

UHF FM TRANSCEIVER

# TK-3302

## SERVICE MANUAL

E,E3,T versions

# KENWOOD

Kenwood Corporation

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**E and E3 types does not come with the antenna.**



# TK-3302

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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:

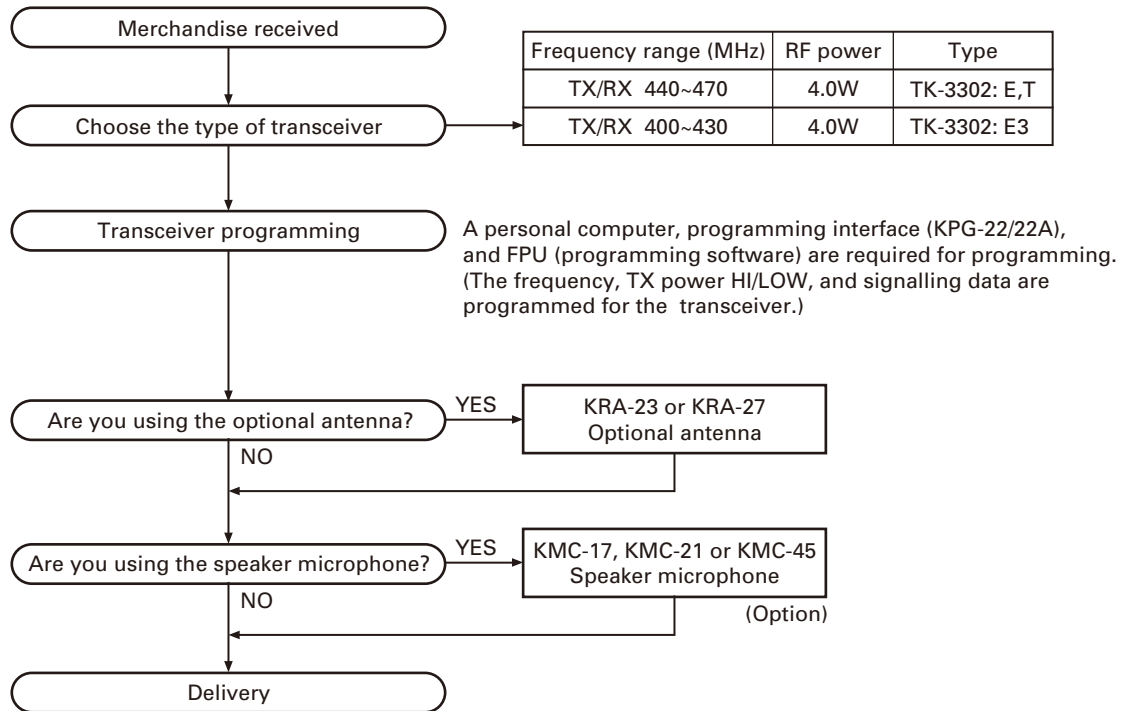
- DO NOT transmit until all RF connectors are verified secure and any open connectors are properly terminated.
- SHUT OFF and DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.
- This equipment should be serviced by a qualified technician only.

## SERVICE

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

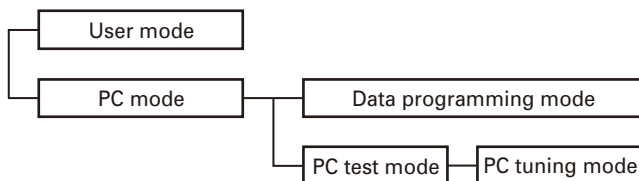
Model	Type	TX-RX unit	Frequency range	Remarks
TK-3302	E,T	X57-7582-71	440~470MHz	IF1: 38.85MHz LOC: 38.4MHz
TK-3302	E3	X57-7582-72	400~430MHz	

## SYSTEM SET-UP



## REALIGNMENT

### 1. Modes



Mode	Function
User mode	For normal use.
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.

### 2. How to Enter Each Mode

Mode	Operation
User mode	Power ON
PC mode	Received commands from PC

### 3. PC Mode

#### 3-1. Preface

The transceiver is programmed by using a personal computer, a programming interface (KPG-22/22A, USB adapter (KCT-53U)) and FPU (programming software).

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

#### 3-2. Connection Procedure

1. Connect the transceiver to the personal computer with the interface cable and USB adapter (when the interface cable is KPG-22A, the KCT-53U can be used).

## REALIGNMENT

### Note:

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

2. When the POWER is switched on, user mode can be entered immediately. When the PC sends a command, the transceiver enters PC mode.  
When data is read from the transceiver, the red LED lights.  
When data is written to the transceiver, the green LED lights.

### Note:

- The data stored in the personal computer must match Model Name and Model Type when it is written into EEPROM.
- Do not press the [PTT] key during data transmission or reception.

### 3-3. KPG-22/KPG-22A Description (PC programming interface cable: Option)

The KPG-22/22A is required to interface the transceiver with the computer. It has a circuit in its D-sub connector (KPG-22: 25-pin, KPG-22A: 9-pin) case that converts the RS-232C logic level to the TTL level.

The KPG-22/22A connects the SP/MIC connector of the transceiver to the RS-232C serial port of the computer.

### 3-4. KCT-53U Description (USB adapter: Option)

The KCT-53U is a cable which connects the KPG-22A to a USB port on a computer.

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

### 3-5. FPU (Programming Software) Description

The FPU is the programming software for the transceiver supplied on a CD-ROM. The software on this disk allows a user to program the transceiver via Programming interface cable (KPG-22/22A).

### 3-6. Programming with PC

If data is transferred to the transceiver from a PC with the FPU, the data for each set can be modified.

Data can be programmed into the EEPROM in RS-232C format via the SP/MIC jack.

In this mode the PTT line operate as TXD and RXD data lines respectively.

### List of FPU for transceiver

Model	Type	FPU
TK-3302	E,E3,T	KPG-119D(M2)

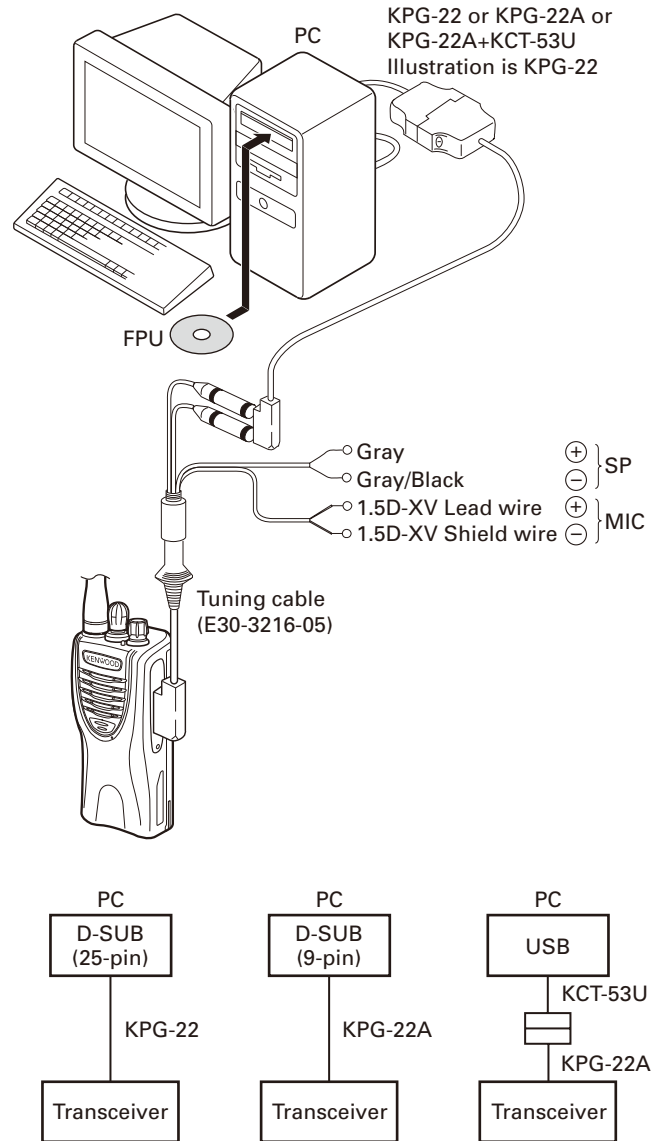
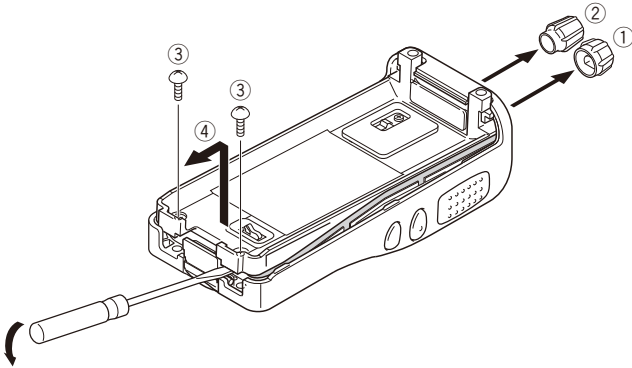


Fig. 1

## DISASSEMBLY FOR REPAIR

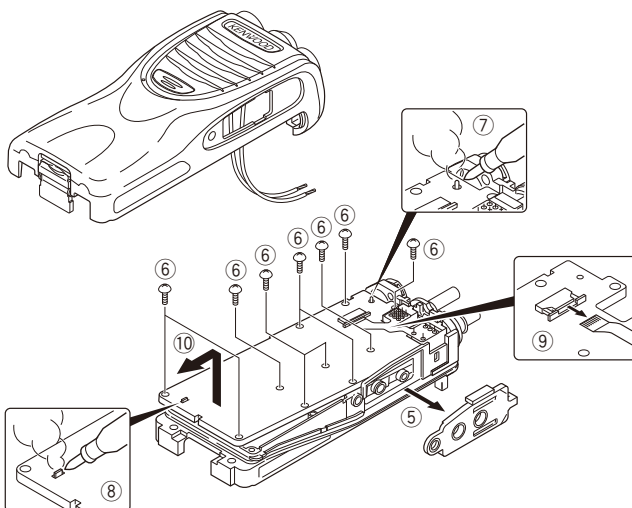
### 1. Removing the Case Assembly from the Chassis

1. Remove the volume knob ① and channel knob ②.
2. Remove the two screws ③.
3. Lift and remove the chassis from the case assembly ④.  
(Use a flat-blade screwdriver to easily lift the chassis.)



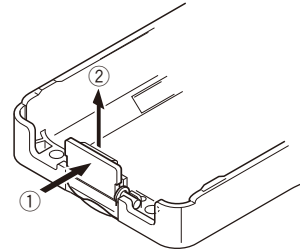
### 2. Removing the TX-RX unit from the Chassis

1. Detach the solder of speaker wire from the PCB beforehand.
  2. Remove the packing ⑤ from the SP/MIC jack of the TX-RX unit.
  3. Remove the ten screws ⑥ fixing the TX-RX unit.
  4. Remove the solder of the antenna terminal with a soldering iron ⑦.
  5. Remove the solder of the positive terminal with a soldering iron ⑧.
- Note:** You can remove the TX-RX unit from the chassis without removing the solder at the positive terminal. However, in this case, you can not attach the packing (G53-1605-03) that is on the positive terminal to the chassis in assembling. So, it is advisable to remove the solder on the positive terminal first.
6. Remove the FPC from the flat cable connector ⑨.
  7. Lift and remove the TX-RX unit from the chassis ⑩.



### 3. Removing the Battery Release Lever from the Case Assembly

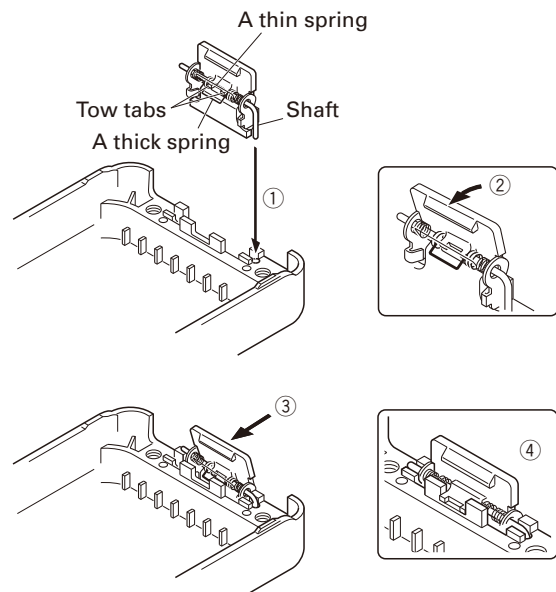
1. Press the upper part of the lever toward the inside of the case assembly. One side of the shaft will be removed ①.
2. Lift and remove the battery release lever from the case assembly ②.



### 4. Attaching the Battery Release Lever to the Case Assembly

1. Insert one side of the shaft into the hole at the lever fitting section on the case assembly ①.  
Caution: The thin spring (G01-4543-14) should be positioned above the two tabs of the lever.
2. Tilt the battery release lever slightly forward ②, so that the thick spring (G01-4542-04) is positioned below the case surface.
3. With the thick spring positioned below the case surface, attach the other side of the shaft to the case assembly by pressing the battery release lever ③ until it snaps into place ④.

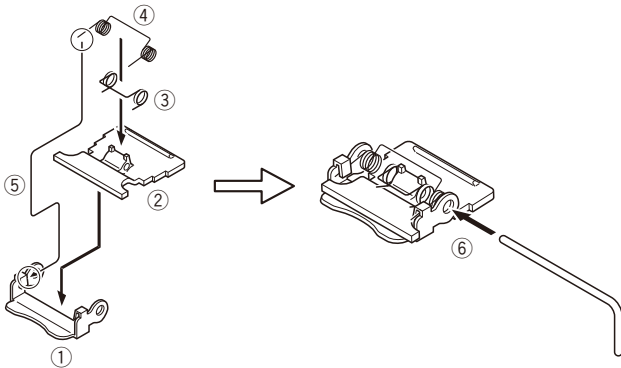
**Caution:** Be careful not to tilt the battery release lever too forward.  
If the battery release lever is pushed in this state where the two tabs come below the case surface, there is a possibility of damaging the two tabs.



## DISASSEMBLY FOR REPAIR

### 5. Assembling the Battery Release Lever

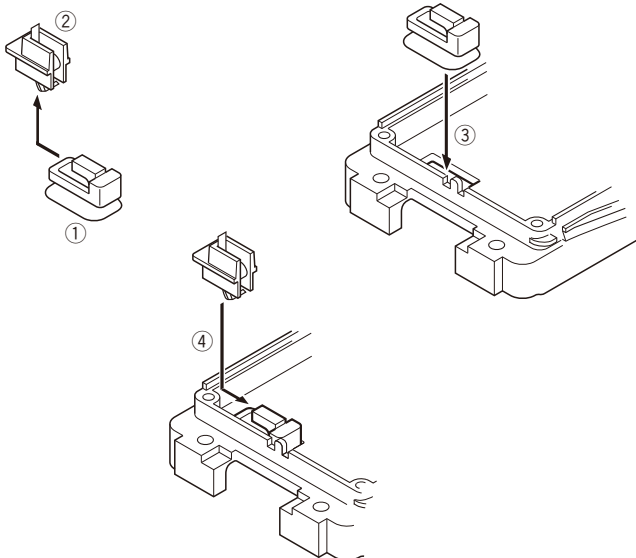
1. Place the lever ② onto the stopper ①.
2. Place the thick spring ③ onto the lever.
3. Hook the right and left ends of the thin spring ④ onto the tabs of the stopper, then place the thin spring onto the lever ⑤.
4. Slide the shaft through the hole of the stopper and lever ⑥.



### 6. Attaching the Positive Terminal to the Chassis

Always attach the positive terminal to the chassis, using the following procedures, before mounting the TX-RX unit onto the chassis.

1. Remove the holder assembly ② from the packing ① of the positive terminal.
2. Mount the packing of the positive terminal into the chassis hole ③.
3. Mount the holder assembly into the packing of the positive terminal ④.

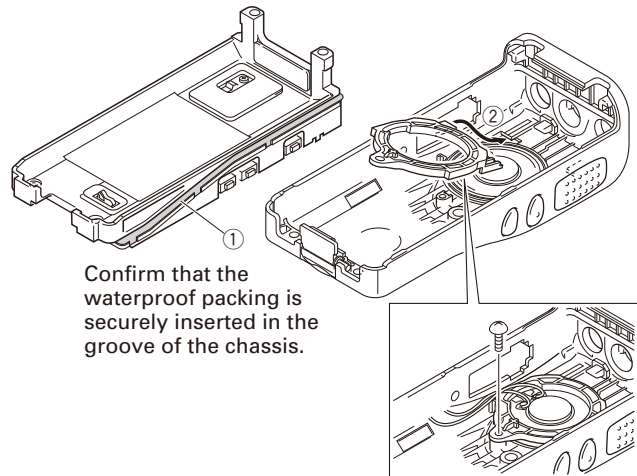


### 7. Mounting the Chassis to the Case Assembly

1. Confirm that the waterproof packing attached to the circumference of the chassis is securely inserted in the groove of the chassis ①.
2. Attach the speaker with waterproof packing to the speaker recess of the case assembly ②. Make sure the speaker clasp is securely inserted.
3. Tighten the speaker clasp into the case assembly with the screw.
4. Insert the upper part of the chassis into the case assembly ③.
5. Press the chassis ④ and the case assembly together to attach them.

**Caution:** Take care that the speaker lead wire is not caught by the microphone element.

**Caution:** If the packing of the SP/MIC does not come to the correct position after attaching the chassis to the case assembly, reposition the packing with your fingers.

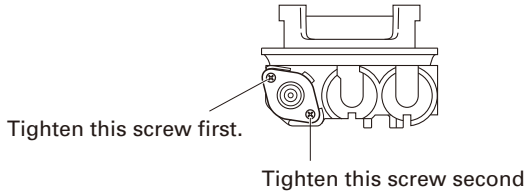


Confirm that the waterproof packing is securely inserted in the groove of the chassis.

## DISASSEMBLY FOR REPAIR

### 8. Attaching the Antenna Receptacle to the Chassis

Screw the antenna receptacle to the chassis in the order shown in the drawing so that the antenna receptacle comes to the center of the case hole.

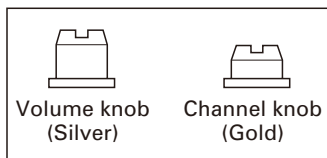


### 9. The Nuts of the Volume Knob and Channel Knob

Note that the shapes, colors and heights of nuts of the volume knob and channel knob are different from one another. (The nut of volume knob is silver, and the nut of channel knob is gold)

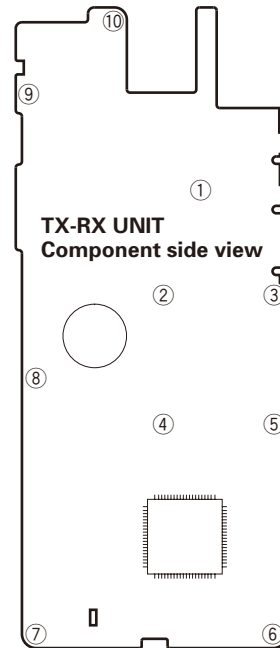
Use the following jig when removing the nuts of the volume knob and channel knob.

- Jig (Part No.: W05-1012-00)



### 10. Screw sequence for mounting the TX-RX unit to the chassis

Attach the TX-RX unit to the chassis using the screws in the order shown in the drawing below.

