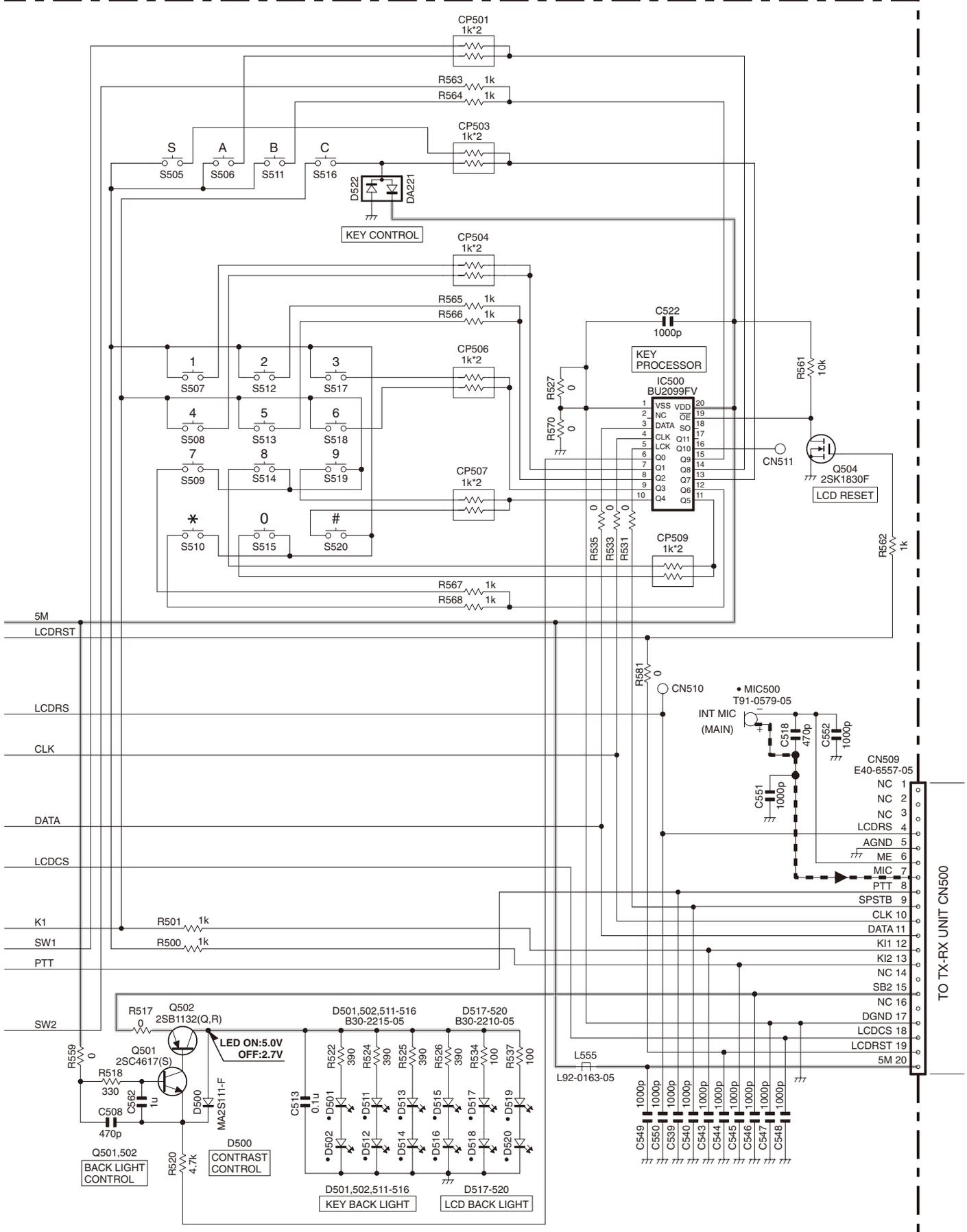


SIDE KEY SECTION



SCHEMATIC DIAGRAM TK-2185

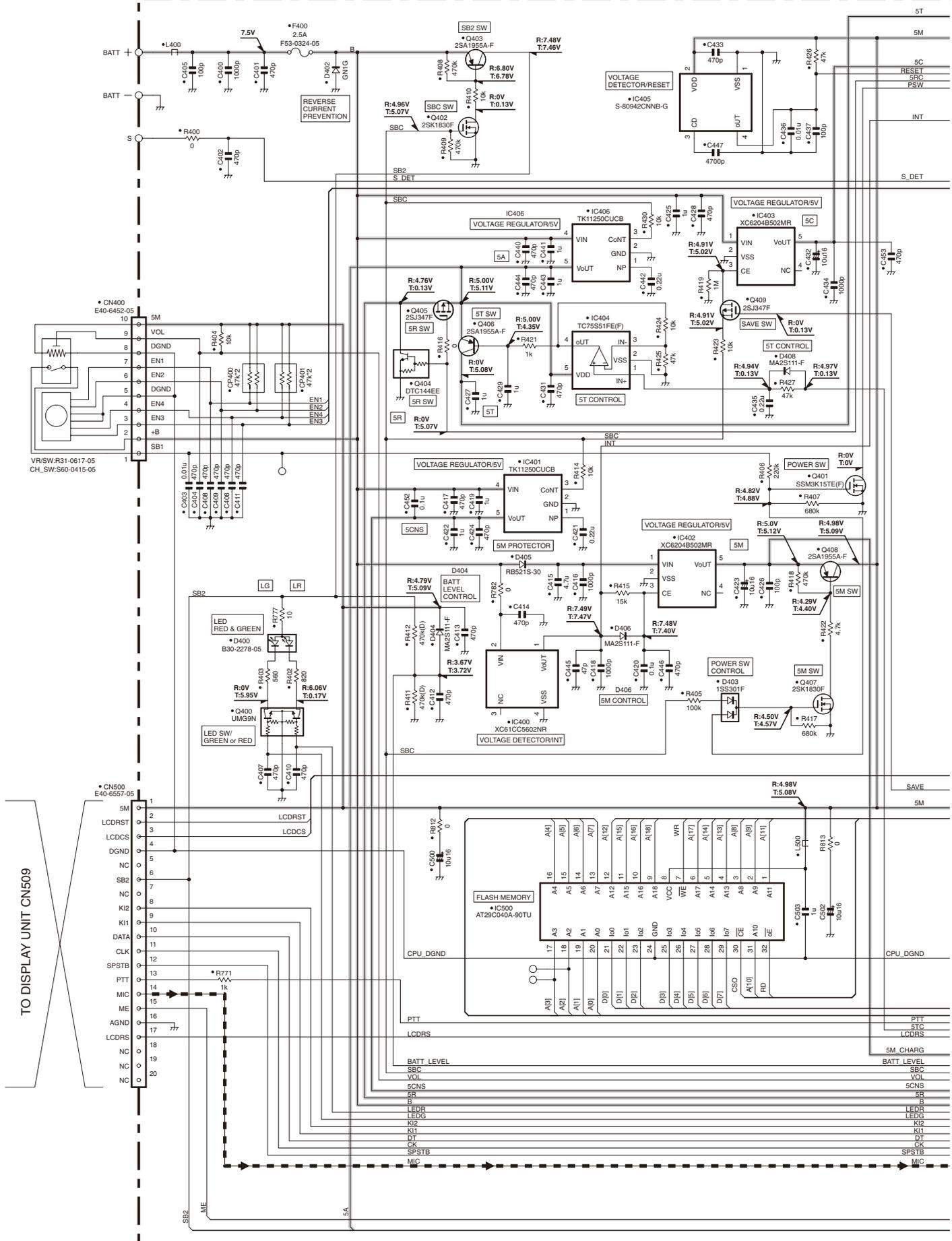
DISPLAY UNIT (X54-3472-72)



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

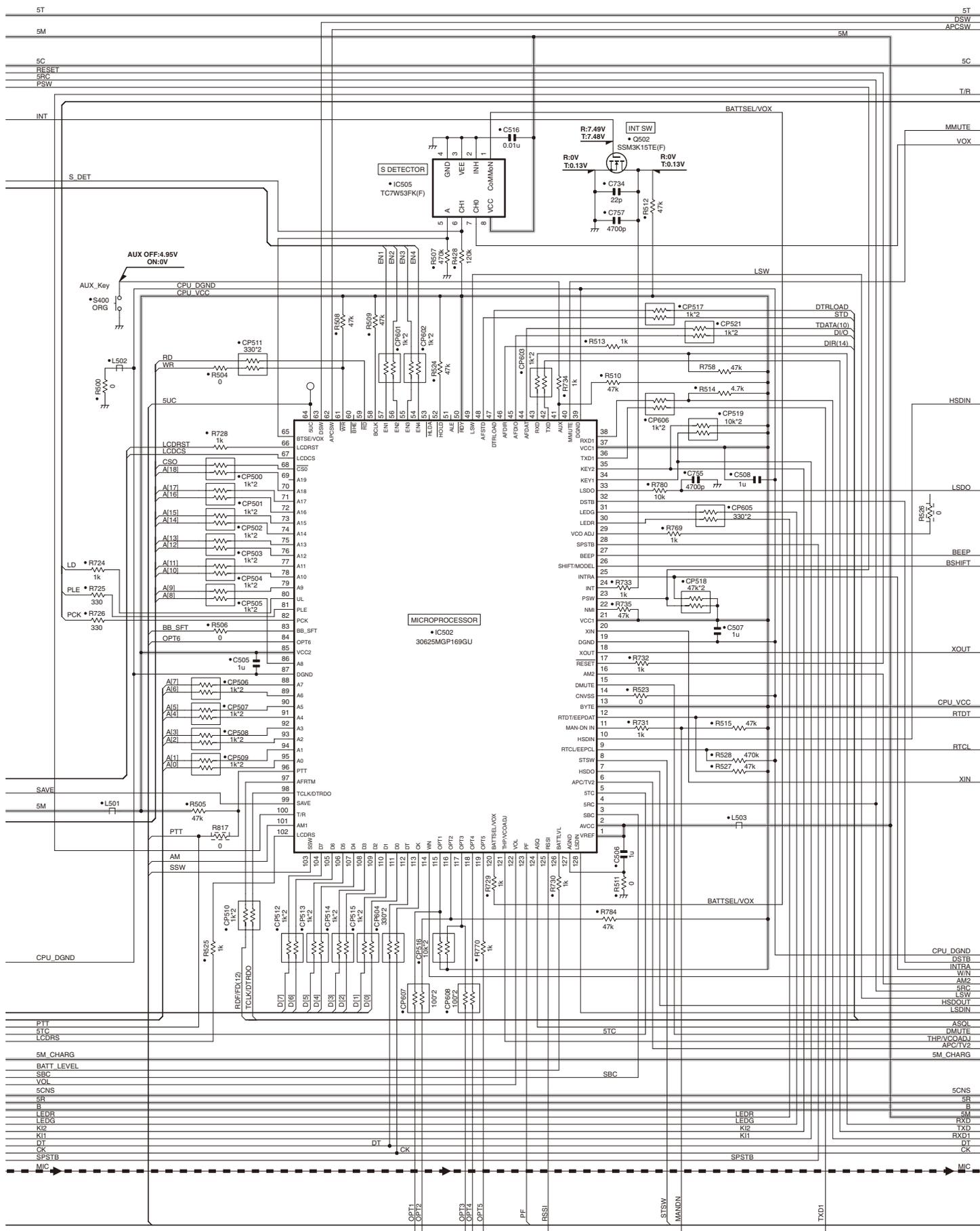
TK-2185 SCHEMATIC DIAGRAM

TX-RX UNIT(X57-6932-72)



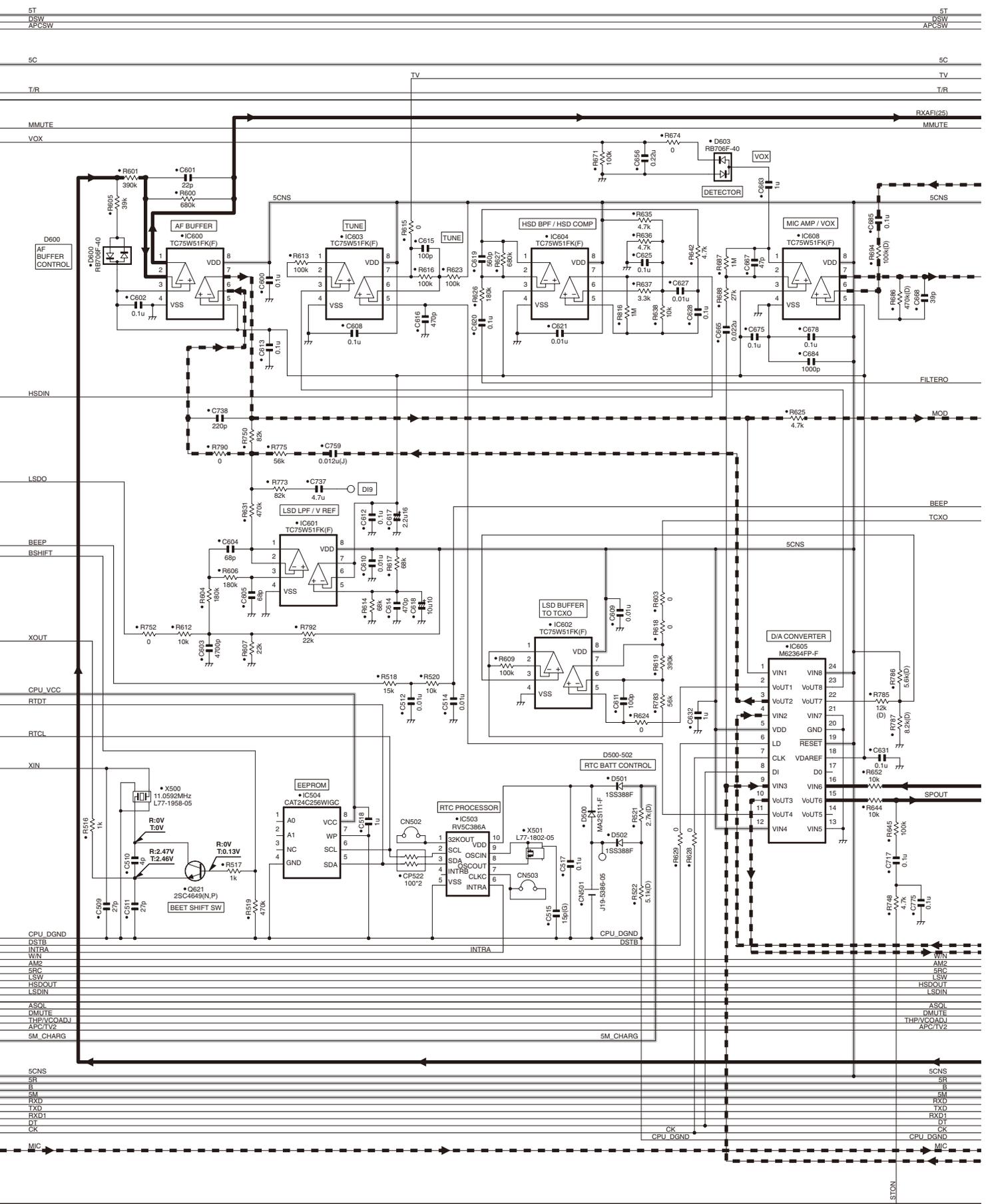
SCHEMATIC DIAGRAM TK-2185

TX-RX UNIT (X57-6932-72)



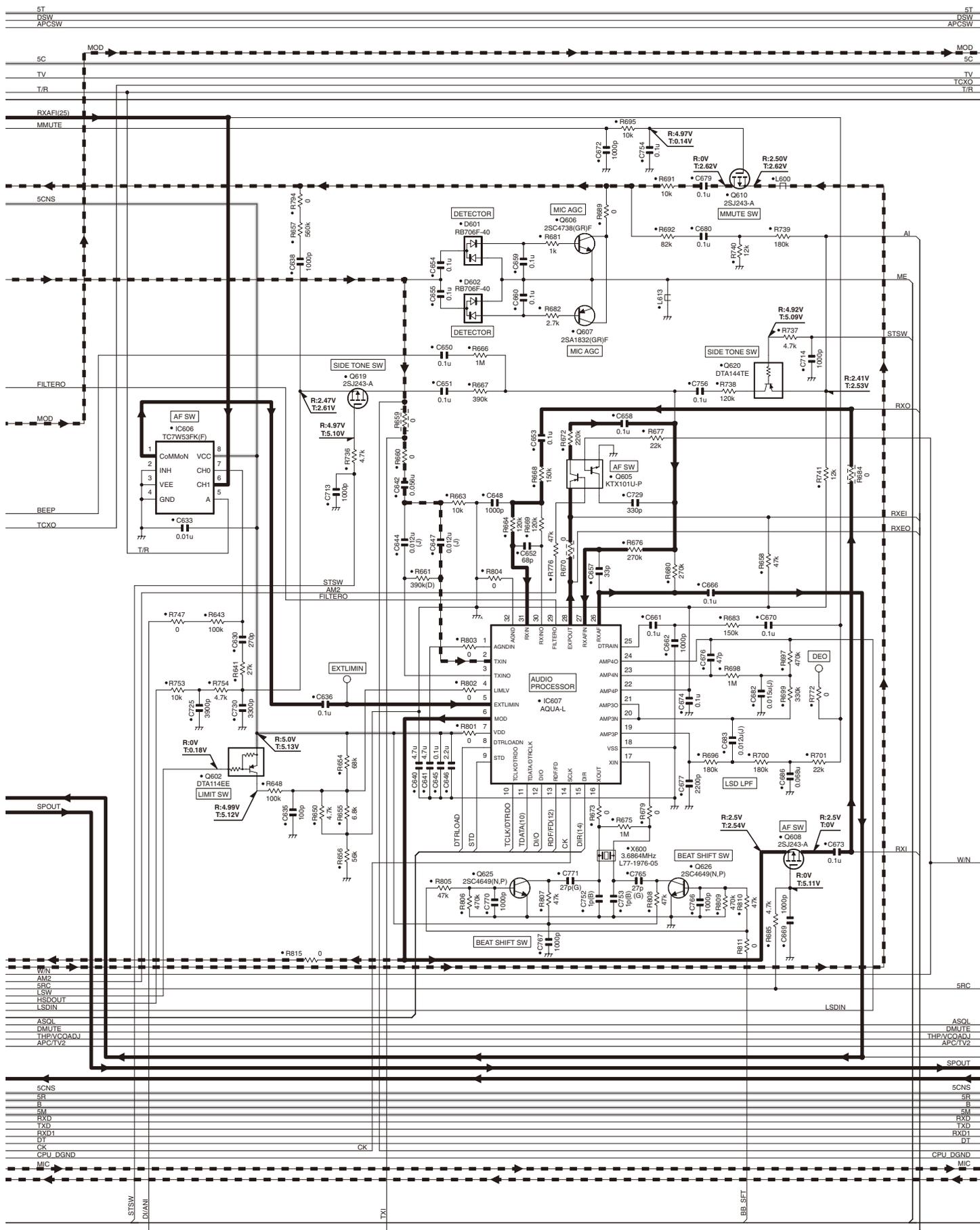
TK-2185 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-6932-72)