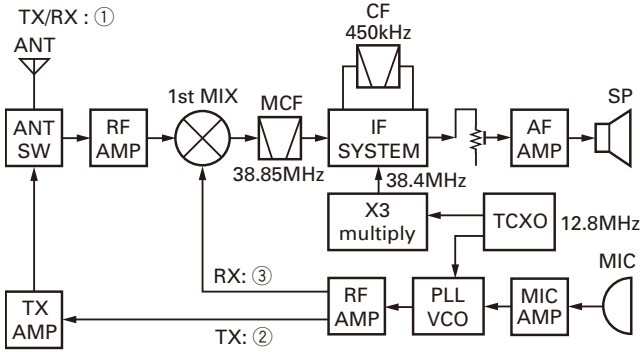


## CIRCUIT DESCRIPTION

### 1. Frequency Configuration

The receiver utilizes double conversion. The first IF is 38.85MHz and the second IF is 450kHz. The first local oscillator signal is supplied from the PLL circuit.

The PLL circuit in the transmitter generates the necessary frequencies. Fig. 1 shows the frequencies.



Model	Type	①	②	③
TK-3302	E,T	440~470MHz	440~470MHz	401.15~431.15MHz
TK-3302	E3	400~430MHz	400~430MHz	361.15~391.15MHz

Fig. 1 Frequency configuration

### 2. Receiver

The frequency configuration of the receiver is shown in Fig. 2.

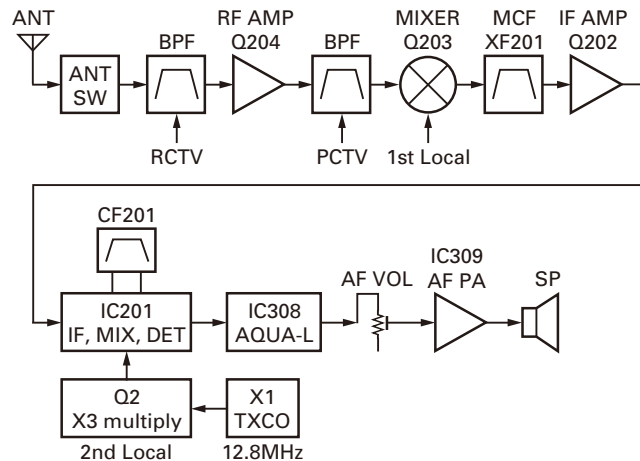


Fig. 2 Receiver section

#### ■ Front End (RF AMP)

The signal coming from the antenna passes through the transmit/receive switching diode circuit, (D103, D104 and D105) passes through a BPF (L213 and L212), and is amplified by the RF amplifier (Q204).

The resulting signal passes through a BPF (L209, L207 and L206) and goes to the mixer. These BPFs are adjusted by variable capacitors (D201, D202, D203, D204 and D205). The input voltage to the variable capacitor is regulated by voltage output from the MCU (IC306).

#### ■ First Mixer

The signal from the front end is mixed with the first local oscillator signal generated in the PLL circuit by Q203 to produce a first IF frequency of 38.85MHz.

The resulting signal passes through the XF201 MCF to cut the adjacent spurious and provide the optimum characteristics, such as adjacent frequency selectivity.

#### ■ IF Amplifier Circuit

The first IF signal is passed through a four-pole monolithic crystal filter (XF201) to remove the adjacent channel signal. The filtered first IF signal is amplified by the first IF amplifier (Q202) and then applied to the IF system IC (IC201). The IF system IC provides a second mixer, limiting amplifier, quadrature detector and RSSI (Received Signal Strength Indicator). The second mixer mixes the first IF signal with the 38.4MHz of the second local oscillator output (TCXO X1 and Q2) and produces the second IF signal of 450kHz.

The second IF signal is passed through the ceramic filter (CF201) to remove the adjacent channel signal. The filtered second IF signal is amplified by the limiting amplifier and demodulated by the quadrature detector with the ceramic discriminator (CD201). The demodulated signal is routed to the audio circuit.

#### ■ Wide/Narrow Switching Circuit

Narrow and Wide settings can be made for each channel by switching the demodulation level.

The WIDE (low level) and NARROW (high level) data is output from IC306, pin 5. When a WIDE (low level) data is received, Q201 turn on. When a NARROW (high level) data is received, Q201 turn off.

Q201 turns on/off with the Wide/Narrow data and the IC201 detector output level is switched to maintain a constant output level during wide or narrow signals.

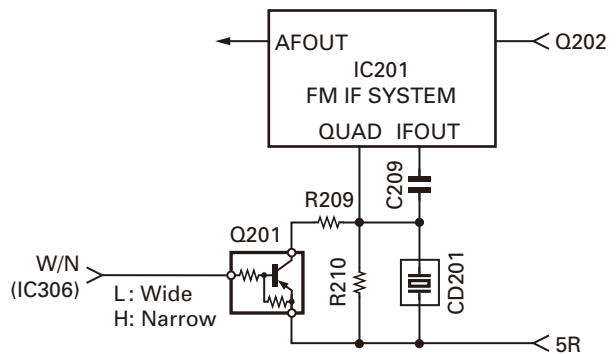


Fig. 3 Wide/Narrow switching circuit



## CIRCUIT DESCRIPTION

### ■ Audio Amplifier Circuit

The demodulated signal from IC201 goes to AF amplifier through IC308.

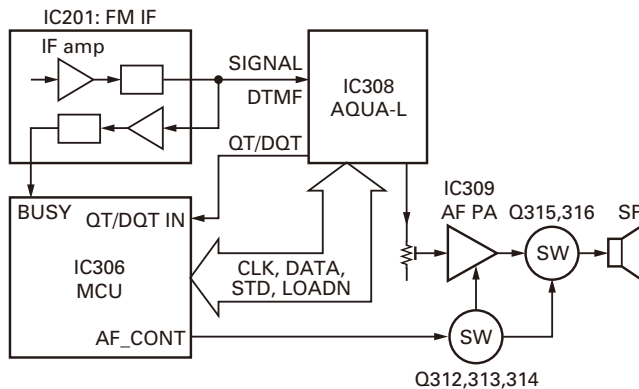
The signal then goes through an AF volume control, and is routed to an audio power amplifier (IC309) where it is amplified and output to the speaker.

### ■ Squelch

Part of the AF signal from the IC enters the FM IC (IC201) again, and the noise component is amplified and rectified by a filter and an amplifier to produce a DC voltage corresponding to the noise level.

The DC signal from the FM IC goes to the analog port of the MCU (IC306). IC306 determines whether to output sounds from the speaker by checking whether the input voltage is higher or lower than the preset value.

To output sounds from the speaker, IC306 sends a high signal to the AF\_CONT line and turns IC309 on through Q312, Q313, Q314, Q315 and Q316. (See Fig. 4)



**Fig. 4 AF amplifier and squelch**

### ■ Receive Signaling

#### • QT/DQT

The output signal from FM IC (IC201) enters the MCU (IC306) through IC308. IC306 determines whether the QT or DQT matches the preset value, and controls the SP MUTE and the speaker output sounds according to the squelch results.

### 3. PLL Frequency Synthesizer

The PLL circuit generates the first local oscillator signal for reception and the RF signal for transmission.

#### ■ PLL

The frequency step of the PLL circuit is 5 or 6.25kHz.

A 12.8MHz reference oscillator signal is divided at IC1 by a fixed counter to produce an oscillator (VCO) output signal which is buffer amplified by Q3 then divided in IC1 by a programmable counter. The divided signal is compared in phase with the 5 or 6.25kHz reference signal from the phase comparator in IC1. The output signal from the phase comparator is filtered through a low-pass filter and passed to the VCO to control the oscillator frequency. (See Fig. 5)

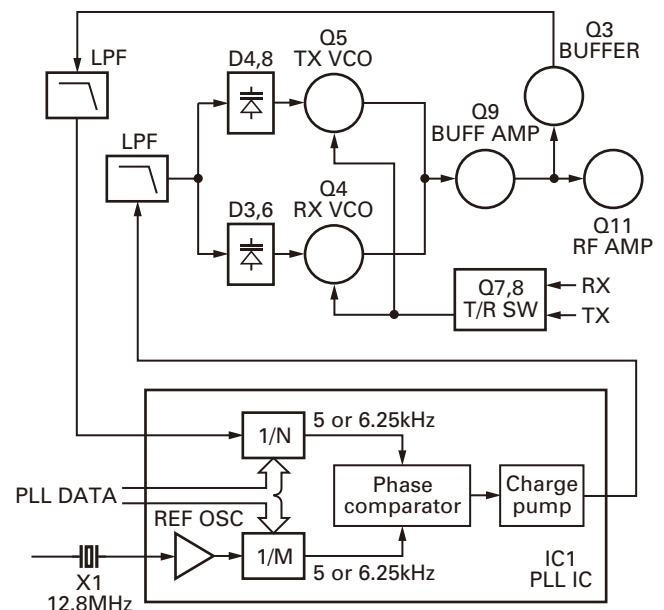
#### ■ VCO

The operating frequency is generated by Q5 in transmit mode and Q4 in receive mode. The oscillator frequency is controlled by applying the VCO control voltage, obtained from the phase comparator, to the varactor diodes (D4 and D8 in transmit mode and D3 and D6 in receive mode).

The RX\_SW pin is set high in receive mode causing Q7 turn on. The TX\_SW pin is set high in transmit mode. The outputs from Q4 and Q5 are amplified by Q9 and sent to the RF amplifiers.

#### ■ Unlock Detector

If a pulse signal appears at the LD pin of IC1, an unlock condition occurs, and the DC voltage obtained from C4 and Q1 causes the voltage applied to the MCU to go low. When the MCU detects this condition, the transmitter is disabled, ignoring the push-to-talk switch input signal.



**Fig. 5 PLL circuit**

## CIRCUIT DESCRIPTION

### 4. Transmitter System

#### ■ Microphone Amplifier

The signal from the microphone passes through the IC308. When encoding DTMF, it is turned OFF for muting the microphone input signal by IC308.

The signal passes through the Audio processor (IC308) for the maximum deviation adjustment, and goes to the VCO modulation input.

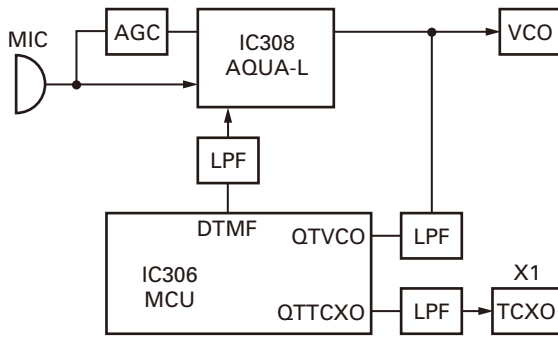


Fig. 6 Microphone amplifier

#### ■ Drive and Final Amplifier

The signal from the T/R switch (D10 is on) is amplified by the pre-drive (Q101 and Q102) and the drive amplifier (Q103) to 500mW.

The output of the drive amplifier is amplified by the RF power amplifier (Q106) to 4.0W (1W when the power is low). The output of the RF power amplifier is then passed through the harmonic filter (LPF) and antenna switch (D103) and applied to the antenna terminal.

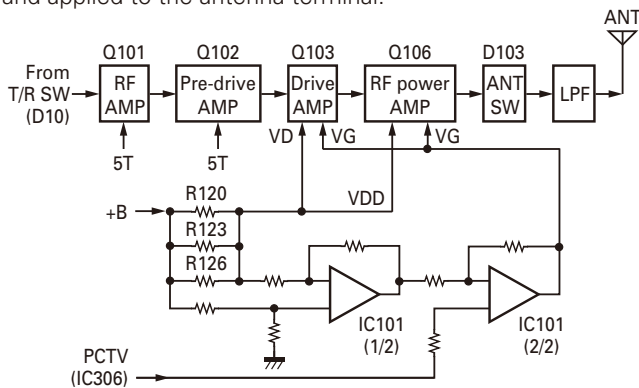


Fig. 7 Drive and final amplifier and APC circuit

#### ■ APC Circuit

The APC circuit always monitors the current flowing through the drive amplifier and RF power amplifier (Q103 and Q106) and keeps a constant current.

The voltage drop at R120, R123 and R126 is caused by the current flowing through the RF power amplifier and drive amplifier, and this voltage is applied to the differential amplifier IC101 (1/2).

IC101 (2/2) compares the output voltage of IC101 (1/2) with the reference voltage from IC306. The output of IC101 (2/2) controls the VG of the RF power amplifier and drive amplifier to make both voltages the same.

The change of power high/low is carried out by the change of the reference voltage.

#### ■ Encode Signaling

##### • QT/DQT

QT/DQT data of the QTTXCO Line is output from pin 14 of the MCU. The signal passes through a low-pass CR filter and goes to the TCXO (X1).

The QT/DQT data of the QTVCO Line is output from pin 15 of the MCU. The signal passes through a low pass CR filter, mixes with the audio signal, and goes to the VCO modulation input. TX deviation is adjusted by the MCU.

### 5. Power Supply

There are four 5V power supplies in the transceiver: 5M, 5C, 5R, and 5T. 5M for MCU is always output while the power is on. 5M is always output, but turns off when the power is turned off to prevent malfunction of the MCU.

5C is a common 5V and is output when SAVE is not set to OFF.

5R is 5V for reception and output during reception.

5T is 5V for transmission and output during transmission.

### 6. Control Circuit

The control circuit consists of a MCU (IC306) and its peripheral circuits. It controls the TX-RX unit. IC306 mainly performs the following:

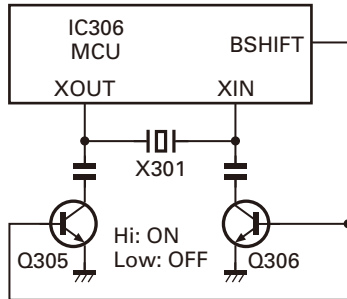
- 1) Switching between transmission and reception by the PTT signal input.
- 2) Reading system, group, frequency, and program data from the memory circuit.
- 3) Sending frequency program data to the PLL.
- 4) Controlling squelch on/off by the DC voltage from the squelch circuit.
- 5) Controlling the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

## CIRCUIT DESCRIPTION

### ■ Frequency Shift Circuit

The MCU (IC306) operates at a clock of 14.746 MHz. This oscillator has a circuit that shifts the frequency by BEAT SHIFT SW (Q305, Q306).

A beat sound may be able to be evaded from generation if "Beat Shift" is set to ON when it is generated in the internal spurious transmission modulated sound of a transceiver.



**Fig. 8 Frequency shift circuit**

### ■ Memory Circuit

Memory circuit consists of the MCU (IC306) and an EEPROM (IC305). An EEPROM has a capacity of 16k bits that contains the transceiver control program for the MCU and data such as transceiver channels and operating features.



**Fig. 9 Memory circuit**

### ■ Low Battery Warning

The battery voltage is checked using by the MCU. The transceiver generates a warning tone when it falls below the warning voltage shown in the table.

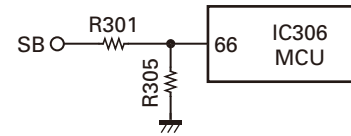
1) The red LED blinks when the battery voltage falls below the voltage (1) shown in the table during transmission.

**Note:** The transceiver checks the battery voltage during reception even when, in the FPU, the Battery Warning status function is set to "On TX" (default setting).

However, the LED does not blink during reception. During transmission, the LED blinks to generate the warning tone of a low battery voltage.

2) The transceiver immediately stops transmission when the battery voltage falls below the voltage (2) shown in the table. A message tone beeps while the PTT switch is released.

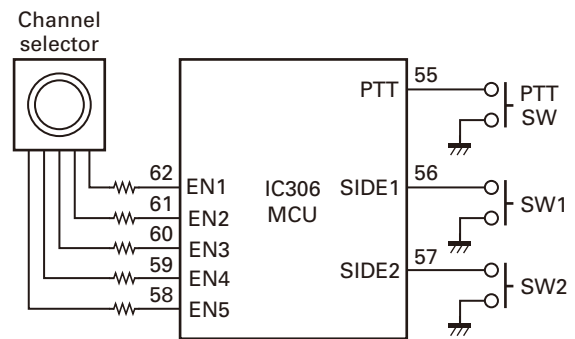
	Ni-Cd Battery	Ni-MH Battery	Li-ion Battery
(1)	6.2V	6.2V	6.2V
(2)	5.9V	5.9V	5.9V



**Fig. 10 Low battery warning**

## 7. Control System

Keys and channel selector circuit. The signal from the keys and channel selector are directly input to the MCU, as shown in Fig. 11.



**Fig. 11 Control system**

## SEMICONDUCTOR DATA

## MCU: R5F212CCKCMC (TX-RX unit IC306)

Pin No.	Signal Name	I/O	Function
1	5T_C	O	5T control
2	PLL_STB	O	PLL strobe
3	5C_C	O	5C control
4	5R_C	O	5R control
5	W/N	O	Wide/Narrow switch
6	MODE	I	No function
7	AF_CONT	O	Speaker mute
8	BSHIFT	O	Beat shift control
9	RESET	I	MCU reset
10	XOUT	O	MCU clock (14.746MHz)
11	VSS	-	GND
12	XIN	I	MCU clock (14.746MHz)
13	VCC	I	Power supply input
14	QTTCXO	O	QT/DQT output
15	QTVCO	O	QT/DQT output
16~21	AUX6~AUX1	I/O	No function
22	MIC_MUTE	O	MIC mute
23	AF_MUTE	O	No function
24~32	N.C	O	No function
33	RXDATA	I	No function
34	TXDATA	O	No function
35	OPTDET	I	Headset detect
36	TX_SW	O	TX VCO switch
37	RX_SW	O	RX VCO switch
38	LEDRX	O	Green LED control
39	LEDTX	O	Red LED control
40	APC_SW	O	APC switch
41	DC_SW	O	APC discharge switch
42	STD	I	Baseband IC data input
43	1/2 OSC	O	Baseband IC clock (3.6864MHz)
44	INT	I	No function
45	TXD	O	Serial data output

Pin No.	Signal Name	I/O	Function
46	RXD	I	Serial data input
47	DIR	O	Baseband IC data output
48	DI/O	I/O	Baseband IC data input / output
49	DTRLOADN	O	Baseband IC data output
50	TDATA/DTRCLK	O	Baseband IC data output
51	SCLK	O	Serial clock for baseband IC
52	TCLK/DTRDO	I	Baseband IC data input
53	RDF/FD	I	Baseband IC data input
54	MDSW	I	No function
55	PTT	I	PTT switch input
56	SIDE1	I	Side1 key input
57	SIDE2	I	Side2 key input
58~62	EN5~EN1	I	Channel selector input
63	DIST1	I	No function
64	DIST2	I	No function
65	PLL_UL	I	PLL unlock signal input
66	BATT	I	Battery voltage detect
67	RSSI	I	RSSI input
68	BUSY	I	Busy signal input
69	VOX	I	VOX signal detect
70	QT/DQT_IN	I	QT/DQT signal input
71	EEPCLK	O	EEPROM clock
72	EEPDAT	I/O	EEPROM data input / output
73	TH_DET	I	Temperature detect
74	DTMF	I	DTMF/BEEP output
75	AVSS	-	GND
76	PCTV	I	APC/BPF control voltage
77	VREF	I	Reference voltage input
78	AVCC	I	Power supply input
79	PLL_DAT	O	PLL data output
80	PLL_CLK	O	PLL clock output

## TERMINAL FUNCTION

## TX-RX unit (X57-7582-XX)

Pin No.	Name	I/O	Function
<b>CN301</b>			
1	B	I	B (Battery Voltage)
2	SB	O	Switched B
3	AFVOL_IN	I	Audio input
4	AFVOL_OUT	O	Audio output
5	AFVOL_GND	-	GND

Pin No.	Name	I/O	Function
6	EN1	I	Encoder pulse input
7	EN2	I	Encoder pulse input
8	GND	-	GND
9	EN3	I	Encoder pulse input
10	EN4	I	Encoder pulse input
11	EN5	I	Encoder pulse input

## COMPONENTS DESCRIPTION

### TX-RX unit (X57-7582-XX)

Ref. No.	Part Name	Description
IC1	IC	PLL system IC
IC101	IC	APC
IC201	IC	FM system IC
IC301	IC	Voltage detector/ Reset
IC303,304	IC	Voltage regulator/ 5V
IC305	IC	EEPROM
IC306	IC	MCU
IC308	IC	Audio processor
IC309	IC	Audio amplifier
Q1	Transistor	Rectification
Q2	Transistor	Tripler
Q3	Transistor	RF amplifier
Q4	FET	VCO/ RX
Q5	FET	VCO/ TX
Q6	Transistor	Rectification
Q7	Transistor	DC switch/ RX VCO
Q8	Transistor	DC switch/ TX VCO
Q9	Transistor	RF amplifier
Q10	Transistor	Ripple filter
Q11	Transistor	RF amplifier
Q101,102	Transistor	RF amplifier
Q103	FET	TX drive amplifier
Q106	FET	TX final amplifier
Q107	Transistor	DC switch
Q108	FET	DC switch
Q109	Transistor	DC switch
Q201	Transistor	Wide/Narrow switch/ RX
Q202	Transistor	IF amplifier
Q203	FET	Mixer
Q204	FET	Low noise amplifier
Q301	Transistor	DC switch/ Red color LED

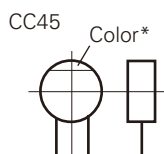
Ref. No.	Part Name	Description
Q302	Transistor	DC switch/ Green color LED
Q303	Transistor	DC switch/ 5R
Q304	Transistor	DC switch/ 5T
Q305,306	Transistor	Beat shift switch
Q307	Transistor	Wide/Narrow switch/ TX
Q308	Transistor	Rectification
Q310,311	Transistor	MIC mute
Q312,313	Transistor	DC switch
Q314	Transistor	Mute switch
Q315,316	FET	Mute switch
D2,3	Variable Capacitance Diode	Frequency control/ RX VCO
D4	Variable Capacitance Diode	Frequency control/ TX VCO
D6	Variable Capacitance Diode	Frequency control/ RX VCO
D8	Variable Capacitance Diode	Frequency control/ TX VCO
D9	Variable Capacitance Diode	Modulator
D10	Diode	TX/RX RF switch
D101	Zener diode	Voltage protection
D103,104	Diode	ANT switch
D106	Diode	ANT switch
D201~205	Variable Capacitance Diode	RF BPF tuning
D301	Diode	Reverse voltage protection
D302	Diode	Rectification
D303	LED	Red color LED
D304	LED	Green color LED
D306	Diode	Rectification
D307	Diode	Limiter
D308,309	Diode	Rectification

## PARTS LIST

### CAPACITORS

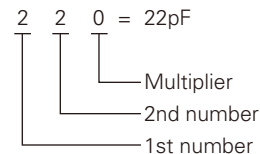
$\frac{C}{1} \frac{C}{2} \frac{45}{3} \frac{TH}{4} \frac{1H}{5} \frac{220}{6} \frac{J}{6}$

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



#### • Capacitor value

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



#### • Temperature coefficient

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

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

Example : CC45TH = -470±60ppm/°C

#### • Tolerance (More than 10pF)

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

#### (Less than 10pF)

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

#### • Voltage rating

2nd word \ 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	2150	4000	5000	6300	8000	-

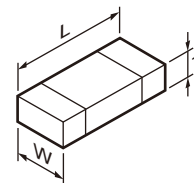
#### • Chip capacitors

(EX)  $\frac{C}{1} \frac{C}{2} \frac{73}{3} \frac{F}{4} \frac{SL}{5} \frac{1H}{6} \frac{000}{7} \frac{J}{7}$  Refer to the table above.  
 (Chip) (CH, RH, UJ, SL)

(EX)  $\frac{C}{1} \frac{K}{2} \frac{73}{3} \frac{F}{4} \frac{F}{5} \frac{1H}{6} \frac{000}{7} \frac{Z}{7}$   
 (Chip) (B, F)

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

#### • Dimension



#### Chip capacitor

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

#### Chip resistor

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

### RESISTORS

#### • Chip resistor (Carbon)

(EX)  $\frac{R}{1} \frac{D}{2} \frac{73}{3} \frac{E}{4} \frac{B}{5} \frac{2B}{6} \frac{000}{7} \frac{J}{7}$   
 (Chip) (B, F)

#### • Carbon resistor (Normal type)

(EX)  $\frac{R}{1} \frac{D}{2} \frac{14}{3} \frac{B}{4} \frac{B}{5} \frac{2C}{6} \frac{000}{7} \frac{J}{7}$

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

#### • Rating wattage

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

## 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-3302 (Y50-635X-XX)**

**TX-RX UNIT (X57-7582-XX)**

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
<b>TK-3302</b>					
1	1A		A02-4040-03	PLASTIC CABINET ASSY	
2	3A	*	A10-4124-11	CHASSIS	
4	2C,2E		B09-0725-03	CAP ACCESSORY	
7	1C,1E	*	B62-2110-00	INSTRUCTION MANUAL	
9	1A		D10-0649-03	LEVER	
10	1A		D21-0863-04	SHAFT	
11	1A		D32-0441-13	STOPPER	
13	2B		E04-0477-15	RF COAXIAL RECEPTACLE (SMA)	
14	3A		E23-1253-04	TERMINAL (BATT-)	
15	2A		E23-1254-04	TERMINAL (BATT+)	
16	2B		E37-1175-15	SPEAKER WIRE LEAD (BROWN)	
17	2B		E37-1176-15	SPEAKER WIRE LEAD (GREEN)	
19	3A		F20-3353-14	INSULATING SHEET (CHASSIS-BATT+)	
21	1A		G01-4542-04	COIL SPRING (LEVER)	
22	1A		G01-4543-14	COIL SPRING (STOPPER)	
23	2A		G10-1330-04	FIBROUS SHEET (AUDIO IC)	
24	2A		G11-4465-04	RUBBER SHEET (FINAL FET)	
25	3B		G13-2009-04	CUSHION (CHASSIS)	
26	3A		G13-2033-04	CUSHION (BATT-)	
27	3A		G13-2034-14	CUSHION (CHASSIS-)	
28	3A		G13-2038-24	CUSHION (CHASSIS-CERAMIC FILTER)	
29	2A		G13-2039-14	CUSHION (PCB-CERAMIC FILTER)	
30	1A	*	G13-2285-04	CUSHION	
31	3A		G53-1604-03	PACKING (CHASSIS)	
32	2A		G53-1605-03	PACKING (BATT+)	
33	2A		G53-1609-14	PACKING (ECM)	
34	2B		G53-1799-03	PACKING (VOLUME/SELECTOR)	
35	1B		G53-1800-03	PACKING (SP/MIC)	
36	1B		G53-1801-03	PACKING (SPEAKER)	
37	2B		G53-1802-04	PACKING (SMA)	
46	2A		J19-5463-03	HOLDER (BATT+)	
47	2A		J19-5473-03	HOLDER ASSY (BATT+)	
48	2C,2E		J19-5521-03	HOLDER	
49	2B		J19-5522-03	SPEAKER CLASP	
50	1D,2E		J29-0734-05	BELT HOOK ACCESSORY	
51	2A		J82-0121-05	FPC	
52	1A		J99-0737-04	ADHESIVE SHEET (PTT)	
54	1B		K29-9309-13	KNOB (VOLUME)	
55	1A		K29-9425-03	BUTTON KNOB (PTT)	
56	1A		K29-9426-03	BUTTON KNOB (MONI/PF)	
57	1B		K29-9427-03	KNOB (SELECTOR)	
A	3B		N14-0848-05	CIRCULAR NUT (SELCTOR)	
B	3B		N14-0849-05	CIRCULAR NUT (VOLUME)	
C	2B		N30-2604-48	PAN HEAD MACHINE SCREW	
D	3A		N30-2606-48	PAN HEAD MACHINE SCREW	
E	2A,3A,2B		N83-2005-48	PAN HEAD TAPTITE SCREW	
61	2C,2E		N99-2046-05	SCREW SET ACCESSORY	
63	2A	*	R31-0670-15	VARIABLE RESISTOR	
65	2A		S60-0440-05	ROTARY SWITCH	

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
67	1B		T07-0369-15	SPEAKER	
68	2F		T90-1039-25	WHIP ANTENNA ACCESSORY	T
71	1F		W08-0988-05	CHARGER (KSC-35)	T
72	1F		W08-0993-05	AC ADAPTER (SWITCHING)	T
<b>TX-RX UNIT (X57-7582-XX) -71: E,T -72: E3</b>					
D303			B30-2315-05	LED (RED)	
D304			B30-2314-05	LED (GREEN)	
C1			CK73HB1H332K	CHIP C 3300PF K	
C2			CK73HB1C682K	CHIP C 6800PF K	
C3			CK73GB1A105K	CHIP C 1.0UF K	
C4			CK73HB1A104K	CHIP C 0.10UF K	E,T
C4			CK73HB1A334K	CHIP C 0.33UF K	E3
C5			CK73HB1H471K	CHIP C 470PF K	
C6			CK73HB1E103K	CHIP C 0.010UF K	E,T
C6			CK73HB1H471K	CHIP C 470PF K	E3
C7			CC73HCH1H100D	CHIP C 10PF D	
C8-10			CC73HCH1H101J	CHIP C 100PF J	
C11			CK73FB1H471K	CHIP C 470PF K	
C12			CK73HB1H471K	CHIP C 470PF K	
C13			CC73HCH1H100D	CHIP C 10PF D	
C14			CK73HB1E103K	CHIP C 0.010UF K	
C15			CK73HB1H471K	CHIP C 470PF K	
C16			CC73HCH1H470J	CHIP C 47PF J	
C17			CK73HB1E103K	CHIP C 0.010UF K	
C18			CC73HCH1H180J	CHIP C 18PF J	
C21			CK73HB1E103K	CHIP C 0.010UF K	
C22			CK73FB0J106K	CHIP C 10UF K	
C23			CK73HB1E103K	CHIP C 0.010UF K	
C25			CC73HCH1H270J	CHIP C 27PF J	E,T
C25			CC73HCH1H300J	CHIP C 30PF J	E3
C26			CC73HCH1H020B	CHIP C 2.0PF B	
C27			CS77AA1VR33M	CHIP TNTL 0.33UF 35WV	
C29			CC73HCH1H270J	CHIP C 27PF J	
C30			CK73HB1H471K	CHIP C 470PF K	
C31			CK73HB1E103K	CHIP C 0.010UF K	
C32			CS77CA1C3R3M	CHIP TNTL 3.3UF 16WV	
C33			CK73HB1H471K	CHIP C 470PF K	
C35			CS77CA1V0R1M	CHIP TNTL 0.1UF 35WV	
C36			CK73HB1H332K	CHIP C 3300PF K	
C37			CS77CA1V0R1M	CHIP TNTL 0.1UF 35WV	
C38			CK73HB1H471K	CHIP C 470PF K	E3
C39			CK73HB1C682K	CHIP C 6800PF K	
C40			CC73HCH1H050B	CHIP C 5.0PF B	
C41			CC73HCH1H030B	CHIP C 3.0PF B	
C42			CC73HCH1H050B	CHIP C 5.0PF B	
C43			CC73HCH1H101J	CHIP C 100PF J	E3
C43			CK73HB1H471K	CHIP C 470PF K	E,T
C44,45			CK73GB1A105K	CHIP C 1.0UF K	
C47			CC73HCH1H100C	CHIP C 10PF C	
C48			CC73HCH1H030B	CHIP C 3.0PF B	E3
C50			CK73HB1H471K	CHIP C 470PF K	
C51			CC73HCH1H030B	CHIP C 3.0PF B	

## PARTS LIST

## TX-RX UNIT (X57-7582-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C52			CC73HCH1H060B	CHIP C 6.0PF B	E,T	C125			CC73HCH1H100B	CHIP C 10PF B	E,T
C52			CC73HCH1H090B	CHIP C 9.0PF B	E3	C125			CC73HCH1H150J	CHIP C 15PF J	E3
C53			CC73HCH1H070B	CHIP C 7.0PF B	E3	C126			CC73HCH1H120J	CHIP C 12PF J	E,T
C53			CC73HCH1H110J	CHIP C 11PF J	E,T	C127			CC73HCH1H220J	CHIP C 22PF J	E,T
C54			CC73HCH1H3R5B	CHIP C 3.5PF B	E3	C127			CC73HCH1H470J	CHIP C 47PF J	E3
C55			CC73HCH1H0R5B	CHIP C 0.5PF B	E3	C128			CK73HB0J105K	CHIP C 1.0UF K	E3
C55			CC73HCH1H020B	CHIP C 2.0PF B	E,T	C129			CK73HB1H471K	CHIP C 470PF K	
C56			CC73HCH1H080B	CHIP C 8.0PF B	E3	C130			CK73GB0J225K	CHIP C 2.2UF K	E,T
C56			CC73HCH1H120J	CHIP C 12PF J	E,T	C130			CK73GB1A105K	CHIP C 1.0UF K	E3
C57			CC73HCH1H060B	CHIP C 6.0PF B	E,T	C131			CK73HB1E103K	CHIP C 0.010UF K	
C57			CC73HCH1H200J	CHIP C 20PF J	E3	C133			CK73GB1A105K	CHIP C 1.0UF K	
C58			CC73HCH1H010B	CHIP C 1.0PF B	E,T	C135,136			CK73HB1H471K	CHIP C 470PF K	
C58,59			CC73HCH1H1R5B	CHIP C 1.5PF B	E3	C137			CC73HCH1H101J	CHIP C 100PF J	
C59			CC73HCH1H1R5B	CHIP C 1.5PF B	E,T	C140			CK73HB1H471K	CHIP C 470PF K	
C60			CC73HCH1H040B	CHIP C 4.0PF B		C141			CK73HB1A104K	CHIP C 0.10UF K	
C61			CC73HCH1H030B	CHIP C 3.0PF B	E,T	C142			CC73GCH1H430J	CHIP C 43PF J	E,T
C61			CC73HCH1H070B	CHIP C 7.0PF B	E3	C142			CC73GCH1H470J	CHIP C 47PF J	E3
C62			CK73HB1H471K	CHIP C 470PF K		C144			CK73HB1H471K	CHIP C 470PF K	
C63			CC73HCH1H060B	CHIP C 6.0PF B		C145			CC73GCH1H360J	CHIP C 36PF J	E3
C64			CC73HCH1H050B	CHIP C 5.0PF B	E,T	C146			CC73GCH1H120J	CHIP C 12PF J	E,T
C64			CC73HCH1H3R5B	CHIP C 3.5PF B	E3	C147			CK73FB1A106K	CHIP C 10UF K	E3
C65			CC73HCH1H040B	CHIP C 4.0PF B	E3	C154			CK73HB1H471K	CHIP C 470PF K	
C65			CC73HCH1H060B	CHIP C 6.0PF B	E,T	C155			CC73GCH1H0R3B	CHIP C 0.3PF B	E3
C66			CK73HB1H471K	CHIP C 470PF K		C161			CC73GCH1H010B	CHIP C 1.0PF B	E,T
C67			CC73HCH1H040B	CHIP C 4.0PF B	E3	C161			CC73GCH1H030B	CHIP C 3.0PF B	E3
C67			CC73HCH1H050B	CHIP C 5.0PF B	E,T	C162			CC73GCH1H020B	CHIP C 2.0PF B	E,T
C68			CK73HB1H471K	CHIP C 470PF K	E,T	C164			CC73GCH1H030B	CHIP C 3.0PF B	E3
C68,69			CK73HB1H471K	CHIP C 470PF K	E3	C166			CC73GCH1H060B	CHIP C 6.0PF B	E,T
C70			CC73HCH1H0R5B	CHIP C 0.5PF B		C166			CC73GCH1H070B	CHIP C 7.0PF B	E3
C71			CC73HCH1H0R3B	CHIP C 0.3PF B		C167			CK73HB1H471K	CHIP C 470PF K	
C72,73			CK73HB1A104K	CHIP C 0.10UF K		C168			CC73GCH1H040B	CHIP C 4.0PF B	
C74,75			CK73HB1H471K	CHIP C 470PF K		C169			CC73GCH1H2R5B	CHIP C 2.5PF B	
C76			CS77CP0J100M	CHIP TNL 10UF 6.3WV		C170			CC73GCH1H101J	CHIP C 100PF J	
C77			CK73HB1H471K	CHIP C 470PF K		C172			CC73GCH1H010B	CHIP C 1.0PF B	E3
C78			CC73HCH1H300J	CHIP C 30PF J	E3	C172			CC73GCH1H050B	CHIP C 5.0PF B	E,T
C78			CC73HCH1H330J	CHIP C 33PF J	E,T	C173			CC73GCH1H0R5B	CHIP C 0.5PF B	
C79,80			CK73HB1H471K	CHIP C 470PF K		C174			CC73GCH1H060B	CHIP C 6.0PF B	E,T
C81			CC73HCH1H150J	CHIP C 15PF J		C174			CC73GCH1H100C	CHIP C 10PF C	E3
C83-85			CK73HB1H471K	CHIP C 470PF K		C175			CC73GCH1H010B	CHIP C 1.0PF B	
C86			CC73HCH1H100B	CHIP C 10PF B		C176			CC73GCH1H060B	CHIP C 6.0PF B	E,T
C101			CK73HB1H471K	CHIP C 470PF K		C176			CC73GCH1H100C	CHIP C 10PF C	E3
C103			CC73HCH1H120J	CHIP C 12PF J	E3	C177			CC73GCH1H010B	CHIP C 1.0PF B	E3
C104			CC73HCH1H160J	CHIP C 16PF J	E3	C177			CC73GCH1H2R5B	CHIP C 2.5PF B	E,T
C106			CK73GB1A105K	CHIP C 1.0UF K		C178			CC73GCH1H040B	CHIP C 4.0PF B	E,T
C107			CK73HB1H471K	CHIP C 470PF K		C178			CC73GCH1H060B	CHIP C 6.0PF B	E3
C108			CK73GB1A105K	CHIP C 1.0UF K		C201			CK73GB1C224K	CHIP C 0.22UF K	
C109			CC73HCH1H060B	CHIP C 6.0PF B	E,T	C202			CK73FB0J106K	CHIP C 10UF K	
C109			CC73HCH1H180J	CHIP C 18PF J	E3	C203			CK73HB1E103K	CHIP C 0.010UF K	
C111			CK73GB1A105K	CHIP C 1.0UF K	E,T	C204			CK73HB1H102K	CHIP C 1000PF K	
C111			CK73GB0J106M	CHIP C 10UF M	E3	C205			CK73HB1H182K	CHIP C 1800PF K	
C112,113			CK73HB1H471K	CHIP C 470PF K		C206,207			CK73HB1H681K	CHIP C 680PF K	E,T
C114			CK73HB1A104K	CHIP C 0.10UF K		C206,207			CK73HB1H821K	CHIP C 820PF K	E3
C115			CC73HCH1H050B	CHIP C 5.0PF B	E3	C208			CK73HB1A104K	CHIP C 0.10UF K	
C115			CC73HCH1H060B	CHIP C 6.0PF B	E,T	C209			CC73HCH1H680J	CHIP C 68PF J	
C116			CK73HB1H471K	CHIP C 470PF K		C210-213			CK73HB1A104K	CHIP C 0.10UF K	
C117			CC73HCH1H120J	CHIP C 12PF J	E,T	C214			CC73HCH1H020B	CHIP C 2.0PF B	E3
C118			CC73HCH1H090B	CHIP C 9.0PF B	E3	C214			CC73HCH1H110J	CHIP C 11PF J	E,T
C120			CK73HB1H471K	CHIP C 470PF K		C215,216			CK73HB1E103K	CHIP C 0.010UF K	
C123			CC73HCH1H0R5B	CHIP C 0.5PF B	E3	C220			CC73HCH1H180J	CHIP C 18PF J	
C124			CK73HB1H471K	CHIP C 470PF K		C222			CK73HB1H471K	CHIP C 470PF K	