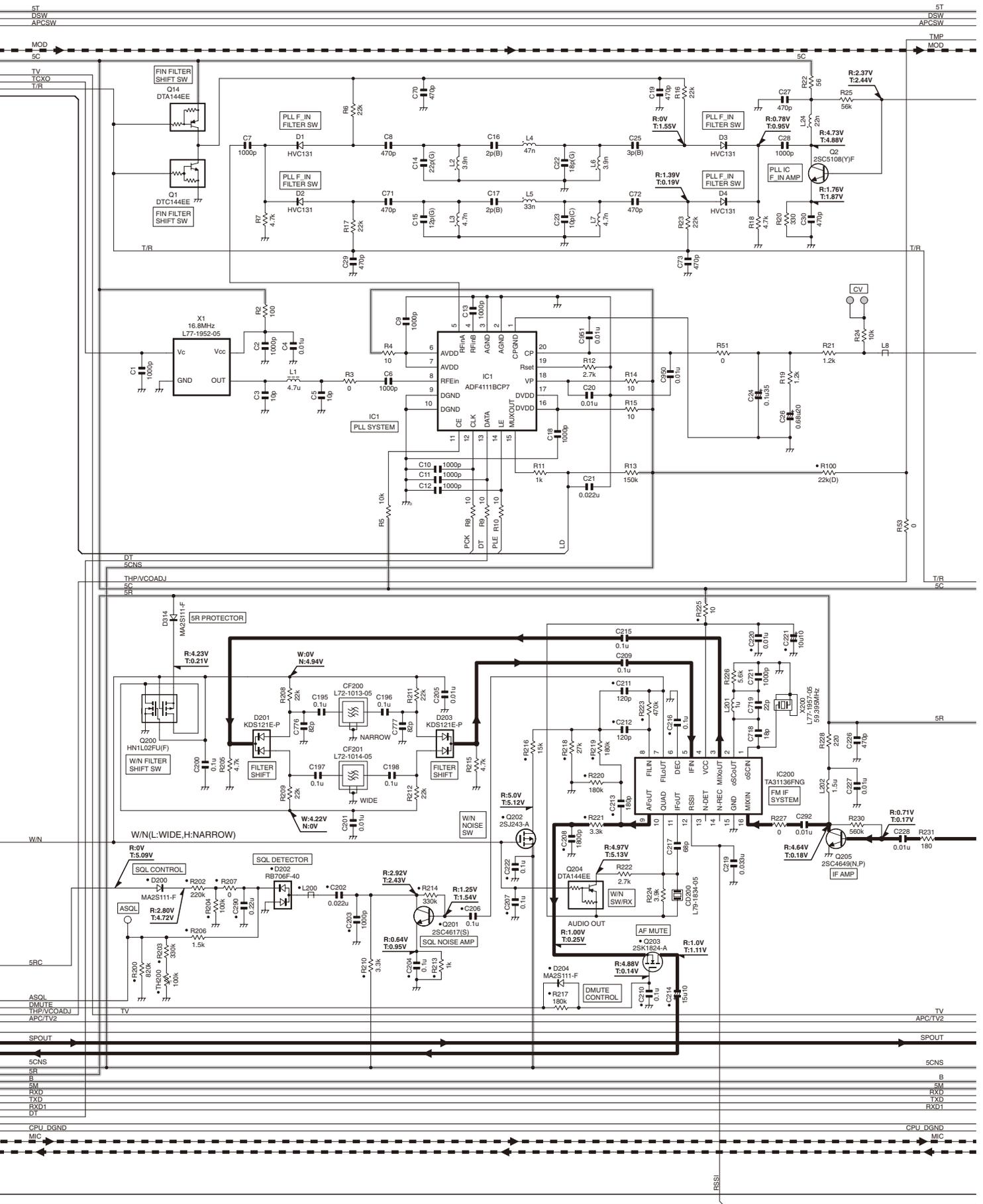
SCHEMATIC DIAGRAM TK-2185

TX-RX UNIT (X57-6932-72)



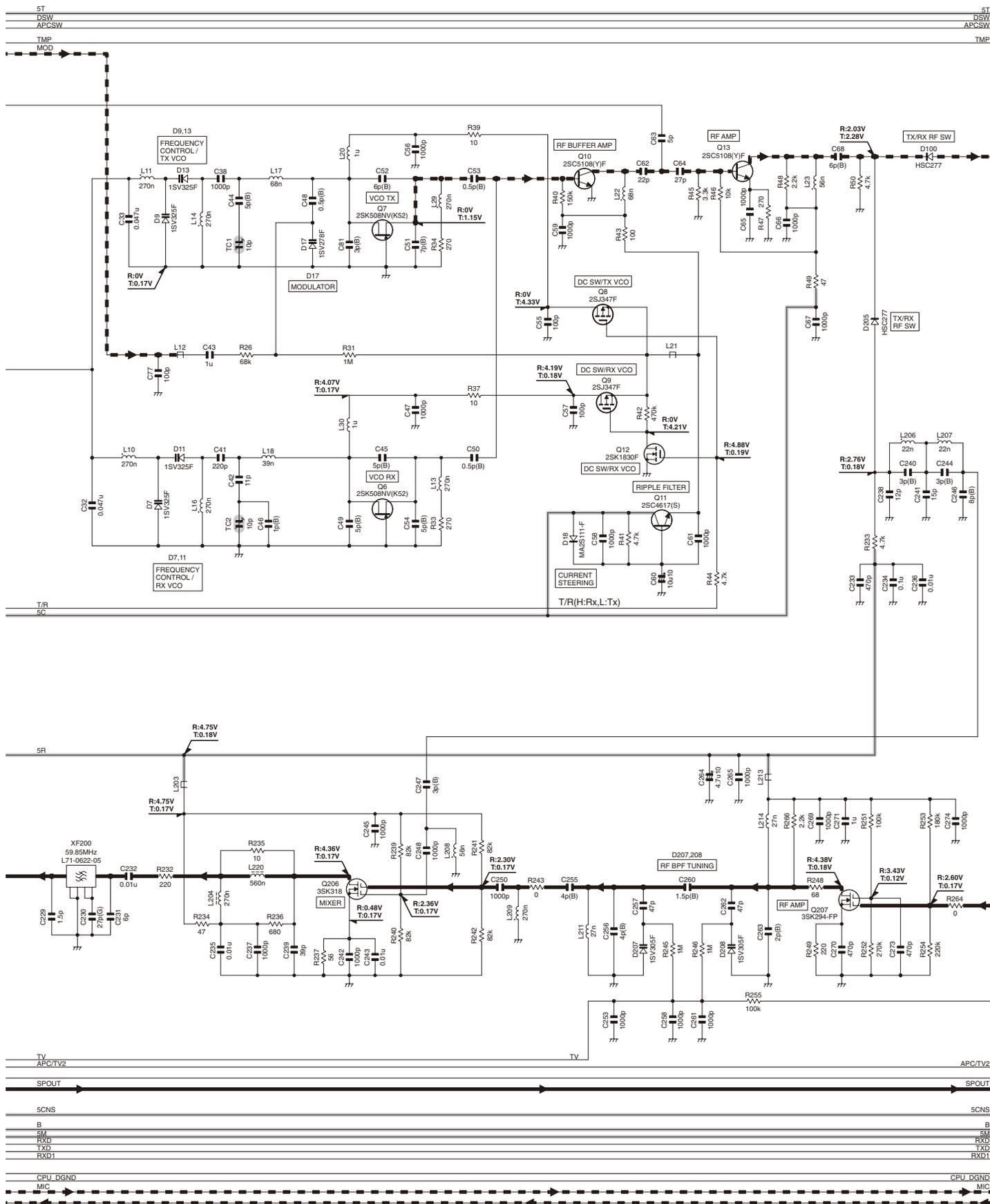
TK-2185 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-6932-72)