## PARTS LIST

TX-RX UNIT (X57-7582-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C223			CK73HB1E103K	CHIP C 0.010UF K		C307			CC73HCH1H101J	CHIP C 100PF J	
C224			CK73HB1A104K	CHIP C 0.10UF K		C310			CK73GB1A105K	CHIP C 1.0UF K	
C225			CK73HB1E103K	CHIP C 0.010UF K		C311			CC73HCH1H101J	CHIP C 100PF J	
C226			CK73HB1H471K	CHIP C 470PF K		C312			CK73HB1H471K	CHIP C 470PF K	
C227			CC73HCH1H180J	CHIP C 18PF J		C313			CC73HCH1H101J	CHIP C 100PF J	
C228			CK73HB1H471K	CHIP C 470PF K		C315			CC73HCH1H101J	CHIP C 100PF J	
C230			CK73HB1E103K	CHIP C 0.010UF K		C316			CK73HB1H471K	CHIP C 470PF K	
C231			CK73HB1H102K	CHIP C 1000PF K	E3	C318			CK73HB1E103K	CHIP C 0.010UF K	
C231			CK73HB1H471K	CHIP C 470PF K	E,T	C319			CK73HB1H102K	CHIP C 1000PF K	
C232			CC73HCH1H3R5B	CHIP C 3.5PF B		C320			CC73HCH1H101J	CHIP C 100PF J	
C233			CC73HCH1H060B	CHIP C 6.0PF B		C321			CK73GB1A105K	CHIP C 1.0UF K	
C234			CK73HB1H471K	CHIP C 470PF K		C322			CC73HCH1H101J	CHIP C 100PF J	
C235			CC73HCH1HR75B	CHIP C 0.75PF B	E3	C323			CK73GB1A105K	CHIP C 1.0UF K	
C236			CC73GCH1H070B	CHIP C 7.0PF B	E3	C325			CC73HCH1H101J	CHIP C 100PF J	
C236			CC73GCH1H4R5B	CHIP C 4.5PF B	E,T	C327			CK73HB1H471K	CHIP C 470PF K	
C237			CC73HCH1H220J	CHIP C 22PF J	E,T	C331			CK73HB1A104K	CHIP C 0.10UF K	
C237			CC73HCH1H270J	CHIP C 27PF J	E3	C332			CC73HCH1H050B	CHIP C 5.0PF B	
C238			CC73HCH1H010B	CHIP C 1.0PF B		C334			CK73HB1E103K	CHIP C 0.010UF K	
C239			CK73HB1H471K	CHIP C 470PF K		C335			CK73FB0J106K	CHIP C 10UF K	
C240			CC73HCH1H040B	CHIP C 4.0PF B	E3	C337			CC73HCH1H050B	CHIP C 5.0PF B	
C240			CC73HCH1H060B	CHIP C 6.0PF B	E,T	C339			CK73GB1A105K	CHIP C 1.0UF K	
C241			CK73FB0J106K	CHIP C 10UF K		C341			CK73HB1H471K	CHIP C 470PF K	
C242			CC73HCH1H060B	CHIP C 6.0PF B	E,T	C353-355			CK73HB1E103K	CHIP C 0.010UF K	
C242			CC73HCH1H080B	CHIP C 8.0PF B	E3	C356			CK73HB1H102K	CHIP C 1000PF K	
C243			CK73HB1H471K	CHIP C 470PF K		C358			CK73GB1C224K	CHIP C 0.22UF K	
C244			CC73HCH1H220J	CHIP C 22PF J	E,T	C359			CK73FB0J106K	CHIP C 10UF K	
C244			CC73HCH1H270J	CHIP C 27PF J	E3	C360			CK73HB1A104K	CHIP C 0.10UF K	
C245			CC73HCH1H010B	CHIP C 1.0PF B		C361			CK73GB1A105K	CHIP C 1.0UF K	
C246			CK73HB1H471K	CHIP C 470PF K		C362			CK73HB1H471K	CHIP C 470PF K	
C247			CC73HCH1H040B	CHIP C 4.0PF B	E3	C363			CC73HCH1H820J	CHIP C 82PF J	
C247			CC73HCH1H060B	CHIP C 6.0PF B	E,T	C364			CC73HCH1H120J	CHIP C 12PF J	
C248			CC73HCH1H220J	CHIP C 22PF J	E,T	C365			CC73HCH1H820J	CHIP C 82PF J	
C248			CC73HCH1H270J	CHIP C 27PF J	E3	C366			CK73HB1A104K	CHIP C 0.10UF K	
C249			CC73GCH1H080B	CHIP C 8.0PF B	E3	C367			CK73GB1A105K	CHIP C 1.0UF K	
C249			CC73GCH1H4R5B	CHIP C 4.5PF B	E,T	C368			CK73HB1H271K	CHIP C 270PF K	
C250			CK73HB1H471K	CHIP C 470PF K		C369,370			CK73HB1A104K	CHIP C 0.10UF K	
C252-254			CK73HB1H471K	CHIP C 470PF K		C371			CK73FB0J106K	CHIP C 10UF K	
C256			CK73HB1H471K	CHIP C 470PF K		C372			CK73HB1H471K	CHIP C 470PF K	
C257			CC73HCH1H080B	CHIP C 8.0PF B	E3	C373			CC73HCH1H121J	CHIP C 120PF J	
C257			CC73HCH1H3R5B	CHIP C 3.5PF B	E,T	C374			CK73HB1H102K	CHIP C 1000PF K	
C258			CC73HCH1H220J	CHIP C 22PF J		C375,376			CK73HB1H471K	CHIP C 470PF K	
C259			CC73HCH1H030B	CHIP C 3.0PF B		C377			CK73HB1A683K	CHIP C 0.068UF K	
C260			CK73HB1H471K	CHIP C 470PF K		C378			CC73HCH1H820J	CHIP C 82PF J	
C261			CC73HCH1H030B	CHIP C 3.0PF B	E,T	C379,380			CK73GB1A105K	CHIP C 1.0UF K	
C261			CC73HCH1H2R5B	CHIP C 2.5PF B	E3	C381			CK73HB1H391K	CHIP C 390PF K	
C262			CC73HCH1H220J	CHIP C 22PF J		C382			CK73HB1C153K	CHIP C 0.015UF K	
C263			CC73HCH1H010B	CHIP C 1.0PF B	E,T	C383-385			CK73HB1A104K	CHIP C 0.10UF K	
C263			CC73HCH1H060B	CHIP C 6.0PF B	E3	C386			CK73HB1E103K	CHIP C 0.010UF K	
C264			CC73HCH1H2R5B	CHIP C 2.5PF B	E3	C388,389			CK73HB1H471K	CHIP C 470PF K	
C264			CC73HCH1H4R5B	CHIP C 4.5PF B	E,T	C390,391			CK73GB1A105K	CHIP C 1.0UF K	
C265			CC73HCH1H030B	CHIP C 3.0PF B	E,T	C392			CK73HB1A473K	CHIP C 0.047UF K	
C265			CC73HCH1H050B	CHIP C 5.0PF B	E3	C393			CK73FB0J106K	CHIP C 10UF K	
C266			CC73HCH1H050B	CHIP C 5.0PF B	E,T	C395			CC73HCH1H221J	CHIP C 220PF J	
C266			CC73HCH1H3R5B	CHIP C 3.5PF B	E3	C396			CK73HB1A104K	CHIP C 0.10UF K	
C290			CC73HCH1H020B	CHIP C 2.0PF B		C397			CK73GB1C474K	CHIP C 0.47UF K	
C291			CC73HCH1H060B	CHIP C 6.0PF B		C399			CC73HCH1H101J	CHIP C 100PF J	
C303			CC73HCH1H101J	CHIP C 100PF J		C400			CK73FB0J106K	CHIP C 10UF K	
C304			CK73HB1A104K	CHIP C 0.10UF K		C402			CK73HB1A104K	CHIP C 0.10UF K	
C305			CC73HCH1H101J	CHIP C 100PF J		C403			CK73HB1A473J	CHIP C 0.047UF J	
C306			CK73GB1A105K	CHIP C 1.0UF K		C404			CS77CC0J101M	CHIP TNL 100UF 6.3WV	

## PARTS LIST

### TX-RX UNIT (X57-7582-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C405			CC73HCH1H221J	CHIP C 220PF J		L209			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)	
C408,409			CK73HB1H471K	CHIP C 470PF K		L210			L41-1585-45	SMALL FIXED INDUCTOR (150NH)	E3
C411			CK73HB1H471K	CHIP C 470PF K	E,T	L210			L41-2785-45	SMALL FIXED INDUCTOR (270NH)	E,T
C413-415			CK73HB1H471K	CHIP C 470PF K		L212,213			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)	
TC1,2			C05-0384-05	CERAMIC TRIMMER CAP (10PF)		L214			L41-4775-45	SMALL FIXED INDUCTOR (47NH)	
CN2,3			E23-1278-05	TERMINAL		L250			L40-1875-71	SMALL FIXED INDUCTOR (18NH)	
CN301			E40-6573-05	FLAT CABLE CONNECTOR		L301			L92-0472-05	CHIP FERRITE	
J301			E11-0703-05	PHONE JACK (2.5/3.5)		L302-304			L92-0138-05	CHIP FERRITE	
102	2A	*	F12-0493-04	CONDUCTIVE SHEET	E,T	L305			L92-0140-05	CHIP FERRITE	
F301			F53-0324-05	FUSE (2.5A)		X1			L77-3042-05	TCXO (12.8MHZ)	
101	2A		J30-1282-14	SPACER		X301			L78-1433-05	RESONATOR (14.746MHZ)	
CD201			L79-1866-05	TUNING COIL		XF201			L71-0637-15	MCF	
CF201	2A		L72-1025-05	CERAMIC FILTER		CP1			RK75HA1J101J	CHIP-COM 100 J 1/16W	
L1			L92-0138-05	CHIP FERRITE		CP201			RK75HA1J104J	CHIP-COM 100K J 1/16W	
L2			L40-4791-86	SMALL FIXED INDUCTOR (4.7UH)		CP202			RK75HA1J474J	CHIP-COM 470K J 1/16W	
L4			L40-5681-86	SMALL FIXED INDUCTOR (0.56UH)		CP203			RK75HA1J104J	CHIP-COM 100K J 1/16W	
L6			L40-5681-86	SMALL FIXED INDUCTOR (0.56UH)		CP204			RK75HA1J474J	CHIP-COM 470K J 1/16W	
L7			L92-0138-05	CHIP FERRITE		CP301,302			RK75HA1J473J	CHIP-COM 47K J 1/16W	
L8			L40-1875-71	SMALL FIXED INDUCTOR (18NH)		CP303,304			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L9			L92-0138-05	CHIP FERRITE	E,T	R1			RK73HB1J223J	CHIP R 22K J 1/16W	
L9			L92-0470-05	CHIP FERRITE	E3	R2			RK73HB1J103J	CHIP R 10K J 1/16W	
L10,11			L40-1885-92	SMALL FIXED INDUCTOR (180NH)		R3			RK73HB1J154J	CHIP R 150K J 1/16W	E3
L12			L40-1875-71	SMALL FIXED INDUCTOR (18NH)		R4			RK73HB1J184J	CHIP R 180K J 1/16W	E,T
L13,14			L40-1885-92	SMALL FIXED INDUCTOR (180NH)		R5			RK73HB1J563J	CHIP R 56K J 1/16W	
L15			L40-2778-67	SMALL FIXED INDUCTOR (27NH)	E,T	R7			RK73HB1J104J	CHIP R 100K J 1/16W	
L15			L40-3378-67	SMALL FIXED INDUCTOR (33NH)	E3	R8			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L16			L40-1878-67	SMALL FIXED INDUCTOR (18NH)	E,T	R9			RK73HB1J101J	CHIP R 100 J 1/16W	
L16			L40-2278-67	SMALL FIXED INDUCTOR (22NH)	E3	R9,10			RK73HB1J821J	CHIP R 820 J 1/16W	E3
L17,18			L41-2785-45	SMALL FIXED INDUCTOR (270NH)		R10			RK73HB1J000J	CHIP R 0.0 J 1/16W	E,T
L19,20			L40-1885-92	SMALL FIXED INDUCTOR (180NH)		R10			RK73HB1J000J	CHIP R 0.0 J 1/16W	E3
L21			L92-0138-05	CHIP FERRITE		R11			RK73HB1J274J	CHIP R 270K J 1/16W	E3
L22,23			L40-2275-71	SMALL FIXED INDUCTOR (22NH)		R11			RK73HB1J684J	CHIP R 680K J 1/16W	E,T
L101			L40-1875-71	SMALL FIXED INDUCTOR (18NH)	E3	R12			RK73HB1J221J	CHIP R 220 J 1/16W	
L102			L40-2775-71	SMALL FIXED INDUCTOR (27NH)	E3	R13			RK73HB1J101J	CHIP R 100 J 1/16W	
L102			L40-3375-71	SMALL FIXED INDUCTOR (33NH)	E,T	R14			RK73HB1J100J	CHIP R 10 J 1/16W	
L103			L40-1575-71	SMALL FIXED INDUCTOR (15NH)	E,T	R15			RK73HB1J561J	CHIP R 560 J 1/16W	
L103			L40-1875-71	SMALL FIXED INDUCTOR (18NH)	E3	R16			RK73HB1J181J	CHIP R 180 J 1/16W	
L104			L40-1068-71	SMALL FIXED INDUCTOR (1.0NH)	E,T	R17			RK73HB1J182J	CHIP R 1.8K J 1/16W	
L104			L40-8265-71	SMALL FIXED INDUCTOR (8.2NH)	E3	R18			RK73HB1J331J	CHIP R 330 J 1/16W	E,T
L105			L41-2278-45	SMALL FIXED INDUCTOR (22NH)	E,T	R18			RK73HB1J391J	CHIP R 390 J 1/16W	E3
L105			L41-1678-45	SMALL FIXED INDUCTOR (16NH)	E3	R19			RK73HB1J223J	CHIP R 22K J 1/16W	
L106			L92-0472-05	CHIP FERRITE		R20			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L107			L40-2263-92	SMALL FIXED INDUCTOR (2.2NH)	E3	R21,22			RK73HB1J103J	CHIP R 10K J 1/16W	
L107			L40-2763-92	SMALL FIXED INDUCTOR (2.7NH)	E,T	R23			RK73HB1J470J	CHIP R 47 J 1/16W	E3
L108			L34-4603-15	AIR-CORE COIL		R26			RK73HB1J333J	CHIP R 33K J 1/16W	
L109			L92-0472-05	CHIP FERRITE		R27			RK73HB1J684J	CHIP R 680K J 1/16W	
L111			L41-2785-45	SMALL FIXED INDUCTOR (270NH)		R28			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L112			L34-4572-05	AIR-CORE COIL		R29			RK73HB1J154J	CHIP R 150K J 1/16W	
L113-115			L34-4564-05	AIR-CORE COIL		R30			RK73HB1J273J	CHIP R 27K J 1/16W	
L116			L41-1092-44	SMALL FIXED INDUCTOR (1UH)		R31			RK73HB1J274J	CHIP R 270K J 1/16W	
L201			L40-1091-86	SMALL FIXED INDUCTOR (1.0UH)		R32			RK73HB1J394J	CHIP R 390K J 1/16W	E3
L202			L92-0138-05	CHIP FERRITE		R32			RK73HB1J474J	CHIP R 470K J 1/16W	E,T
L203			L41-5685-39	SMALL FIXED INDUCTOR (0.56UH)		R33			RK73HB1J100J	CHIP R 10 J 1/16W	E3
L204			L40-1585-92	SMALL FIXED INDUCTOR (150NH)	E,T	R33,34			RK73HB1J101J	CHIP R 100 J 1/16W	E,T
L204			L40-8275-92	SMALL FIXED INDUCTOR (82NH)	E3	R34			RK73HB1J101J	CHIP R 100 J 1/16W	E3
L205			L40-2775-71	SMALL FIXED INDUCTOR (27NH)		R35			RK73HB1J560J	CHIP R 56 J 1/16W	
L206,207			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)		R36			RK73HB1J101J	CHIP R 100 J 1/16W	
L208			L92-0138-05	CHIP FERRITE		R37			RK73HB1J392J	CHIP R 3.9K J 1/16W	E3
						R37			RK73HB1J472J	CHIP R 4.7K J 1/16W	E,T

## PARTS LIST

TX-RX UNIT (X57-7582-XX)

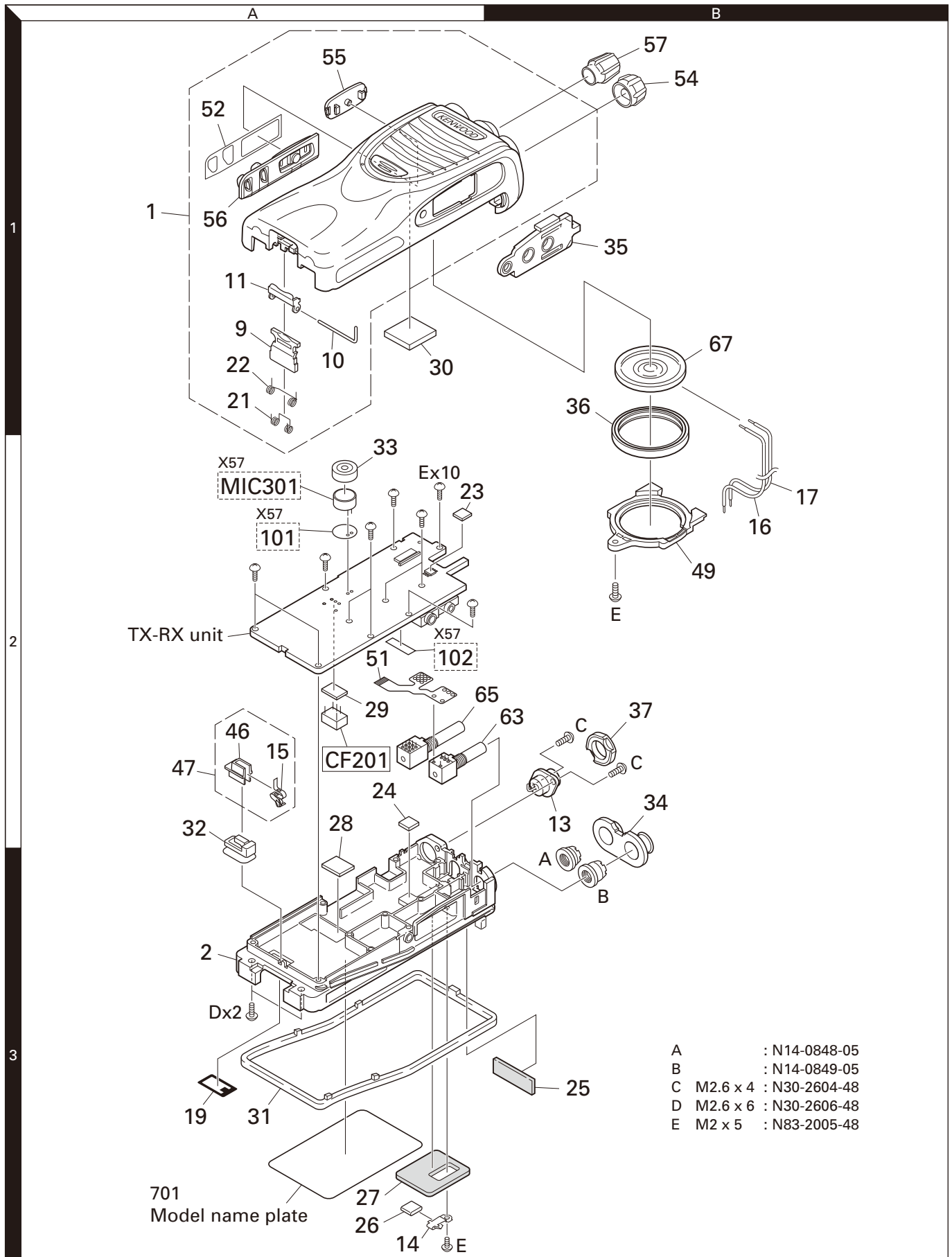
Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
R38			RK73HB1J154J	CHIP R 150K J 1/16W		R212			RK73HB1J224J	CHIP R 220K J 1/16W	E,T
R39			RK73HB1J101J	CHIP R 100 J 1/16W		R213			RK73HB1J391J	CHIP R 390 J 1/16W	
R41			RK73HB1J562J	CHIP R 5.6K J 1/16W		R214			RK73HB1J101J	CHIP R 100 J 1/16W	E3
R42			RK73HB1J220J	CHIP R 22 J 1/16W	E,T	R214			RK73HB1J331J	CHIP R 330 J 1/16W	E,T
R42			RK73HB1J470J	CHIP R 47 J 1/16W	E3	R215			RK73HB1J102J	CHIP R 1.0K J 1/16W	E,T
R43			RK73HB1J471J	CHIP R 470 J 1/16W		R215			RK73HB1J222J	CHIP R 2.2K J 1/16W	E3
R45			RK73HB1J562J	CHIP R 5.6K J 1/16W		R216			RK73HB1J101J	CHIP R 100 J 1/16W	E,T
R101			RK73HB1J332J	CHIP R 3.3K J 1/16W		R216			RK73HB1J820J	CHIP R 82 J 1/16W	E3
R102			RK73HB1J273J	CHIP R 27K J 1/16W		R217			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R103			RK73HB1J331J	CHIP R 330 J 1/16W		R218			RK73HB1J563J	CHIP R 56K J 1/16W	E3
R104			RK73HB1J560J	CHIP R 56 J 1/16W		R218,219			RK73HB1J563J	CHIP R 56K J 1/16W	E,T
R105			RK73HB1J183J	CHIP R 18K J 1/16W	E3	R219			RK73HB1J473J	CHIP R 47K J 1/16W	E3
R105			RK73HB1J333J	CHIP R 33K J 1/16W	E,T	R220			RK73HB1J000J	CHIP R 0.0 J 1/16W	E3
R106			RK73HB1J331J	CHIP R 330 J 1/16W		R220			RK73HB1J470J	CHIP R 47 J 1/16W	E,T
R107			RK73HB1J560J	CHIP R 56 J 1/16W	E3	R221			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R107			RK73HB1J680J	CHIP R 68 J 1/16W	E,T	R222			RK73HB1J101J	CHIP R 100 J 1/16W	E3
R108			RK73HB1J152J	CHIP R 1.5K J 1/16W	E3	R222			RK73HB1J390J	CHIP R 39 J 1/16W	E,T
R108			RK73HB1J821J	CHIP R 820 J 1/16W	E,T	R223			RK73HB1J101J	CHIP R 100 J 1/16W	E,T
R109			RK73HB1J150J	CHIP R 15 J 1/16W	E3	R223			RK73HB1J820J	CHIP R 82 J 1/16W	E3
R109			RK73HB1J220J	CHIP R 22 J 1/16W	E,T	R224			RK73HB1J684J	CHIP R 680K J 1/16W	E3
R110			RK73HB1J152J	CHIP R 1.5K J 1/16W	E3	R225			RK73HB1J563J	CHIP R 56K J 1/16W	E3
R110			RK73HB1J821J	CHIP R 820 J 1/16W	E,T	R225			RK73HB1J683J	CHIP R 68K J 1/16W	E,T
R111			RK73HB1J473J	CHIP R 47K J 1/16W		R226			RK73HB1J000J	CHIP R 0.0 J 1/16W	E3
R112			RK73HB1J220J	CHIP R 22 J 1/16W		R226			RK73HB1J220J	CHIP R 22 J 1/16W	E,T
R113			RK73HB1J123J	CHIP R 12K J 1/16W		R227			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R114			RK73HB1J822J	CHIP R 8.2K J 1/16W		R228			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R116			RK73HB1J331J	CHIP R 330 J 1/16W	E,T	R301			RK73HB1J474D	CHIP R 470K D 1/16W	
R119			RK73GB2A000J	CHIP R 0.0 J 1/10W		R302			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R120			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R303			RK73HB1J101J	CHIP R 100 J 1/16W	
R121			RK73HB1J153J	CHIP R 15K J 1/16W		R304			RK73HB1J334J	CHIP R 330K J 1/16W	
R122			RK73HB1J183J	CHIP R 18K J 1/16W		R305			RK73HB1J474D	CHIP R 470K D 1/16W	
R123			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R306			RK73HB1J184J	CHIP R 180K J 1/16W	
R124			RK73HB1J101J	CHIP R 100 J 1/16W	E3	R307			RK73GB2A271J	CHIP R 270 J 1/10W	
R124			RK73HB1J220J	CHIP R 22 J 1/16W	E,T	R308			RK73GB2A221J	CHIP R 220 J 1/10W	
R125			RK73HB1J683J	CHIP R 68K J 1/16W		R309,310			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R126			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R313			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R127,128			RK73GH2A154D	CHIP R 150K D 1/10W		R314,315			RK73HB1J103J	CHIP R 10K J 1/16W	
R129,130			RK73GH2A334D	CHIP R 330K D 1/10W		R316			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R131			RK73HB1J105J	CHIP R 1.0M J 1/16W		R317			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R132			RK73HB1J473J	CHIP R 47K J 1/16W		R318			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R133			RK73HB1J000J	CHIP R 0.0 J 1/16W		R319			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R134			RK73HB1J563J	CHIP R 56K J 1/16W		R320			RK73HB1J123J	CHIP R 12K J 1/16W	
R135			RK73HB1J104J	CHIP R 100K J 1/16W		R321			RK73HB1J103J	CHIP R 10K J 1/16W	
R136			RK73HB1J474J	CHIP R 470K J 1/16W		R322,323			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R137			RK73FB2B000J	CHIP R 0.0 J 1/8W		R324,325			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R138			RK73GB2A151J	CHIP R 150 J 1/10W		R340-342			RK73HB1J103J	CHIP R 10K J 1/16W	
R140			RK73GB2A000J	CHIP R 0.0 J 1/10W		R344			RK73HB1J474J	CHIP R 470K J 1/16W	
R150			RK73HB1J000J	CHIP R 0.0 J 1/16W	E,T	R345			RK73HB1J273J	CHIP R 27K J 1/16W	
R201			RK73HB1J184J	CHIP R 180K J 1/16W		R347			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R203			RK73HB1J472J	CHIP R 4.7K J 1/16W		R348			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R204			RK73HB1J100J	CHIP R 10 J 1/16W		R349			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R205			RK73HB1J823J	CHIP R 82K J 1/16W		R350			RK73HB1J124J	CHIP R 120K J 1/16W	
R206			RK73HB1J272J	CHIP R 2.7K J 1/16W		R351			RK73HB1J334J	CHIP R 330K J 1/16W	
R207			RK73HB1J332J	CHIP R 3.3K J 1/16W		R352			RK73HB1J154J	CHIP R 150K J 1/16W	
R208			RK73HB1J823J	CHIP R 82K J 1/16W		R353			RK73HB1J123J	CHIP R 12K J 1/16W	
R209			RK73HB1J332J	CHIP R 3.3K J 1/16W		R354			RK73HB1J334J	CHIP R 330K J 1/16W	
R210			RK73HB1J392J	CHIP R 3.9K J 1/16W	E,T	R355			RK73HB1J124J	CHIP R 120K J 1/16W	
R210			RK73HB1J472J	CHIP R 4.7K J 1/16W	E3	R356			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R211			RK73HB1J101J	CHIP R 100 J 1/16W		R357			RK73HB1J563J	CHIP R 56K J 1/16W	
R212			RK73HB1J124J	CHIP R 120K J 1/16W	E3	R358			RK73HB1J474J	CHIP R 470K J 1/16W	

## PARTS LIST

## TX-RX UNIT (X57-7582-XX)

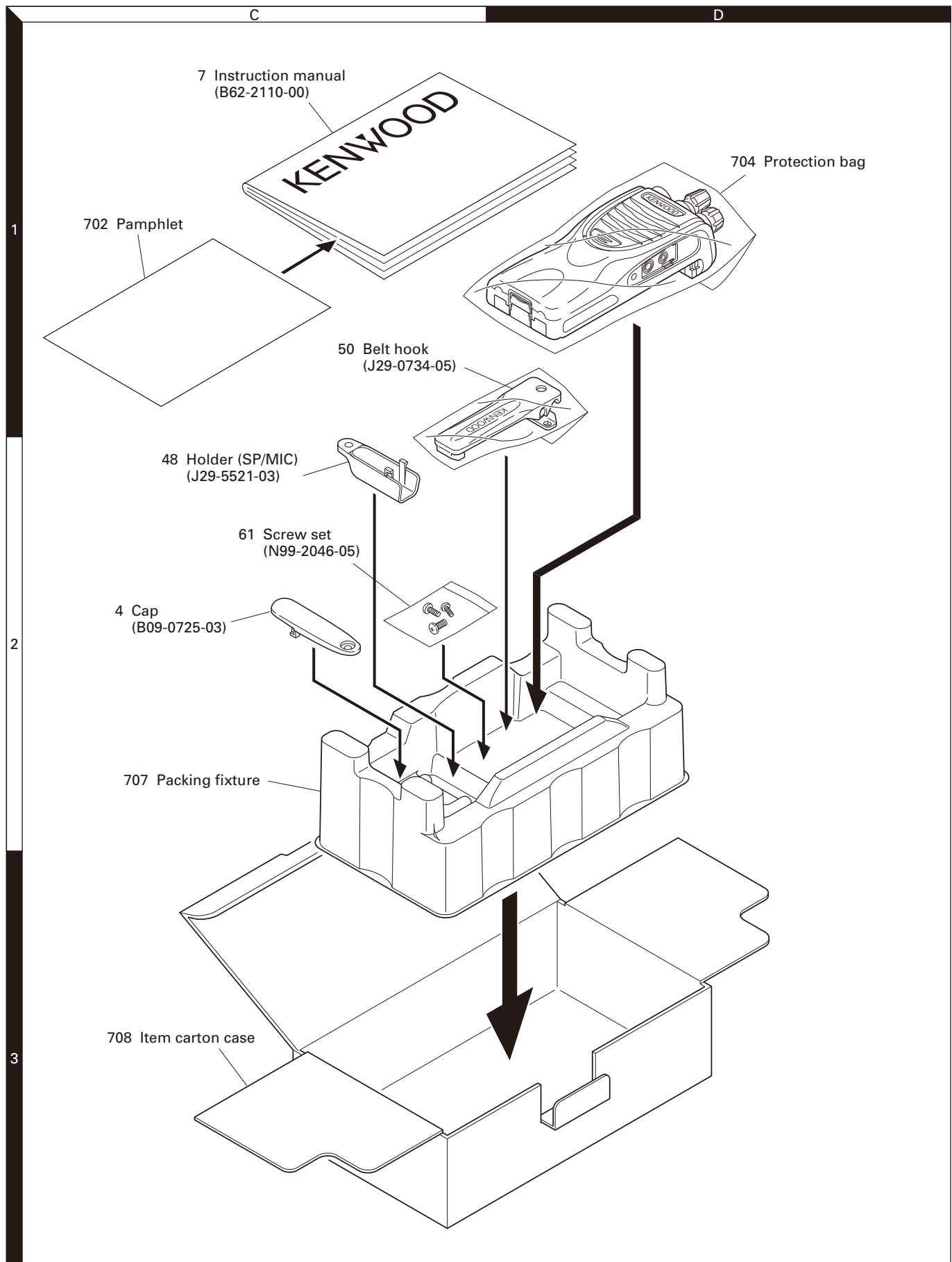
Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
R359			RK73HB1J473J	CHIP R 47K J 1/16W		IC304			XC6209B502MR	MOS-IC	
R360			RK73HB1J562J	CHIP R 5.6K J 1/16W		IC305			BR24L16F-W	ROM IC	
R361			RK73GB2A000J	CHIP R 0.0 J 1/10W		IC306			R5F212CCKCMC	MICRO CONTROL UNIT	
R362			RK73HB1J184J	CHIP R 180K J 1/16W		IC308			AQUA-L	MOS-IC	
R363,364			RK73HB1J104J	CHIP R 100K J 1/16W		IC309			TA7368FG	MOS-IC	
R365			RK73HB1J332J	CHIP R 3.3K J 1/16W		Q1			KTC4075E(Y,GR)	TRANSISTOR	
R366			RK73HB1J154J	CHIP R 150K J 1/16W		Q2			2SC4774	TRANSISTOR	
R367			RK73HB1J393J	CHIP R 39K J 1/16W		Q3			2SC5636	TRANSISTOR	
R368			RK73GB2A000J	CHIP R 0.0 J 1/10W		Q4,5			2SK1875-F(V)	FET	
R369			RK73HB1J823J	CHIP R 82K J 1/16W		Q6			KTC4075E(Y,GR)	TRANSISTOR	
R370			RK73HB1J102J	CHIP R 1.0K J 1/16W		Q7,8			RT1P430U	TRANSISTOR	
R371			RK73HB1J822J	CHIP R 8.2K J 1/16W		Q9			2SC5636	TRANSISTOR	
R372			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q10			KTC4075E(Y,GR)	TRANSISTOR	
R373			RK73HB1J224J	CHIP R 220K J 1/16W		Q11			2SC5636	TRANSISTOR	
R374			RK73HB1J153J	CHIP R 15K J 1/16W		Q101			2SC5636	TRANSISTOR	
R375			RK73HB1J182J	CHIP R 1.8K J 1/16W		Q102			2SC5455-A	TRANSISTOR	
R376			RK73HB1J471J	CHIP R 470 J 1/16W		Q103			RD01MUS1-T113	FET	
R377			RK73HB1J473J	CHIP R 47K J 1/16W		Q106			RD07MVS1BT122	FET	
R378			RK73HB1J561J	CHIP R 560 J 1/16W		Q107			RT1N441U	TRANSISTOR	
R379			RK73HB1J102J	CHIP R 1.0K J 1/16W		Q108			2SK1824-A	FET	
R380			RK73HB1J474J	CHIP R 470K J 1/16W		Q109			RT1P441U	TRANSISTOR	
R381			RK73HB1J151J	CHIP R 150 J 1/16W		Q201			RT1P441U	TRANSISTOR	
R383			RK73HB1J563J	CHIP R 56K J 1/16W		Q202			2SC4774	TRANSISTOR	
R384			RK73HB1J333J	CHIP R 33K J 1/16W		Q203,204			3SK318	FET	
R385			RK73GB2A101J	CHIP R 100 J 1/10W		Q301,302			RT1N441U	TRANSISTOR	
R387			RK73HB1J104J	CHIP R 100K J 1/16W		Q303			RT1P141U	TRANSISTOR	
R388			RK73HB1J101J	CHIP R 100 J 1/16W		Q304			DTB723YE	DIGITAL TRANSISTOR	
R389			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q305,306			2SC4919	TRANSISTOR	
R390			RK73GB2A000J	CHIP R 0.0 J 1/10W		Q307			RT1N441U	TRANSISTOR	
R391			RK73HB1J102J	CHIP R 1.0K J 1/16W		Q308			KTC4075E(Y,GR)	TRANSISTOR	
R393			RK73GB2A000J	CHIP R 0.0 J 1/10W		Q310			2SC4116(GR)F	TRANSISTOR	
R394			RK73HB1J473J	CHIP R 47K J 1/16W		Q311			2SA1586(Y,GR)F	TRANSISTOR	
R398			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q312			RT1N441U	TRANSISTOR	
VR1			R32-0736-05	SEMI FIXED VARIABLE RESISTOR		Q313			2SB1694	TRANSISTOR	
S1-3			S70-0414-05	TACT SWITCH		Q314			RT1N441U	TRANSISTOR	
MIC301	2A		T91-0651-15	MIC ELEMENT		Q315,316			2SK3577-A	FET	
D2			HVC376B	VARIABLE CAPACITANCE DIODE	E3	TH101			B57331V2104J	THERMISTOR	
D3,4			1SV325F	VARIABLE CAPACITANCE DIODE	E,T	TH201			B57331V2104J	THERMISTOR	
D4			1SV325F	VARIABLE CAPACITANCE DIODE	E3						
D6			1SV325F	VARIABLE CAPACITANCE DIODE							
D8			1SV325F	VARIABLE CAPACITANCE DIODE							
D9			KDV214E-P	DIODE							
D10			MC2858	DIODE							
D101			UDZW5.1(B)	ZENER DIODE							
D103			HSC277	DIODE							
D104			HVC131	DIODE							
D106			HVC131	DIODE							
D201-205			HVC355B	VARIABLE CAPACITANCE DIODE							
D301			GN1G	DIODE							
D302			HRC0203C	DIODE							
D306			KDR731	DIODE							
D307			MC2850	DIODE							
D308,309			KDR731	DIODE							
IC1			MB15A02PFV2E1	MOS-IC							
IC101			BA2904FVM	MOS-IC							
IC201			TA31136FNG	MOS-IC							
IC301			BD4840FVE	MOS-IC							
IC303			XC6209B502PR	MOS-IC							

## EXPLODED VIEW

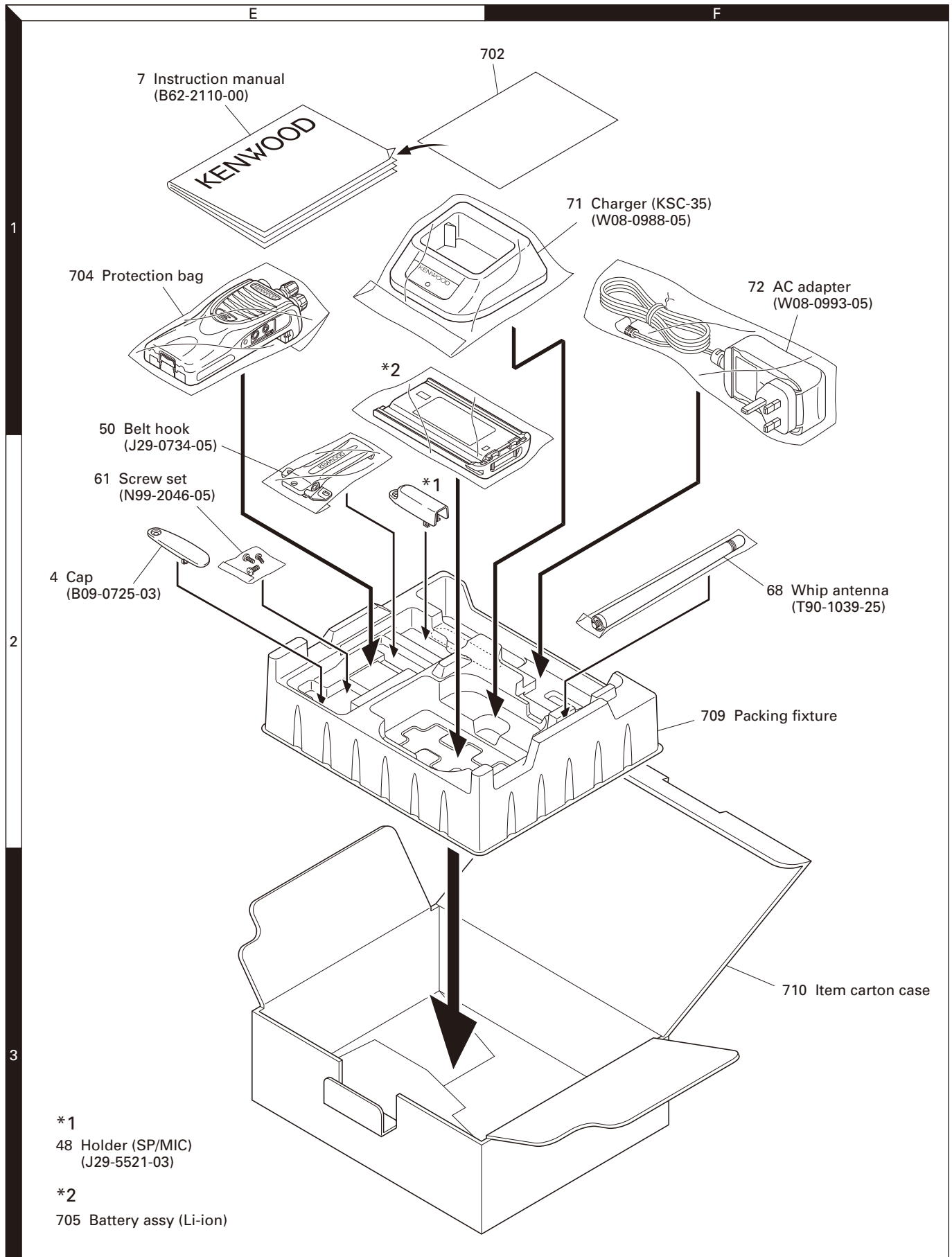


Parts with the exploded numbers larger than 700 are not supplied.  
 If a part reference number is listed in a box on the exploded view of the PCB, that part does not come with the PCB.  
 These parts must be ordered separately.