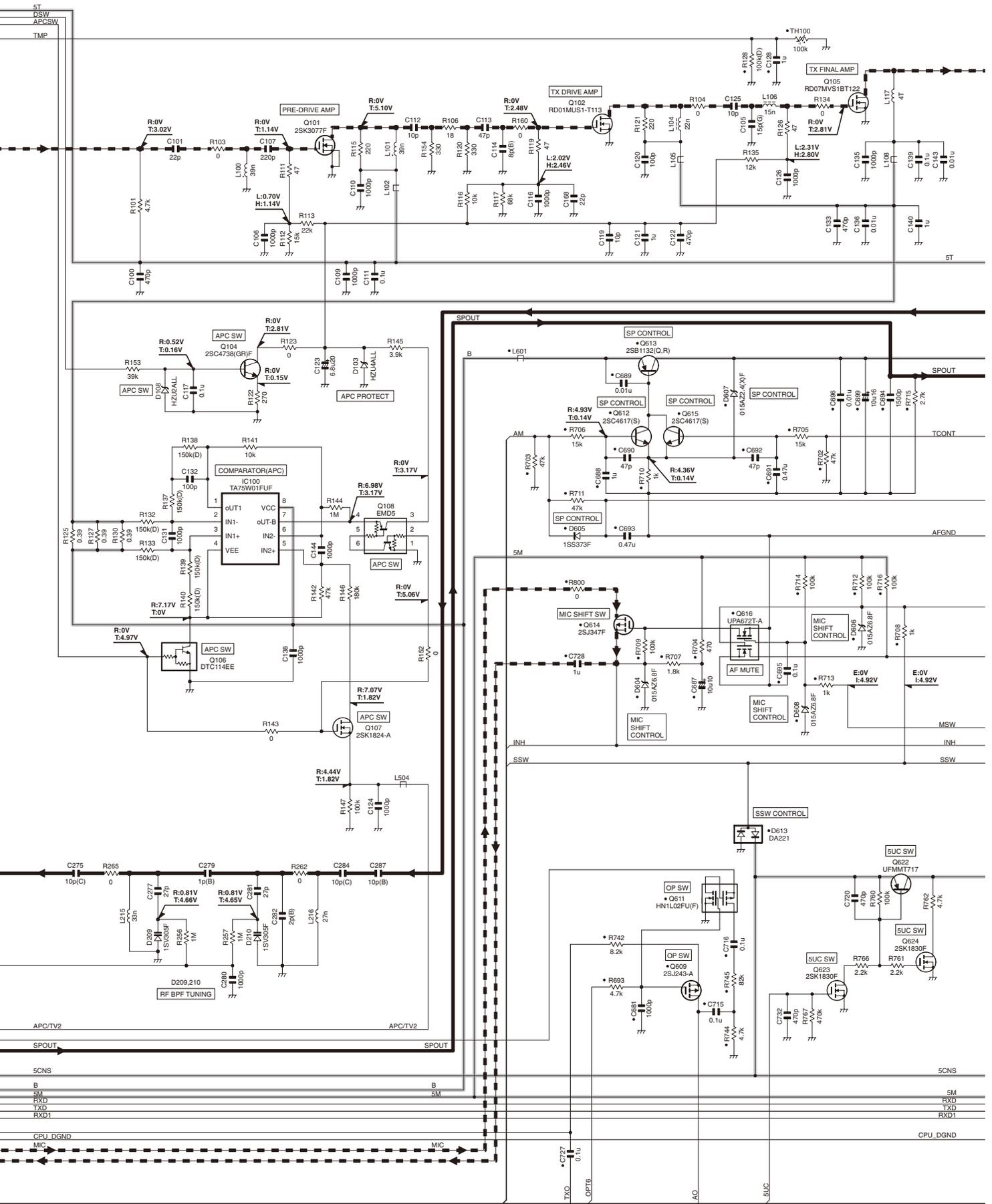
SCHEMATIC DIAGRAM TK-2185

TX-RX UNIT (X57-6932-72)



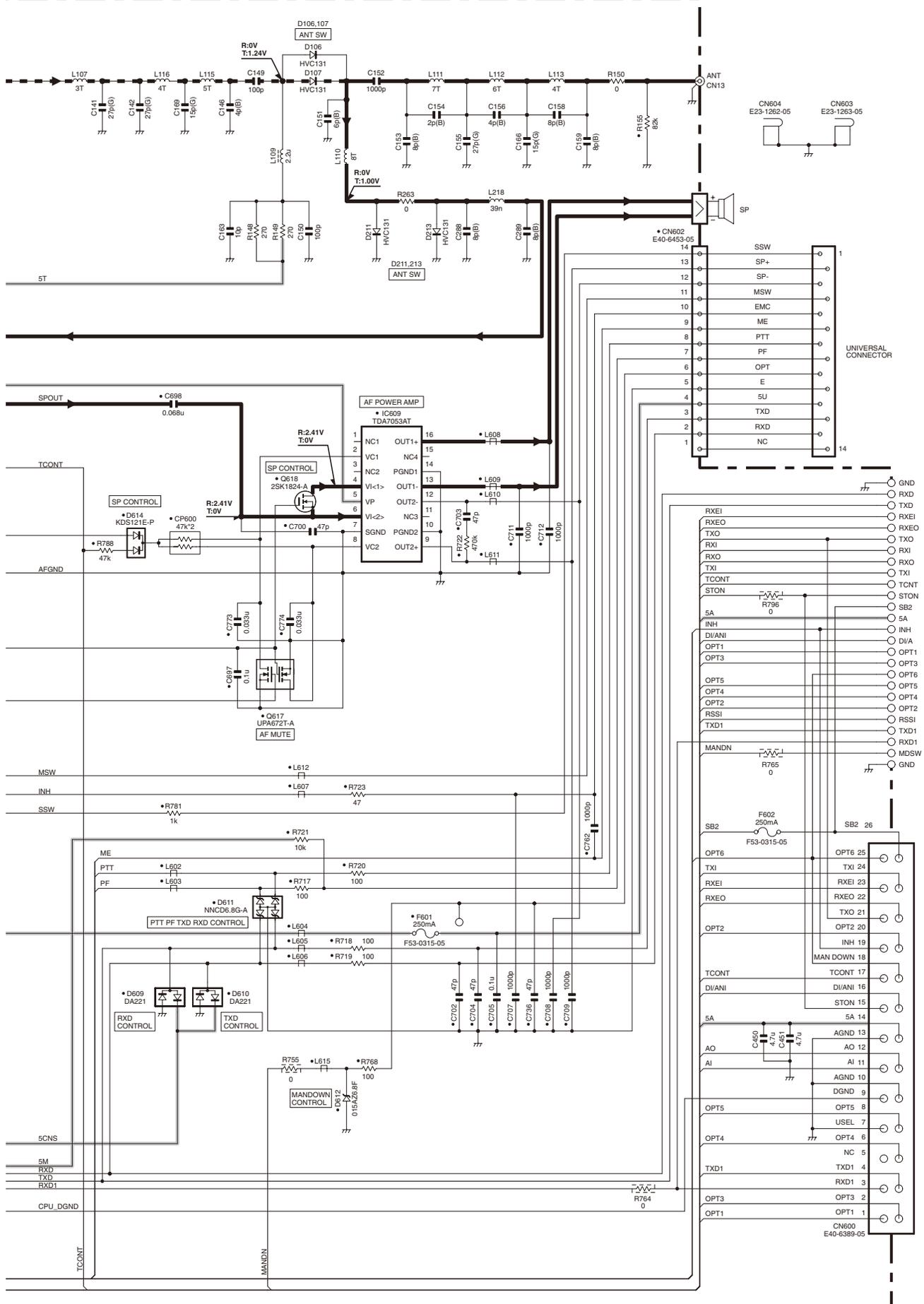
TK-2185 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-6932-72)



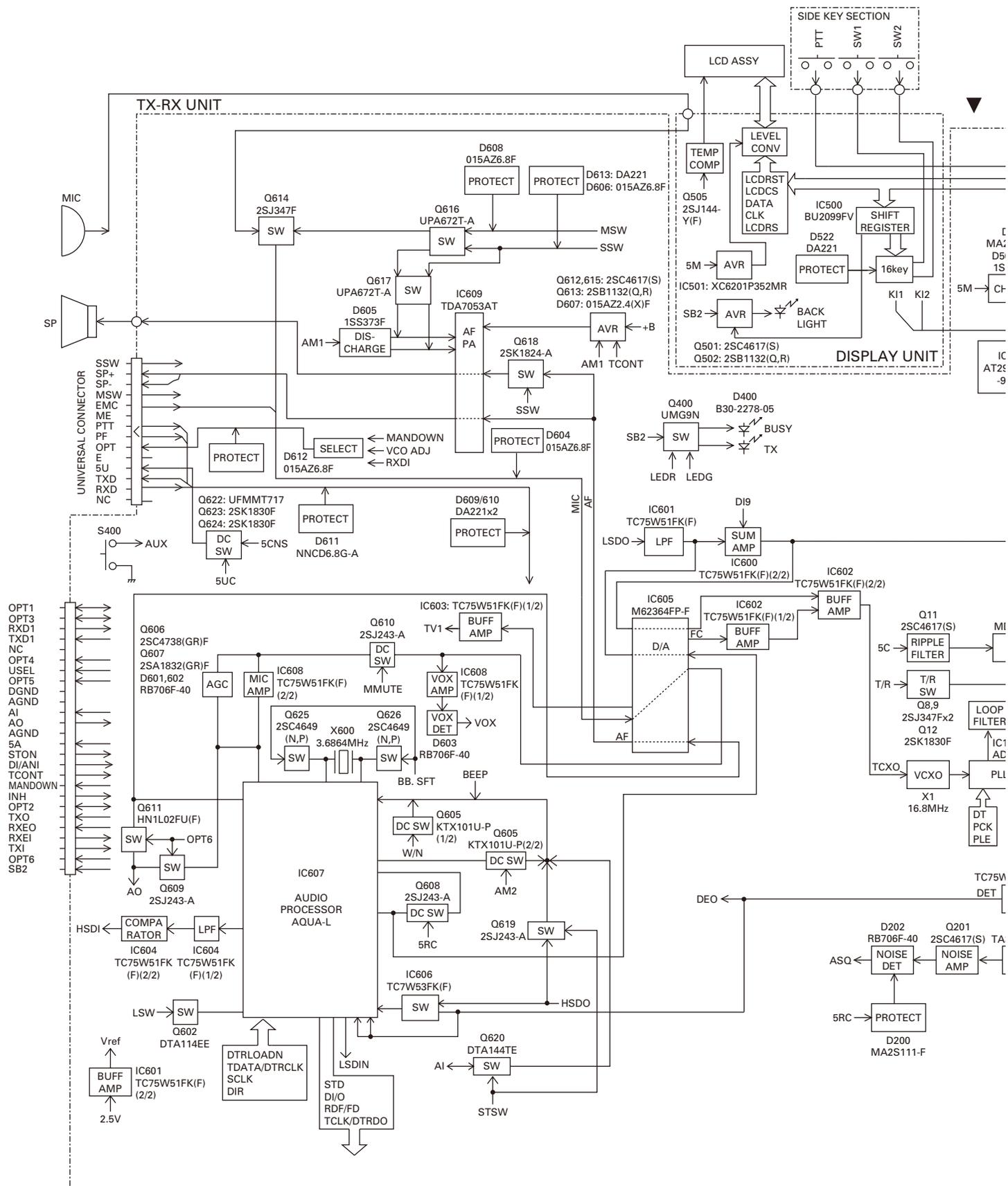
SCHEMATIC DIAGRAM TK-2185

TX-RX UNIT (X57-6932-72)