## PACKING (E,E3 TYPE)



## PACKING (T TYPE)



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

## ADJUSTMENT

### Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range Modulation Output	Operational frequency range of the transceiver Frequency modulation and external modulation -127dBm/0.1μV to greater than -47dBm/1mV
2. RF Power Meter	Input Impedance Operation Frequency Measurement Range	50Ω Operational frequency range of the transceiver Vicinity of 10W
3. Deviation Meter	Frequency Range	Operational frequency range of the transceiver
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. DC 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. Spectrum Analyzer	Measuring Range	DC to 1GHz or more
12. Tracking Generator	Center frequency Output Voltage	50kHz to 600MHz 100mV or more
13. 8Ω Dummy Load		Approx. 8Ω, 3W
14. Regulated Power Supply		5V to 10V, approx. 3A Useful if ammeter equipped

#### ■ Antenna connector adapter

The antenna connector of this transceiver uses an SMA terminal.

Use an antenna connector adapter [SMA(f) – BNC(f) or SMA(f) – N(f)] for adjustment. (The adapter is not provided as an option, so buy a commercially-available one.)

#### ■ Repair Jig (Chassis)

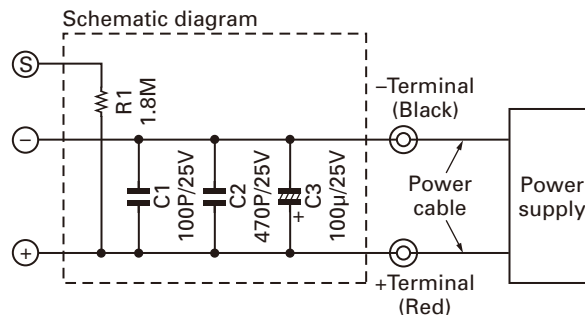
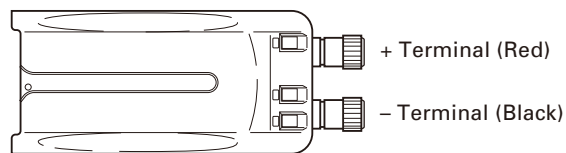
Use jig (part No.: A10-4215-03) for repairing the transceiver. Place the TX-RX unit on the jig and fit it with screws.

The jig facilitates the voltage check and protects the final amplifier FET when the voltage on the flow side of the TX-RX unit is checked during repairs.

#### ■ Battery Jig (W05-1011-00)

Connect the power cable properly between the battery jig installed in the transceiver and the power supply, and be sure output voltage and the power supply polarity prior to switching the power supply ON, otherwise over voltage and reverse connection may damage the transceiver, or the power supply or both.

**Note:** When using the battery jig, you must measure the voltage at the terminals of the battery jig. Otherwise, a slight voltage drop may occur within the power cable, between the power supply and the battery jig, especially while the transceiver transmits.





## ADJUSTMENT

### Frequency and Signaling

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

#### ■ Frequency (MHz)

##### • TK-3302 E,T

Channel No.	RX Frequency	TX Frequency
1	455.050	455.100
2	440.050	440.100
3	469.950	469.900
4	455.000	455.000
5	455.200	455.200
6	455.400	455.400
7~16	-	-

##### • TK-3302 E3

Channel No.	RX Frequency	TX Frequency
1	415.050	415.100
2	400.050	400.100
3	429.950	429.900
4	415.000	415.000
5	415.200	415.200
6	415.400	415.400
7~16	-	-

#### ■ Signaling

Signaling No.	RX	TX
1	None	None
2	None	100Hz Square Wave
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 250.3Hz	QT 250.3Hz
6	DQT D023N	DQT D023N
7	DQT D754I	DQT D754I

### Preparations for Tuning the Transceiver

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

Whenever the transmitter is tuned, 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.

#### ■ Adjustment frequency

TEST CH	TK-3302 E,T	
	RX	TX
Center	455.050MHz	455.100MHz
Low	440.050MHz	440.100MHz
High	469.950MHz	469.900MHz
Low'	447.550MHz	447.600MHz
High'	462.550MHz	462.600MHz

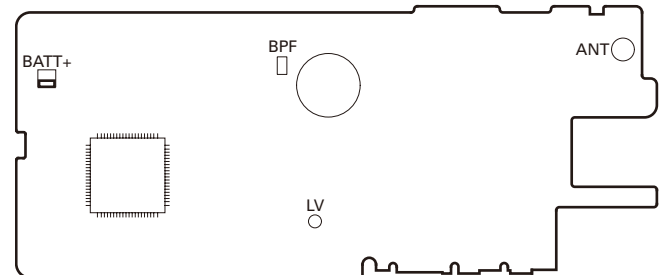
TEST CH	TK-3302 E3	
	RX	TX
Center	415.050MHz	415.100MHz
Low	400.050MHz	400.100MHz
High	429.950MHz	429.900MHz
Low'	407.550MHz	407.600MHz
High'	422.550MHz	422.600MHz

#### ■ List of FPU for transceiver

Model	Type	FPU
TK-3302	E, E3, T	KPG-119D(M2)

### Adjustment Points

#### ■ Component side view

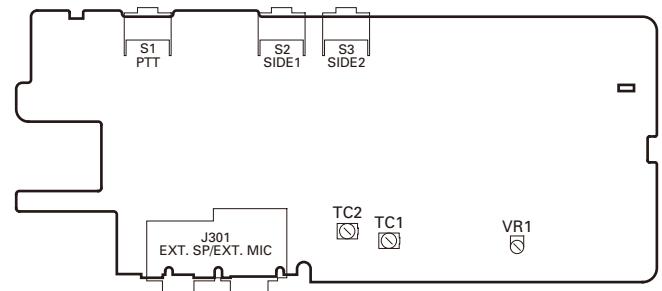


BPF: BPF Wave Adjust

LV (CV): VCO lock voltage

BATT+: Battery Warning Level

#### ■ Foil side view

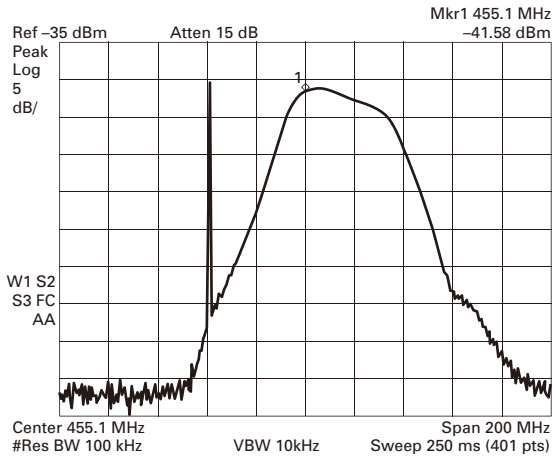


TC1 : VCO lock voltage (RX)

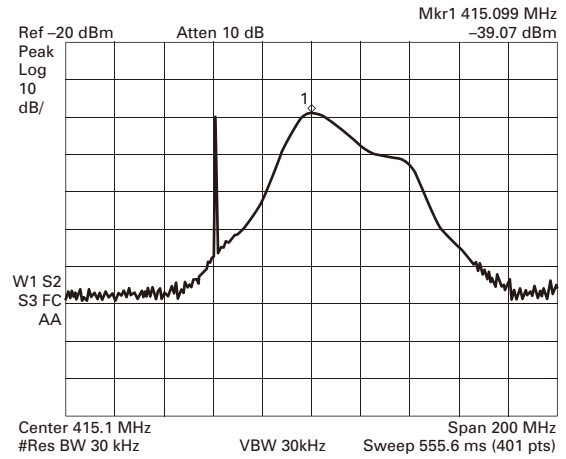
TC2 : VCO lock voltage (TX)

VR1 : Frequency adjustment

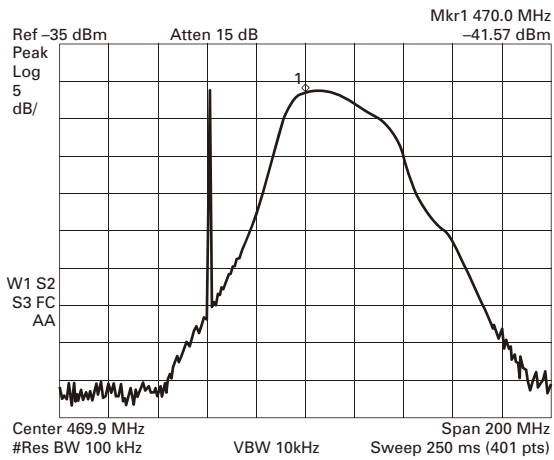
## ADJUSTMENT



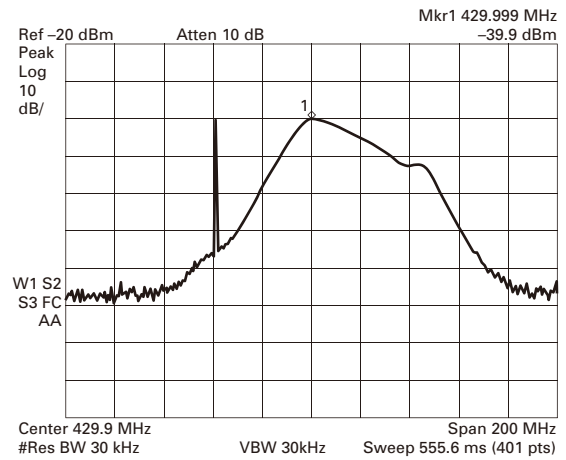
**Fig. 1 Center frequency: E,T**



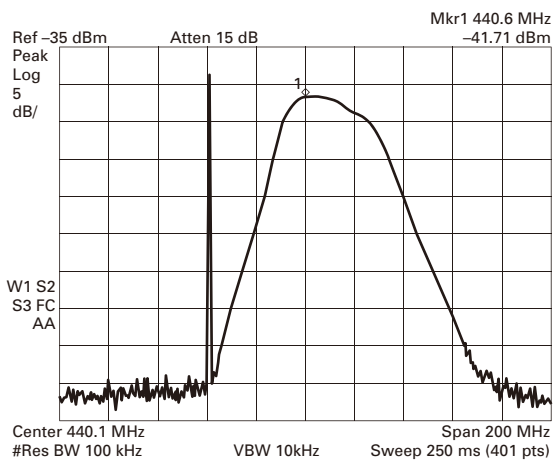
**Fig. 4 Center frequency: E3**



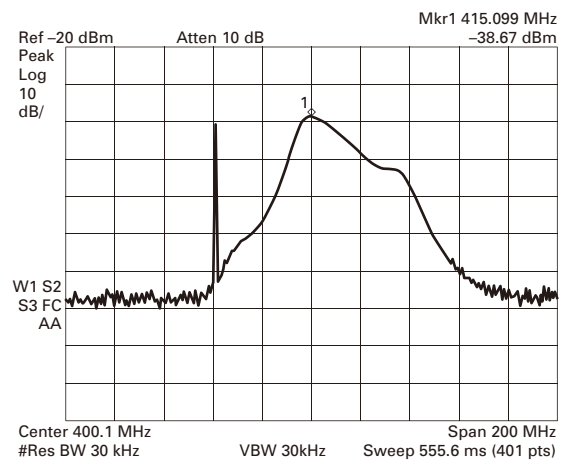
**Fig. 2 High-edge frequency: E,T**



**Fig. 5 High-edge frequency: E3**



**Fig. 3 Low-edge frequency: E,T**




**Fig. 6 Low-edge frequency: E3**

## ADJUSTMENT

## Common Section (Note: The E3 market do not perform "Wide 4k" adjustment.)

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) BATT terminal votage: 7.5V 2) SSG standard modulation [Wide 5k] MOD: 1kHz, DEV: 3kHz [Wide 4k] MOD: 1kHz, DEV: 2.4kHz [Narrow] MOD: 1kHz, DEV: 1.5kHz							
2. VCO lock voltage RX	1) CH: High	Power meter DVM	TX-RX	ANT	TX-RX	TC1	4.0V <b>E,T</b> 3.8V <b>E3</b>	±0.1V
	2) CH: Low			LV (CV)			Check	0.6V or more
3. VCO lock voltage TX	3) CH: High PTT: ON				TX-RX	TC2	3.0V <b>E,T</b> 3.8V <b>E3</b>	±0.1V
	4) CH: Low PTT: ON						Check	0.6V or more

## Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks		
		Test-equipment	Unit	Terminal	Unit	Parts	Method			
1. Frequency Adjust	1) CH: High PTT: ON	f. counter		ANT	TX-RX	VR1	High frequency	±50Hz		
2. High Transmit Power	1) TEST CH: Low, Low', Center, High', High (5 points) BATT terminal voltage: 7.5V PTT: ON	Power meter Ammeter				FPU		4.0W±0.1W 2.0A or less		
3. Low Transmit Power	1) TEST CH: Low, Low', Center, High', High (5 points) BATT terminal voltage: 7.5V PTT: ON							1.0W±0.1W 1.0A or less		
4. Maximum Deviation [Wide 5k]	1) TEST CH: Center, Low, High (3 points) AG: 1kHz/150mV Deviation meter filter LPF: 15kHz HPF: OFF PTT: ON	Power meter Deviation meter Oscilloscope  AG AF VTVM		ANT				4.2kHz (According to the larger +, -)	±80Hz	
	[Wide 4k]			2) TEST CH: Center PTT: ON				SP/MIC connector	3.3kHz (According to the larger +, -)	±80Hz
	[Narrow]			3) TEST CH: Center PTT: ON				2.1kHz (According to the larger +, -)	±80Hz	
5. DQT Balance [Wide 5k]	1) TEST CH: Center, Low, High (3 points) Deviation meter filter LPF: 3kHz HPF: OFF PTT: ON						Make the demodulation wave into square waves.			
	[Wide 4k]								2) TEST CH: Center PTT: ON	
	[Narrow]								3) TEST CH: Center PTT: ON	

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. QT Fine Deviation [Wide 5k]	1) TEST CH: Center, Low, High (3 points) Deviation meter filter LPF: 3kHz HPF: OFF PTT: ON	Power meter Deviation meter Oscilloscope		ANT		FPU	0.75kHz	±40Hz
	[Wide 4k]	2) TEST CH: Center PTT: ON	AG AF VTVM	SP/MIC connector			0.60kHz	±40Hz
	[Narrow]	3) TEST CH: Center PTT: ON					0.38kHz	±40Hz
7. DQT Fine Deviation [Wide 5k]	1) TEST CH: Center, Low, High (3 points) Deviation meter filter LPF: 3kHz HPF: OFF PTT: ON						0.75kHz	±40Hz
	[Wide 4k]	2) TEST CH: Center PTT: ON					0.60kHz	±40Hz
	[Narrow]	3) TEST CH: Center PTT: ON					0.38kHz	±40Hz

## Receiver Section

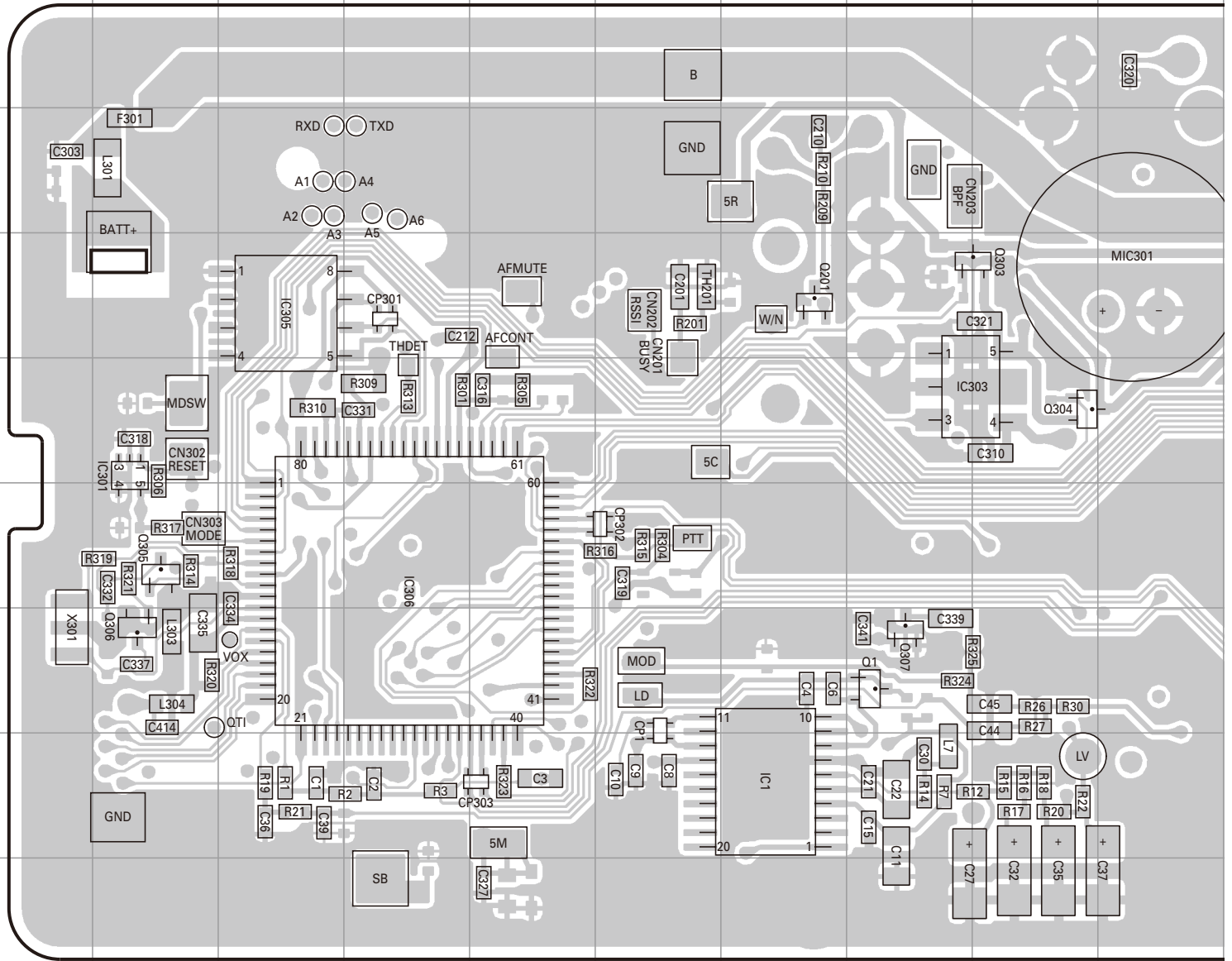
Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. BPF Wave Adjust <b>E,T</b>	1) Center frequency Spectrum analyzer setting Center-f: 455MHz Span: 200MHz RBW: 100kHz VBW: 10kHz ATT: 15dB	SOG		ANT		FPU	Adjust the waveform as shown to the Fig. 1~3.	
	2) High-edge frequency Spectrum analyzer setting Center-f: 470MHz	Spectrum analyzer	TX-RX	BPF				
<b>E3</b>	3) Low-edge frequency Spectrum analyzer setting Center-f: 440MHz						Adjust the waveform as shown to the Fig. 4~6.	
	1) Center frequency Spectrum analyzer setting Center-f: 415MHz Span: 200MHz RBW: 30kHz VBW: 30kHz ATT: 10dB							
	2) High-edge frequency Spectrum analyzer setting Center-f: 430MHz							
	3) Low-edge frequency Spectrum analyzer setting Center-f: 400MHz							