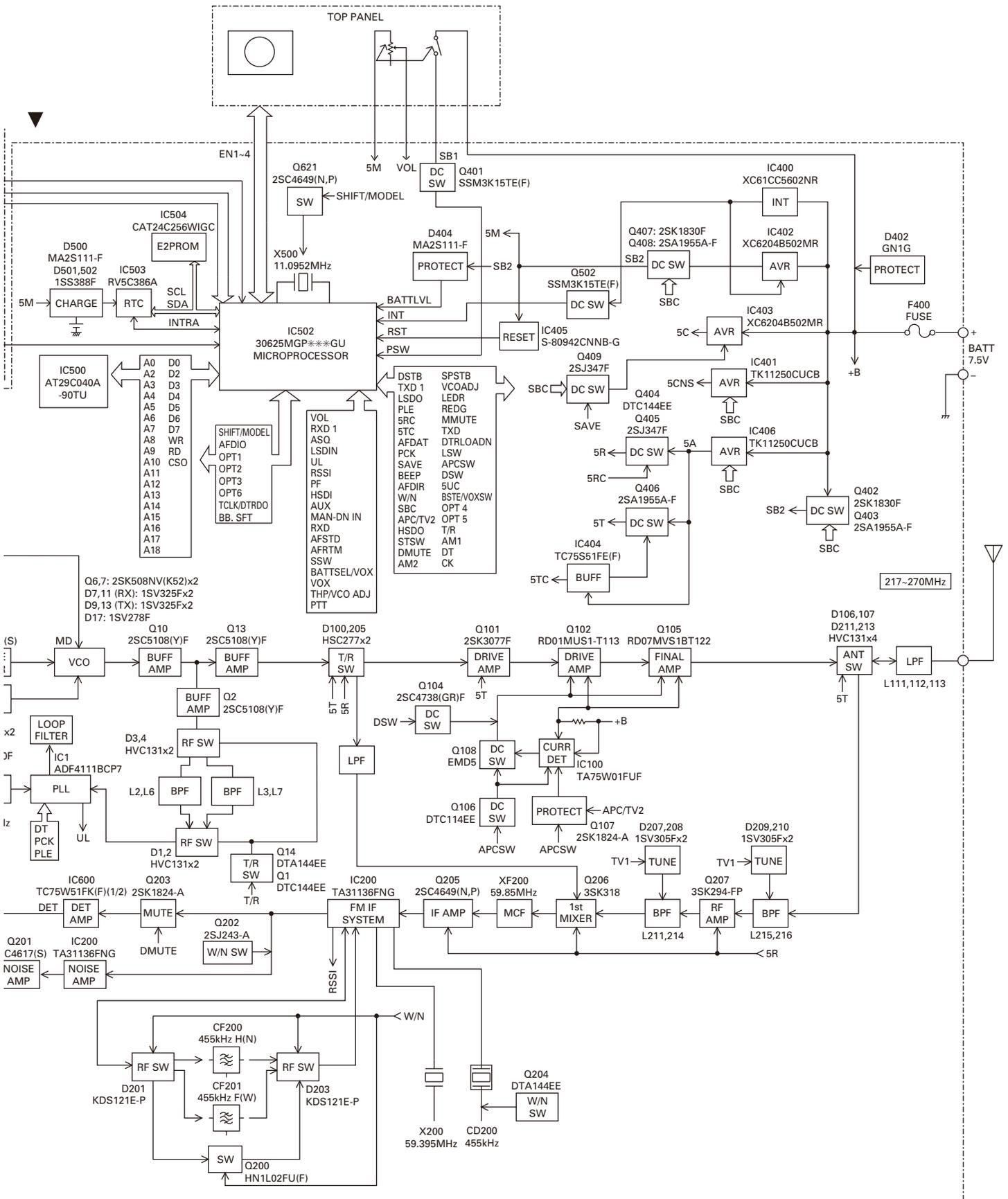


Note : The components marked with a dot (•) are parts of layer 1.

BLOCK DIAGRAM

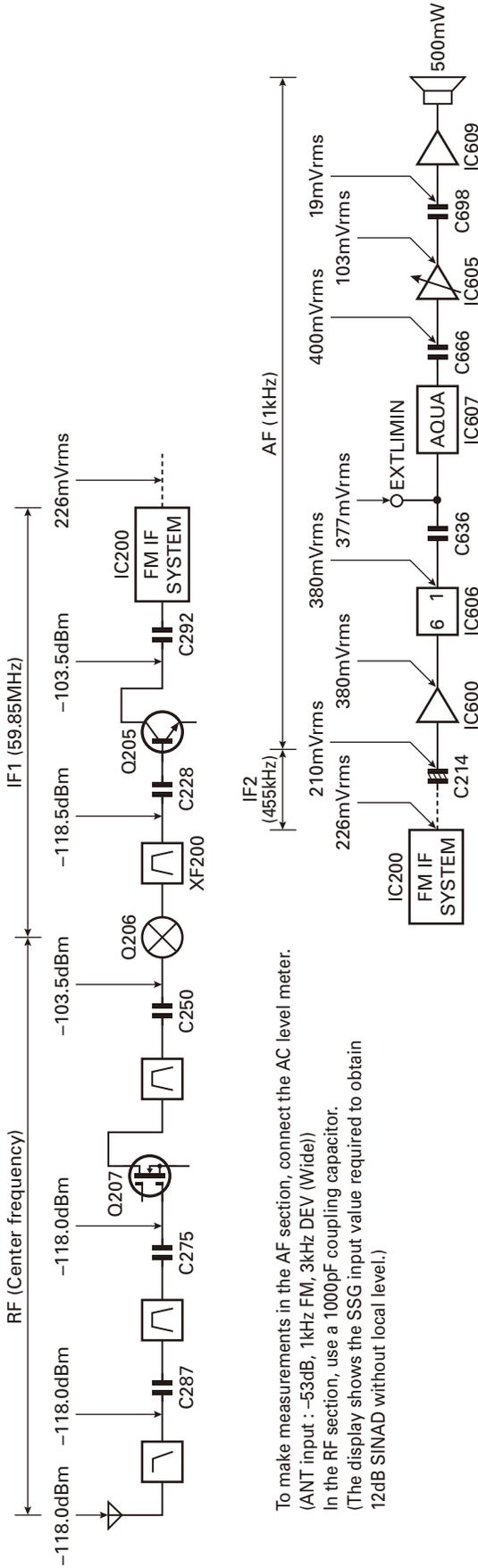


BLOCK DIAGRAM



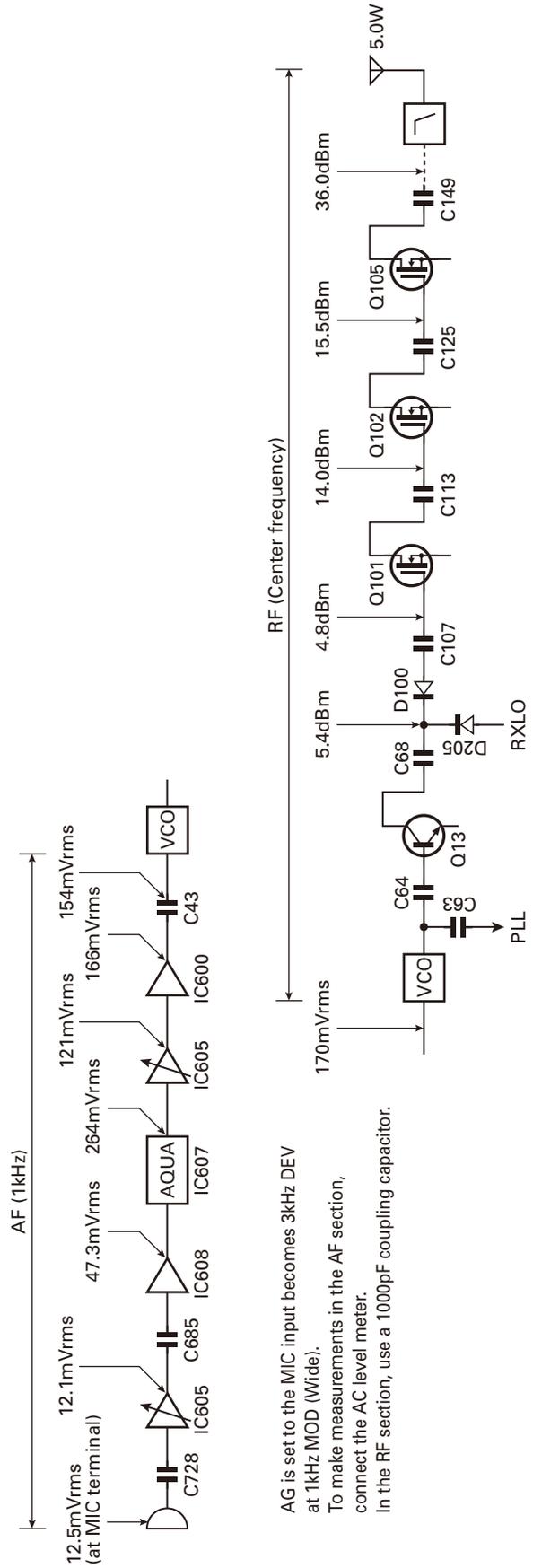
LEVEL DIAGRAM

Receiver Section



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

Transmitter Section



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

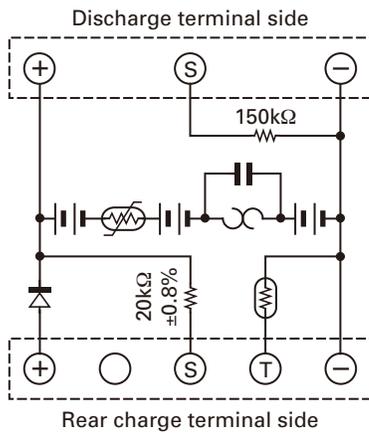
OPTIONAL ACCESSORIES

KNB-32N (Ni-MH Battery Pack) : 7.2V 2500mAh

■ External View



■ Schematic Diagram

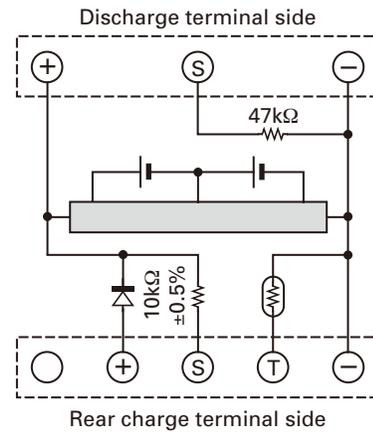


KNB-33L (Li-ion Battery Pack) : 7.4V 2000mAh

■ External View



■ Schematic Diagram



KSC-32 (Rapid Charger)

■ External View



SPECIFICATIONS

GENERAL

Frequency range.....	217~270MHz
Number of channels/Call address	
Conv. mode.....	Max. 32 per personal
Trunked network.....	Max. 99 per personal
Channel spacing.....	Wide : 25kHz Narrow : 12.5kHz
Operating voltage.....	7.5V DC \pm 20%
Battery life (5-5-90 duty cycle, during hi-power)	
with KNB-32N (2500mAh).....	Approx. 14 hours
with KNB-33L (2000mAh).....	Approx. 10 hours
Operating temperature range.....	-30°C~+60°C (-10°C~+60°C when KNB-32N or KNB-33L in use.)
Frequency stability.....	\pm 2.5ppm (-30°C~+60°C)
Antenna impedance.....	50 Ω
Channel frequency spread.....	53MHz
Dimensions (W x H x D Projections not included).....	58 x 136 x 33 mm with KNB-33L battery 58 x 136 x 39.5 mm with KNB-32N battery
Weight (net).....	400 g with battery (KNB-33L), antenna (KRA-34) and belt clip (KBH-11)

RECEIVER (Measurements made per EN standard)

Sensitivity

EIA 12dB SINAD.....	Wide : 0.28 μ V Narrow : 0.32 μ V
EN 20dB SINAD.....	Wide : -3dB μ V (0.35 μ V) Narrow : -2dB μ V (0.40 μ V)
Adjacent channel selectivity.....	Wide : 73dB Narrow : 63dB
Intermodulation.....	65dB
Spurious response rejection.....	70dB
Audio output.....	500mW/8 Ω

TRANSMITTER (Measurements made per EN standard)

RF power output.....	High : 5W Low : 1W
Modulation limiting.....	Wide : \pm 5.0kHz at 25kHz Narrow : \pm 2.5kHz at 12.5kHz
Spurious emission.....	-36dBm \leq 1GHz, -30dBm $>$ 1GHz
FM noise (EIA).....	Wide : 45dB Narrow : 40dB
Modulation distortion.....	Less than 3%
Microphone impedance.....	2k Ω

Kenwood Corporation

2967-3, Ishikawa-machi, Hachioji-shi, Tokyo, 192-8525 Japan

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Kenwood Electronics Deutschland GmbH

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Kenwood Electronics Belgium N.V.

Leuvensesteenweg 248 J, 1800 Vilvoorde, Belgium

Kenwood Electronics France S.A.L'Etoile Paris Nord 2, 50 Allée des Impressionnistes,
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Bolivia, 239-08020 Barcelona, Spain

Kenwood Electronics Australia Pty. Ltd.

(A.C.N. 001 499 074)

16 Giffnock Avenue, Centrecourt Estate, North Ryde, N.S.W. 2113 Australia

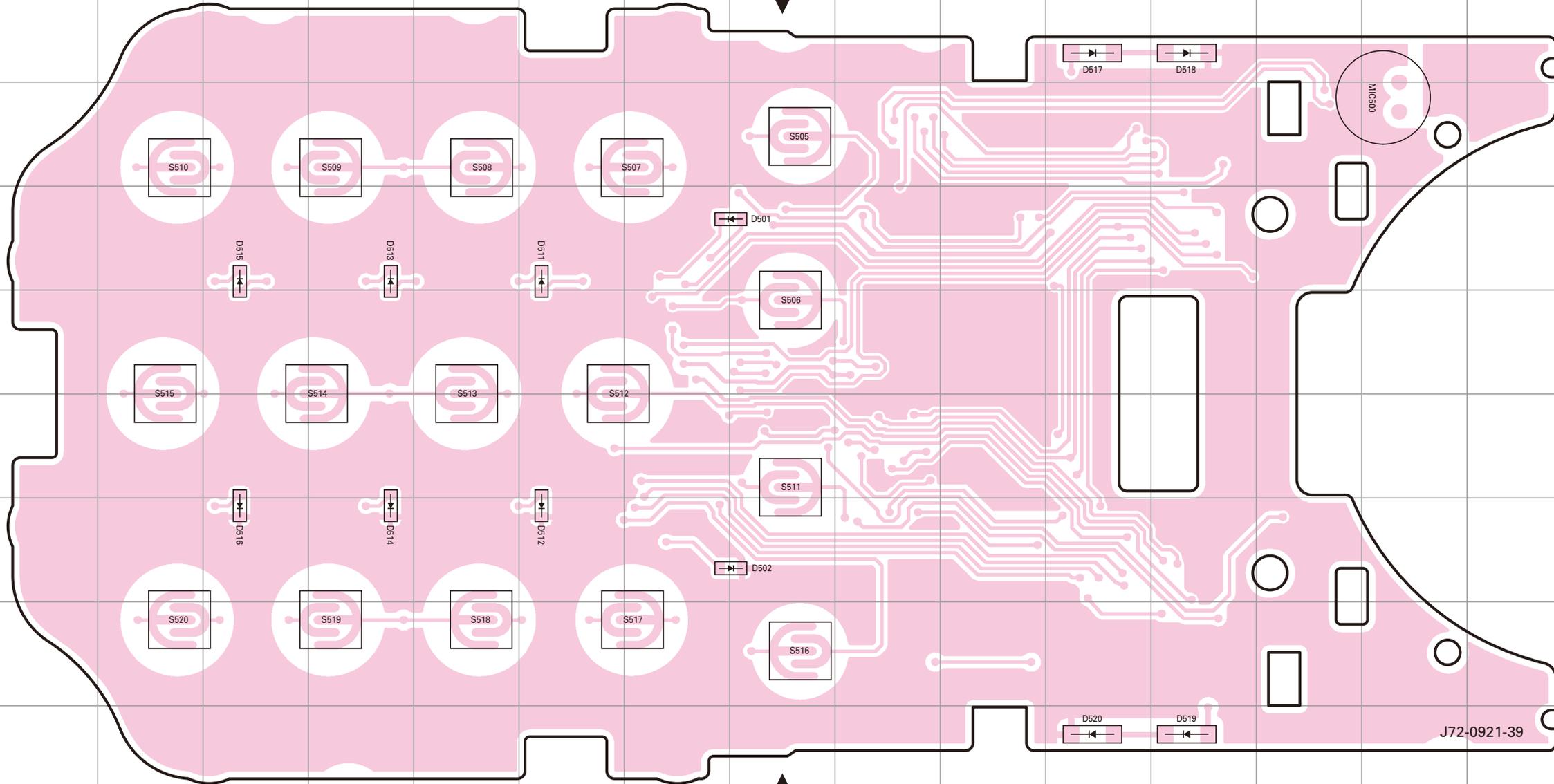
Kenwood Electronics (Hong Kong) Ltd.Unit 3712-3724, Level 37, Tower one Metroplaza, 223 Hing Fong Road,
Kwai Fong, N.T., Hong Kong**Kenwood Electronics Singapore Pte Ltd**

1 Ang Mo Kio Street 63, Singapore 569110

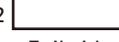


DISPLAY UNIT (X54-3472-72)
Component side view (J72-0921-39)

DISPLAY UNIT (X54-3472-72)
Component side view (J72-0921-39)



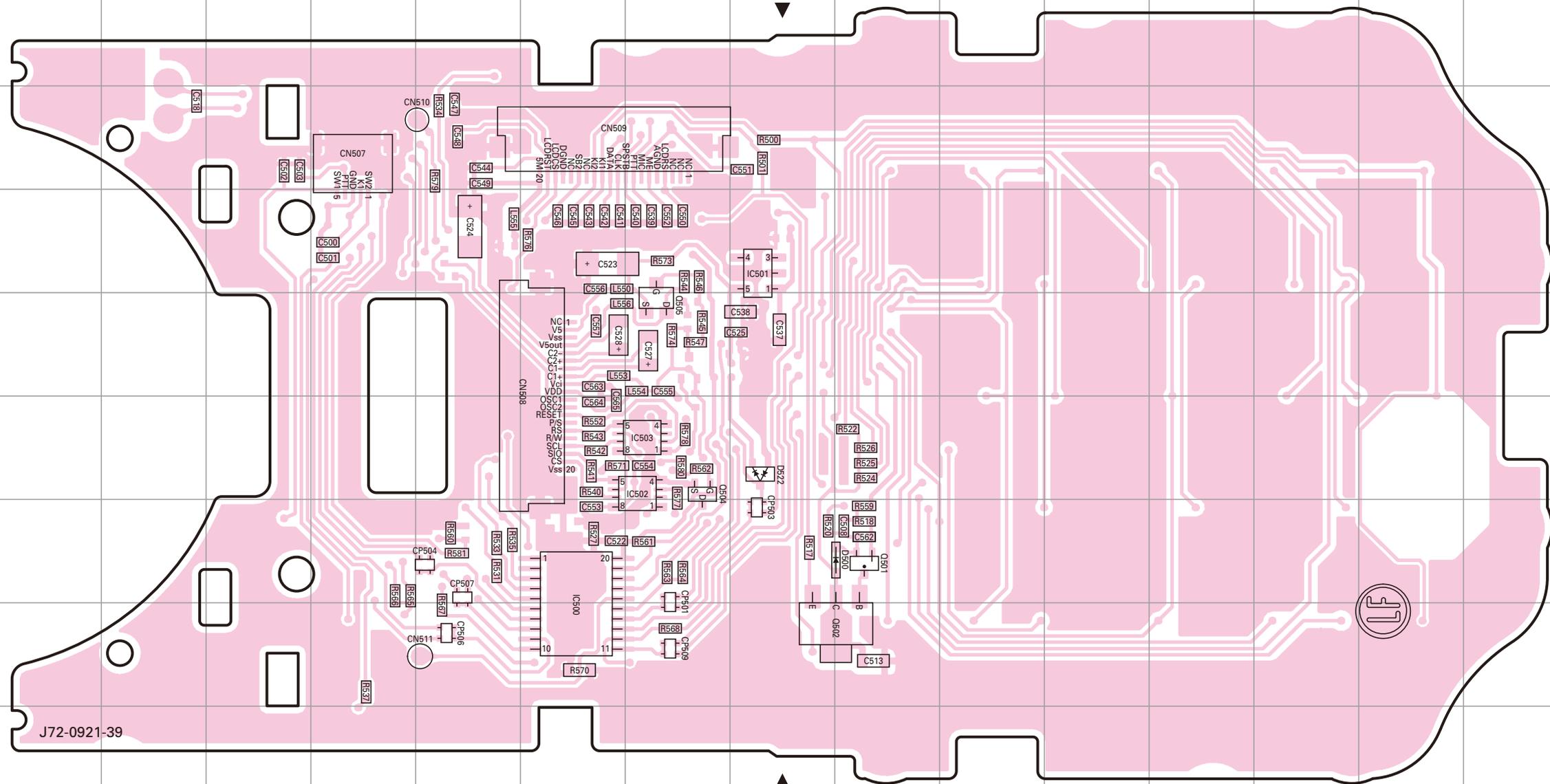
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D512	8H	D518	3N
D513	5F	D519	10N
D514	8F	D520	10M