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
2. Sensitivity [Wide 5k]	1) TEST CH: Low, Center, High (3 points) SSG output : -110dBm (0.7μV) SSG MOD: 3.0kHz	SSG  DVM Oscilloscope AF VTVM		ANT  SP/MIC connector			Check	20dB SINAD or more
[Wide 4k]	2) TEST CH: Center SSG output : -110dBm (0.7μV) SSG MOD: 2.4kHz							
[Narrow]	3) TEST CH: Center SSG output : -110dBm (0.7μV) SSG MOD: 1.5kHz							
3. Squelch Open [Wide 5k]	1) TEST CH: Center, Low, High (3 points) SSG output : -121dBm (0.2μV) SSG MOD: 3.0kHz					FPU	Write	
[Wide 4k]	2) TEST CH: Center SSG output : -121dBm (0.2μV) SSG MOD: 2.4kHz							
[Narrow]	3) TEST CH: Center SSG output : -120dBm (0.22μV) SSG MOD: 1.5kHz							
4. Squelch Tight [Wide 5k]	1) TEST CH: Center, Low, High (3 points) SSG output : -115dBm (0.4μV) SSG MOD: 3.0kHz							
[Wide 4k]	2) TEST CH: Center SSG output : -115dBm (0.4μV) SSG MOD: 2.4kHz							
[Narrow]	3) TEST CH: Center SSG output : -114dBm (0.44μV) SSG MOD: 1.5kHz							
5. Battery Warning Level	1) BATT terminal voltage: 5.9V	SSG DVM	TX-RX	ANT BATT terminal			Write	BATT terminal voltage: 5.9V

# TK-3302 PC BOARD

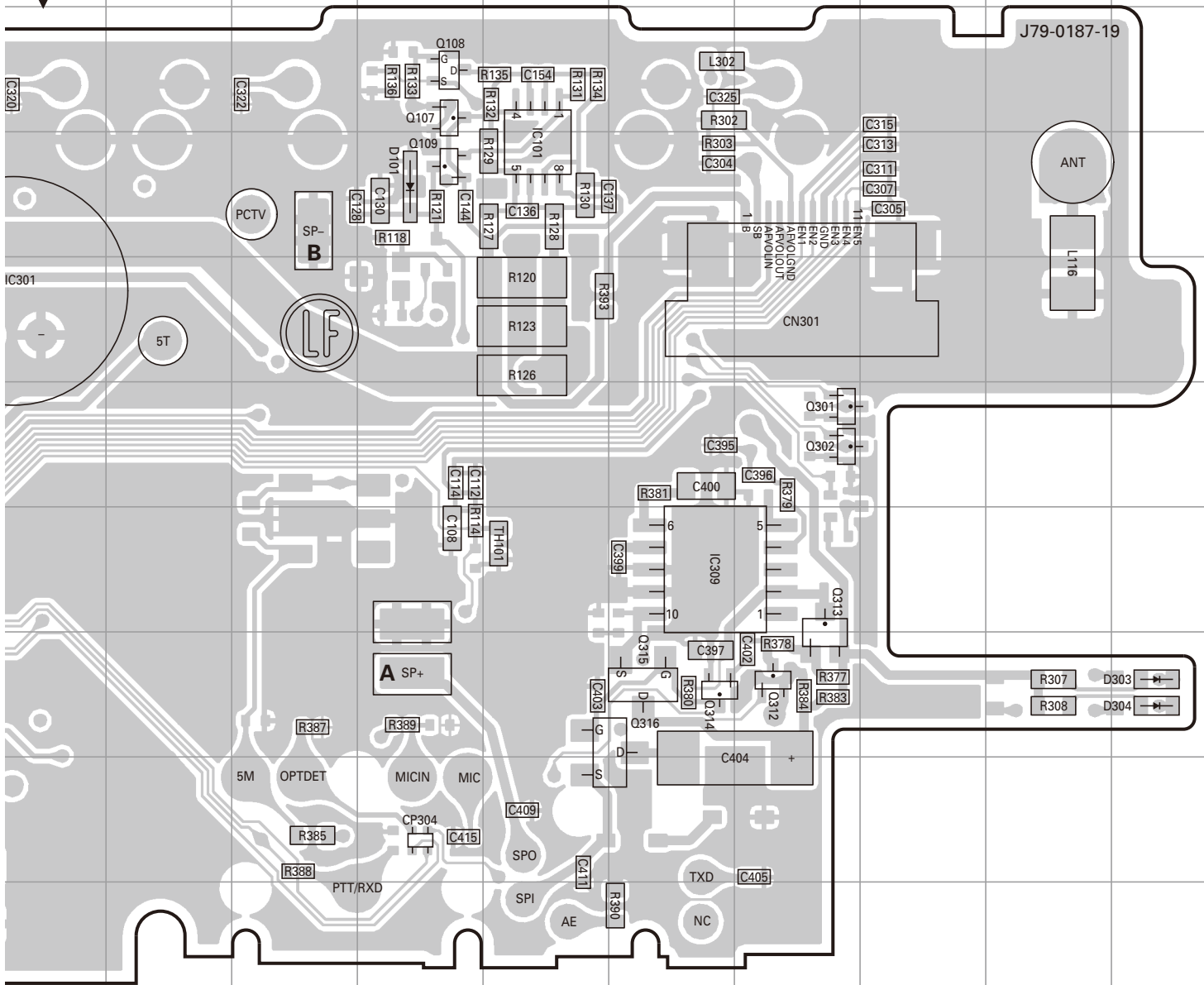
**TX-RX UNIT (X57-7582-XX) -71: E,T -72: E3**  
**Component side view (J79-0187-19)**



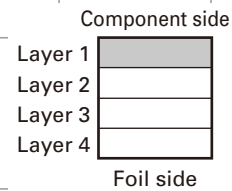
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	9G	Q107	3M	Q305	7B	D101	4M
IC101	4N	Q108	3M	Q306	8B	D303	8S
IC301	6B	Q109	4M	Q307	8H	D304	8S
IC303	6H	Q201	5G	Q312	8P		
IC305	5C	Q301	6P	Q313	7P		
IC306	7D	Q302	6P	Q314	8O		
IC309	7O	Q303	5I	Q315	8O		
Q1	8H	Q304	6I	Q316	8O		

# PC BOARD TK-3302

**TX-RX UNIT (X57-7582-XX) -71: E,T -72: E3  
Component side view (J79-0187-19)**

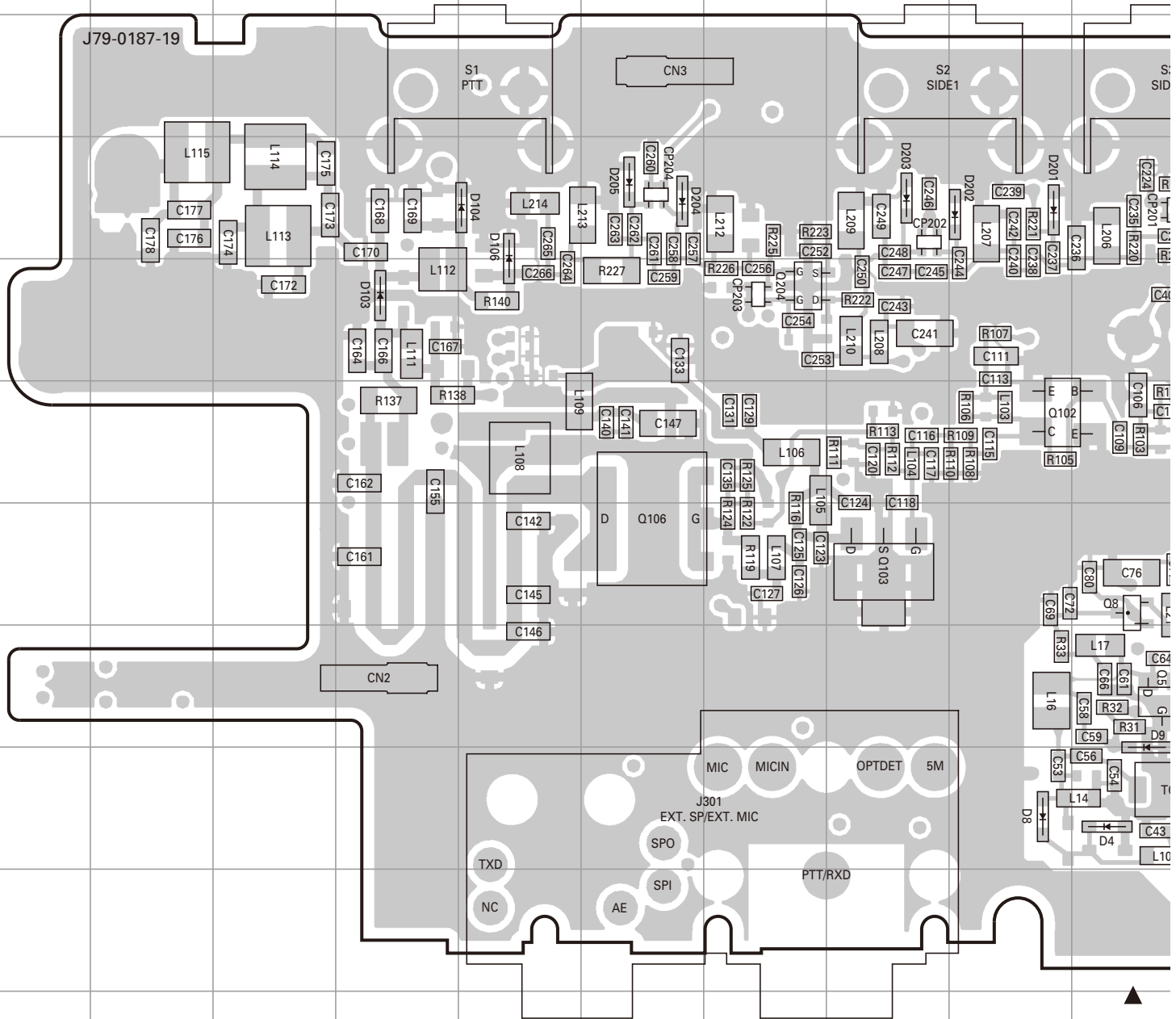


**A: Green speaker wire soldering position.  
B: Brown speaker wire soldering position.**



# TK-3302 PC BOARD

**TX-RX UNIT (X57-7582-XX) -71: E,T -72: E3**  
**Foil side view (J79-0187-19)**

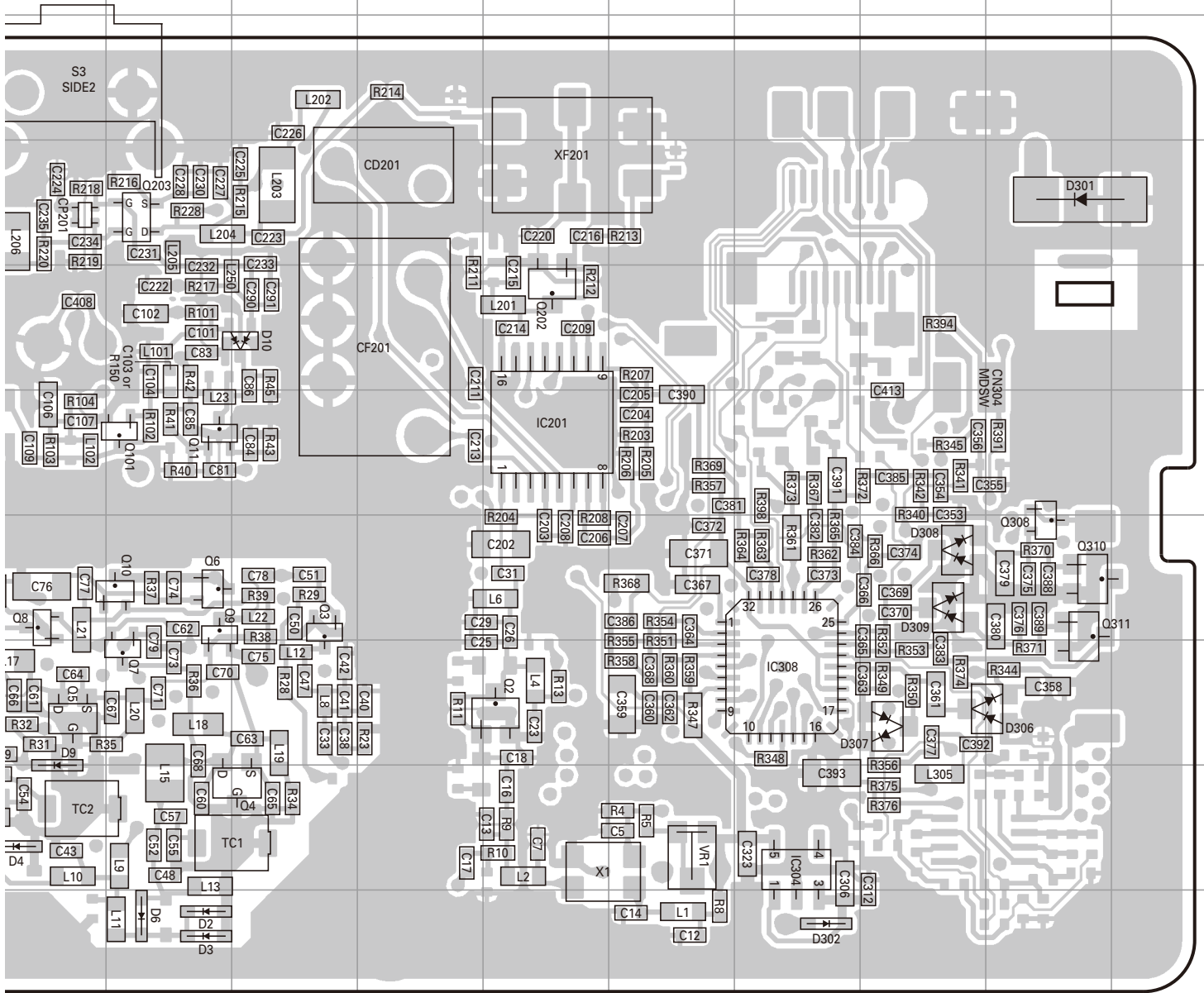


Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC201	6N	Q8	7J	Q203	4K	D8	9I	D204	4F
IC304	9P	Q9	7K	Q204	5G	D9	8J	D205	4F
IC308	8P	Q10	7K	Q308	7R	D10	5L	D301	4R
Q2	8N	Q11	6K	Q310	7R	D103	5D	D302	10P
Q3	7L	Q101	6K	Q311	7R	D104	4E	D306	8R
Q4	9L	Q102	6I	D2	10K	D106	4E	D307	8Q
Q5	8J	Q103	7H	D3	10K	D201	4I	D308	7Q
Q6	7K	Q106	7F	D4	9J	D202	4I	D309	7Q
Q7	8K	Q202	5N	D6	10K	D203	4H		

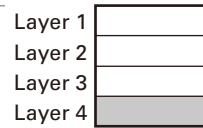


# PC BOARD TK-3302

TX-RX UNIT (X57-7582-XX) -71: E,T -72: E3  
Foil side view (J79-0187-19)