Component side
 Layer 1 
 Layer 2 
 Foil side

J72-0921-39

DISPLAY UNIT (X54-3472-72)
Foil side view (J72-0921-39)

DISPLAY UNIT (X54-3472-72)
Foil side view (J72-0921-39)

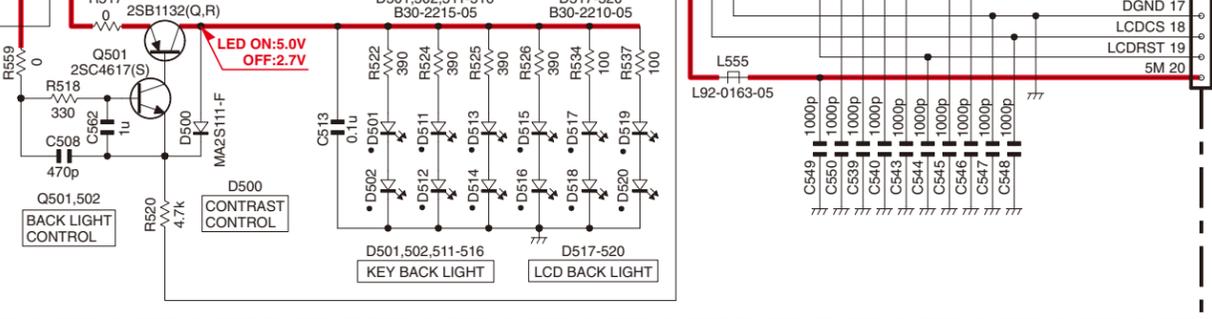
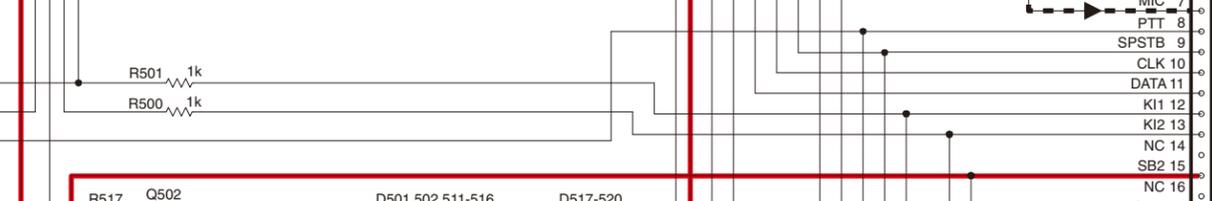
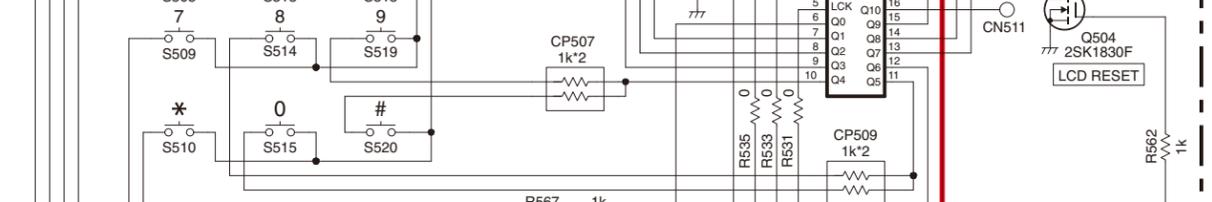
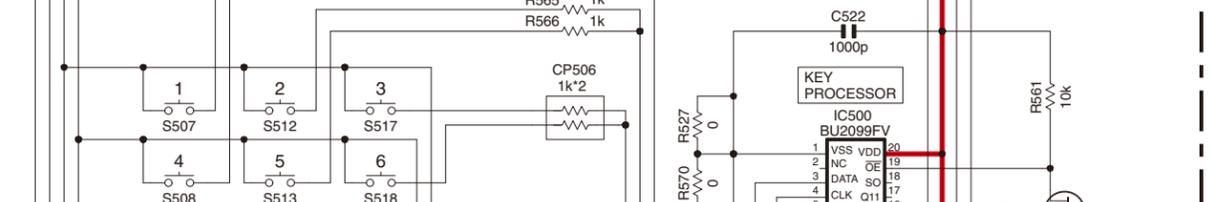
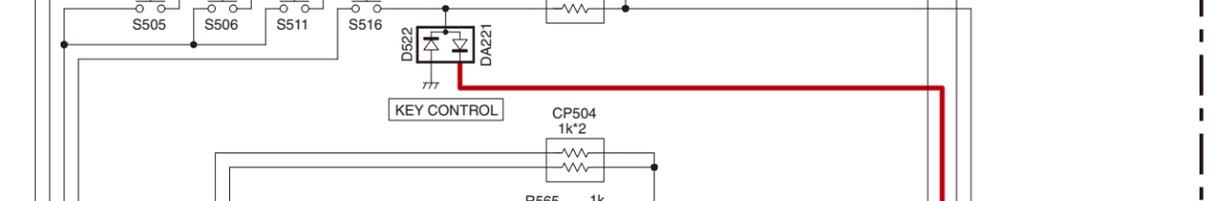
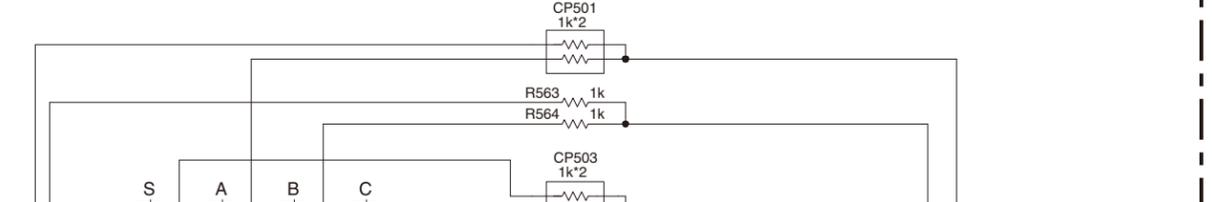
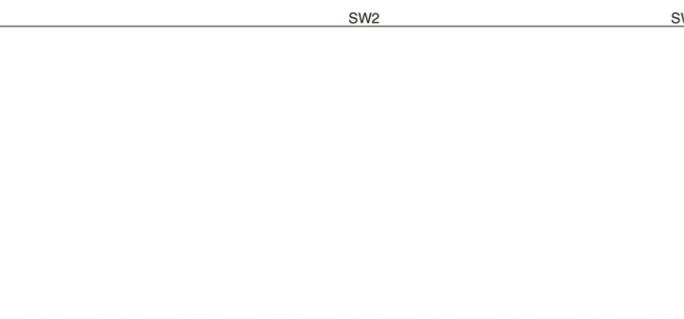
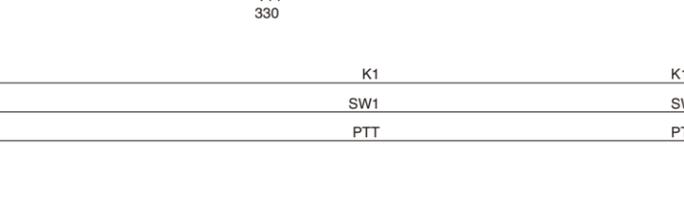
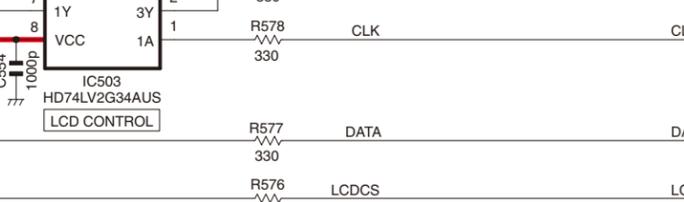
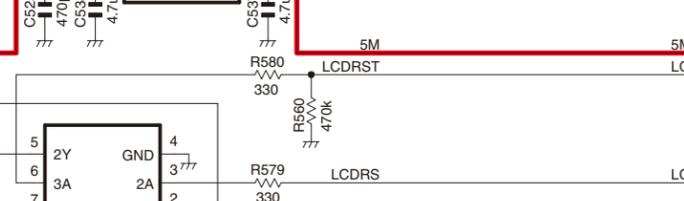
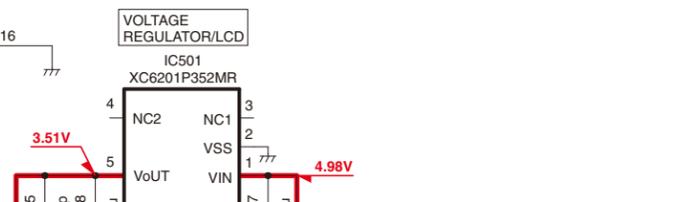
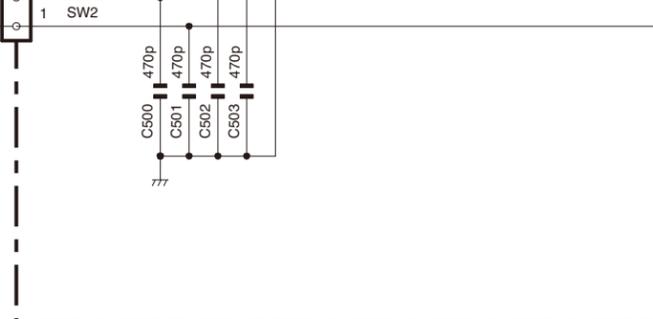
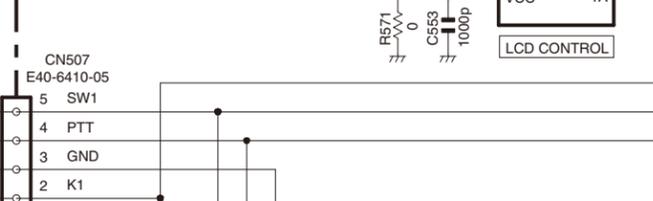
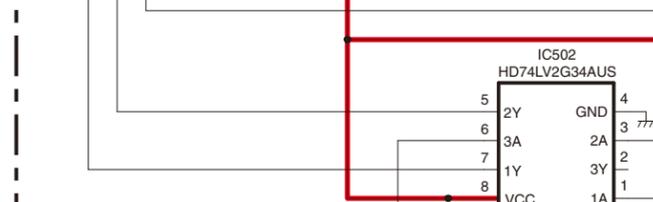
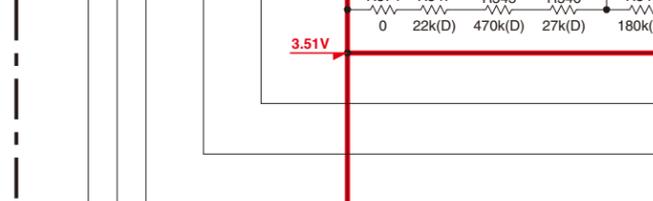
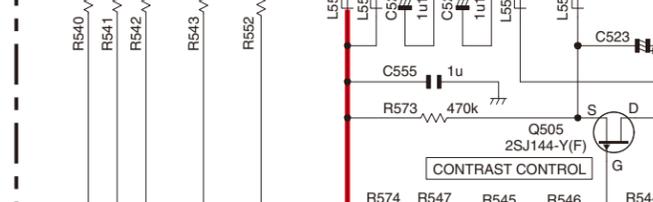
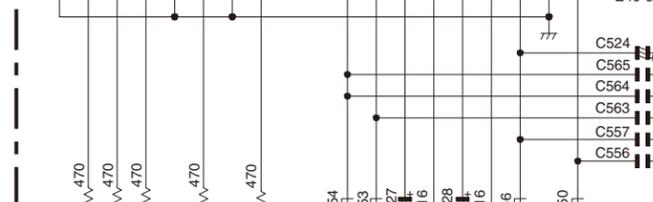
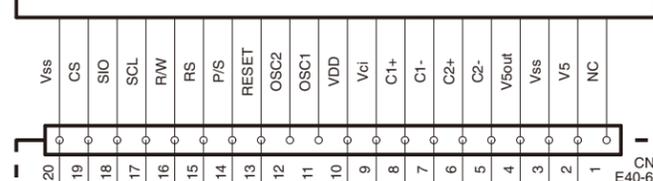
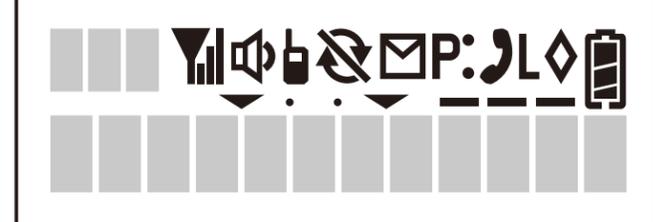
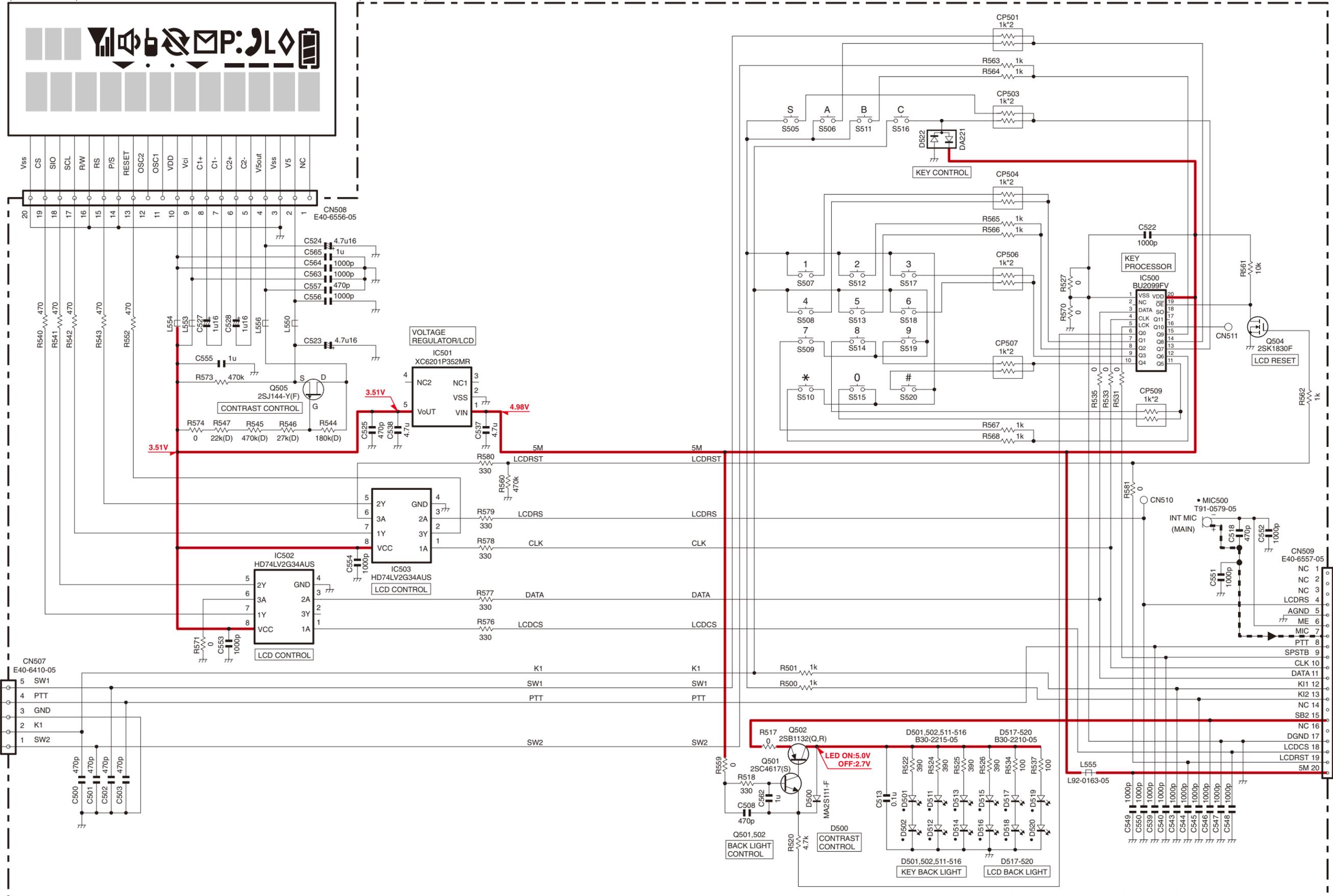


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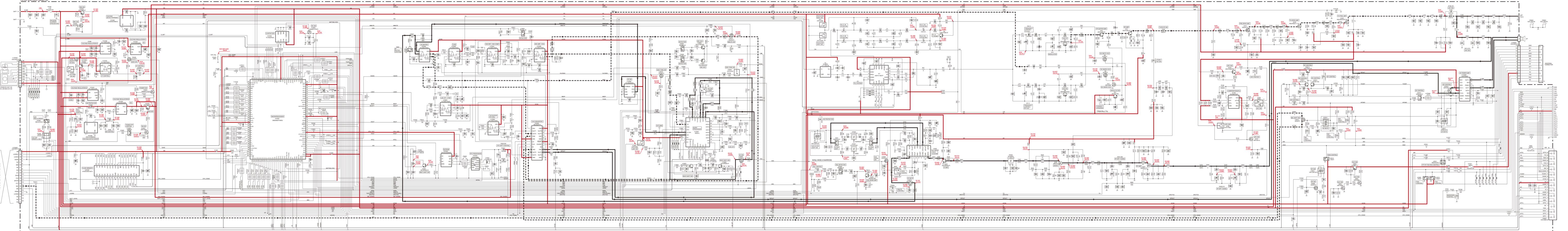
Component side
Layer 1 
Layer 2 
Foil side

LCD ASSY
(B38-0900-35)

DISPLAY UNIT
(X54-3472-72)



TO TX-RX UNIT CN500



TO DISPLAY UNIT C4609

Pin	Signal
1	SPK
2	EMC
3	MC
4	PT
5	NC
6	NC
7	NC
8	NC
9	NC
10	NC
11	NC
12	NC
13	NC
14	NC
15	NC
16	NC
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