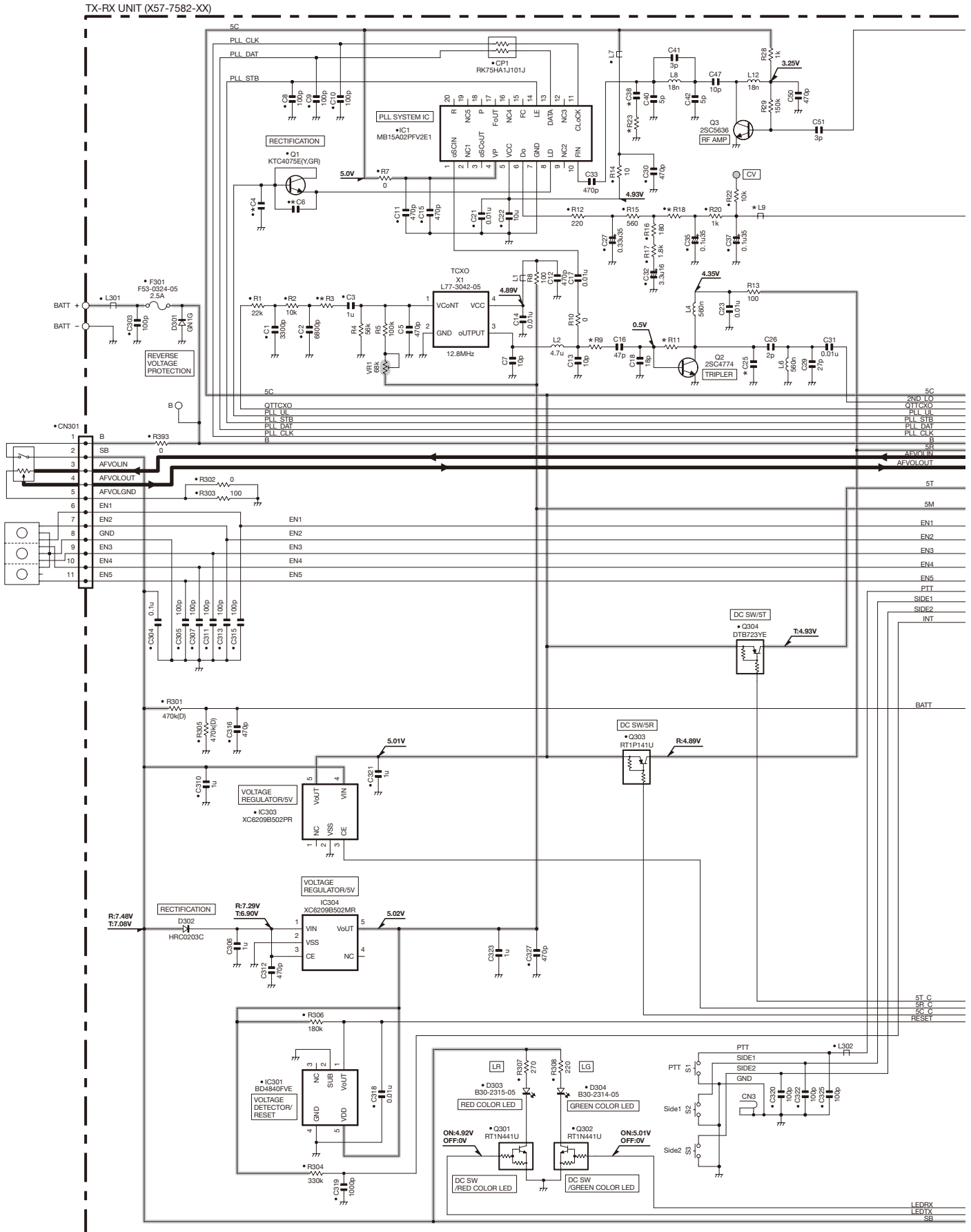
Component side



Foil side

# TK-3302 SCHEMATIC DIAGRAM

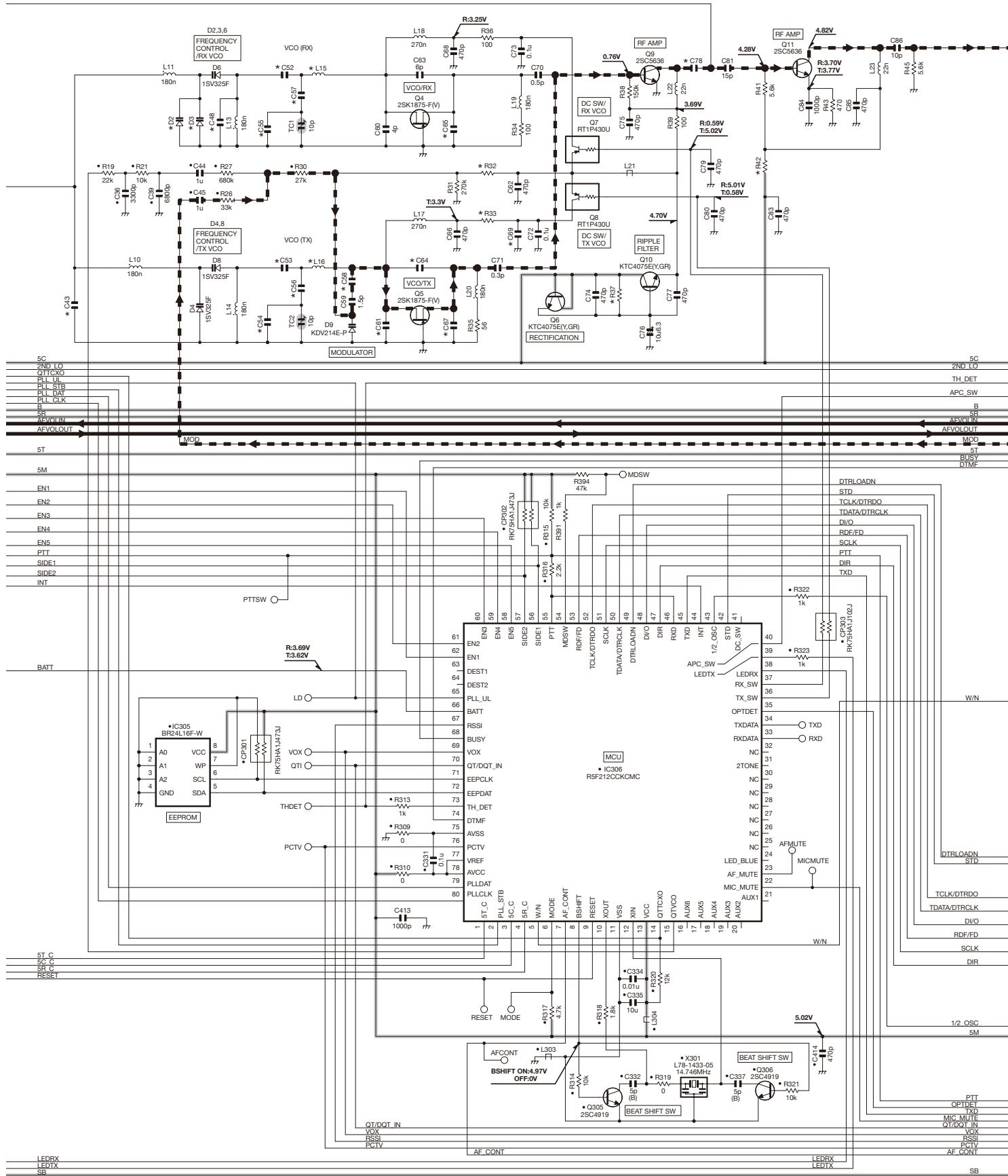
X57-7582-XX	C4	C6	C25	C38	L9	R3	R9	R11	R18	R23	
-71	E,T	0.1u	0.01u	27p	NO	L92-0138-05	180k	0	680k	330	NO
-72	E3	0.33u	470p	30p	470p	L92-0470-05	150k	820	270k	390	47



# SCHEMATIC DIAGRAM TK-3302

X57-7582-XX	C43	C48	C52	C53	C54	C55	C56	C57	C58	C61	C64	C65	C67	C69	C78	D2	D3	L15	L16	R32	R33	R37	R42	
-71	E.T	470p	NO	6p	11p	NO	2p	12p	6p	1p	3p	5p	6p	5p	NO	33p	NO	15V325F	27n	18n	470k	100	4.7k	22
-72	E3	100p	3p	9p	7p	3.5p	0.5p	8p	20p	1.5p	7p	3.5p	4p	4p	470p	30p	HVC376B	NO	33n	22n	390k	10	3.9k	47

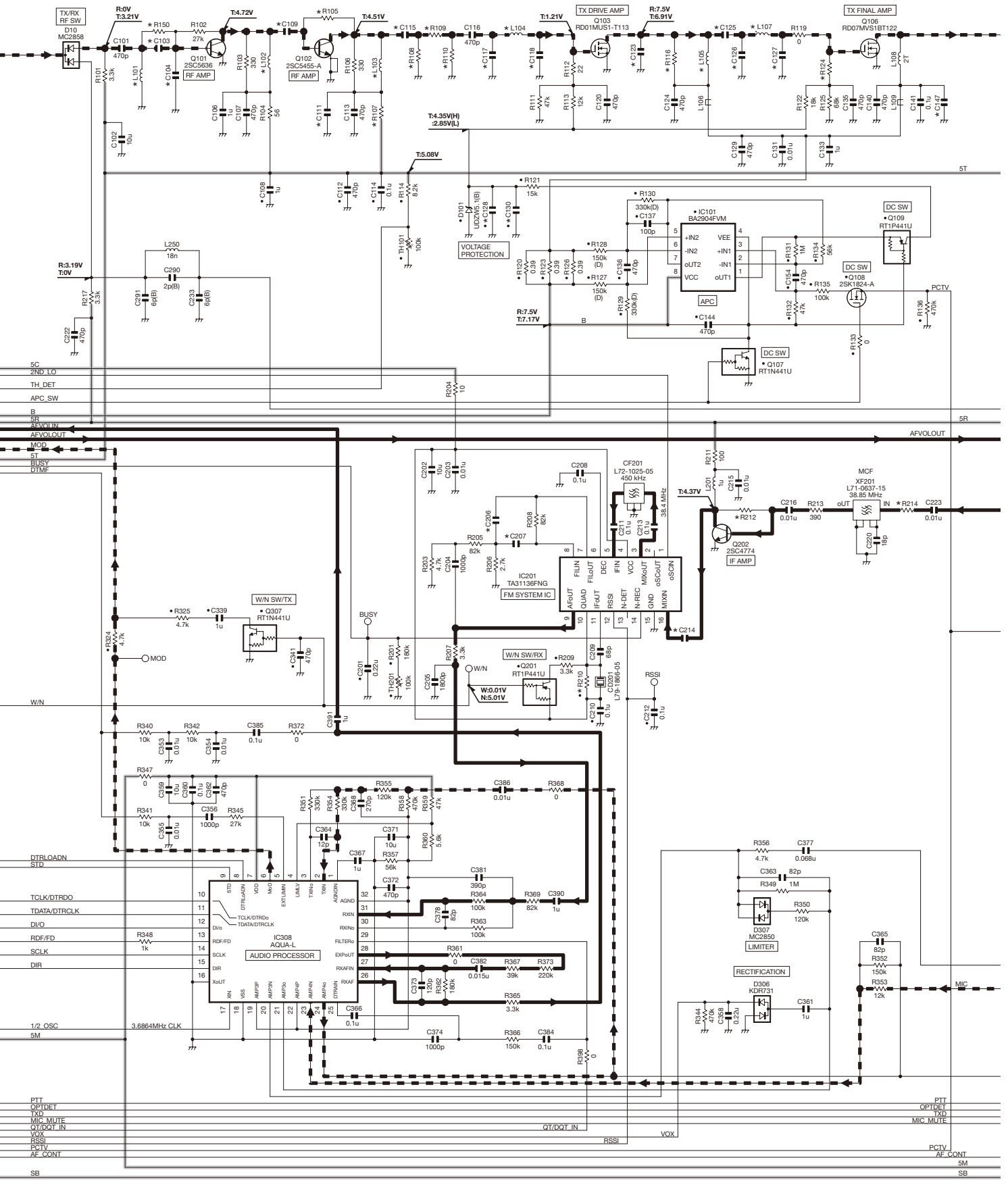
## TX-RX UNIT (X57-7582-XX)



# TK-3302 SCHEMATIC DIAGRAM

X57-7582-XX	C103	C104	C109	C111	C115	C117	C118	C123	C125	C126	C127	C128	C130	C147	C206	C207	C214	L101	L102	L103	L104	L105	L107	R105	R107	R108	R109	R110	R116	R124	R150	R210	R212	R214	
-71	E,T	NO	NO	NO	6p	18p	10u	5p	NO	9p	0.5p	15p	NO	2.2u	NO	680p	680p	11p	NO	33n	15n	1n	22n	2.7n	33k	68	820	22	820	330	22	0	3.9K	220K	330
-72	E3	12p	16p	18p	10u	5p	NO	9p	0.5p	15p	NO	47p	1u	1u	10u	820p	820p	2p	18n	27n	18n	8.2n	16n	2.2n	18k	56	1.5k	15	1.5k	NO	100	NO	4.7K	120K	100

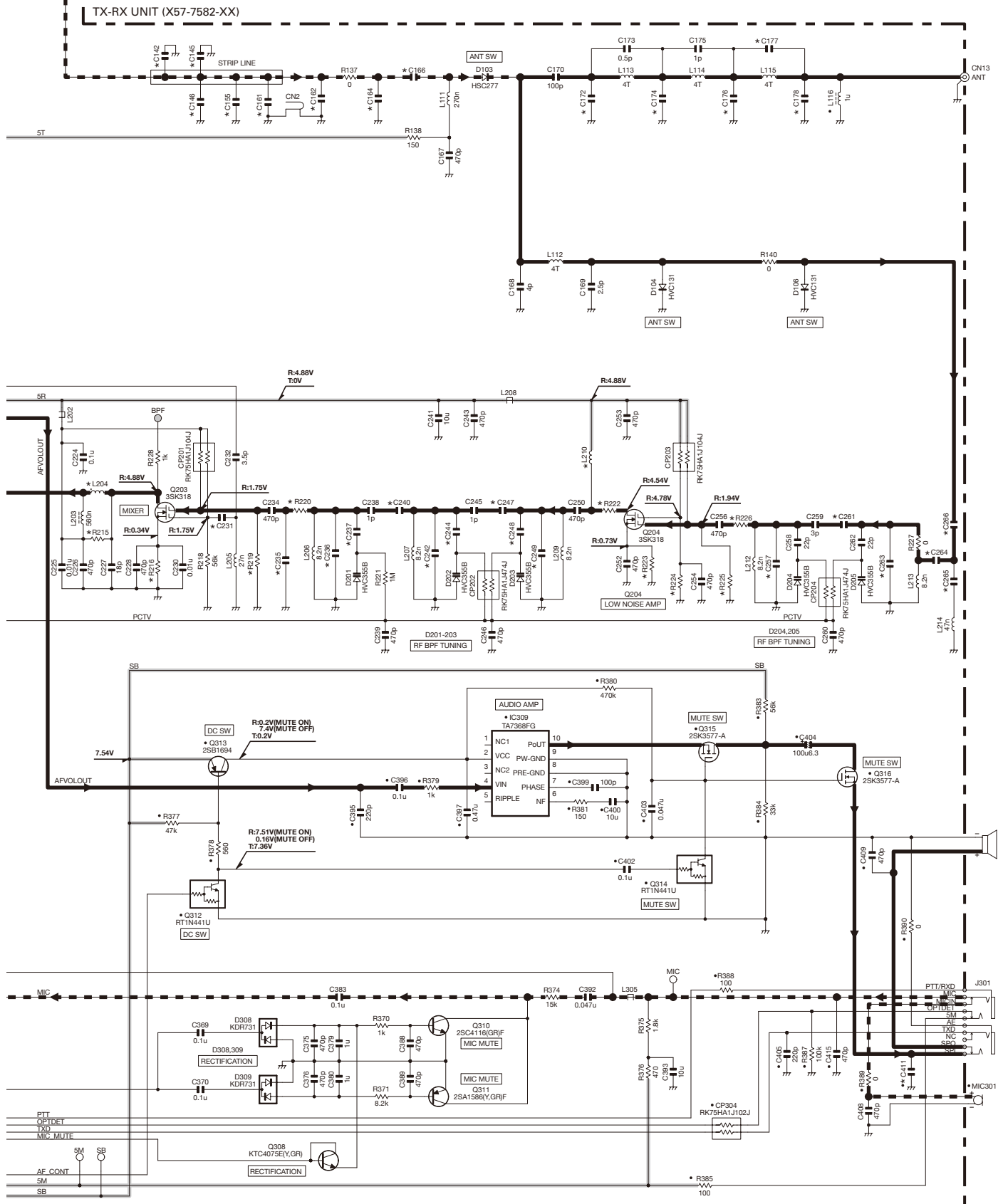
TX-RX UNIT (X57-7582-XX)



# SCHEMATIC DIAGRAM TK-3302

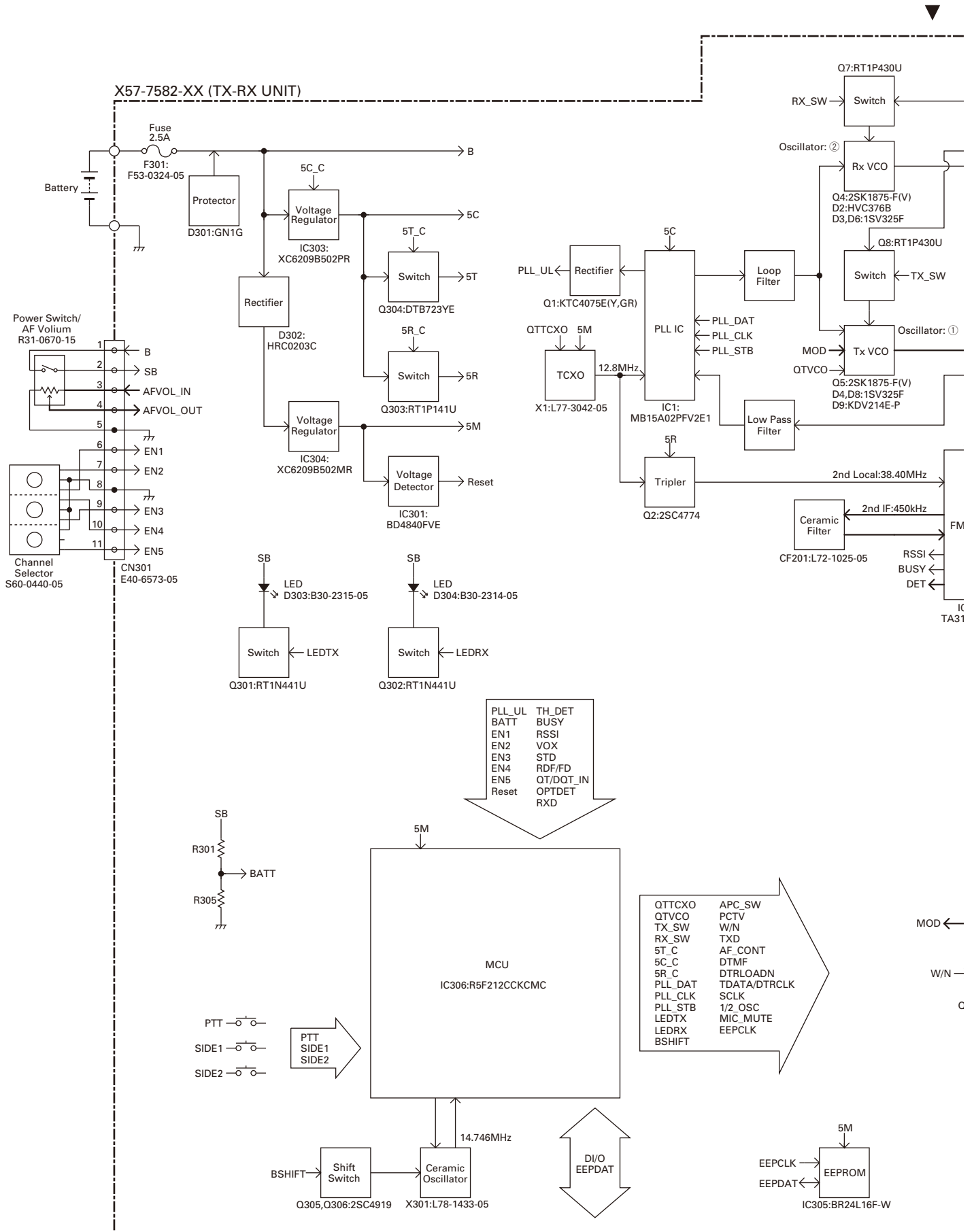
X57-7582-XX	C142	C145	C146	C155	C161	C162	C164	C166	C172	C174	C176	C177	C178	C231	C235	C236	C237	C240	C242	C244	C247	C248	C249	C257	C261	C263	C264	C265	C266	C411	
-71	E,T	43p	NO	12p	NO	1p	2p	NO	6p	5p	6p	2.5p	4p	470p	NO	4.5p	22p	6p	6p	6p	22p	4.5p	3.5p	3p	1p	4.5p	3p	5p	470p		
-72	E3	47p	36p	NO	0.3p	3p	NO	3p	7p	1p	10p	10p	1p	6p	1000p	0.75p	7p	27p	4p	8p	27p	4p	27p	8p	8p	2.5p	6p	2.5p	5p	3.5p	NO

X57-7582-XX	L204	L210	R215	R216	R219	R220	R222	R223	R224	R225	R226	
-71	E,T	150n	270n	1k	100	56k	47	39	100	NO	68k	22
-72	E3	82n	150n	2.2k	82	47k	0	100	82	680k	56k	0

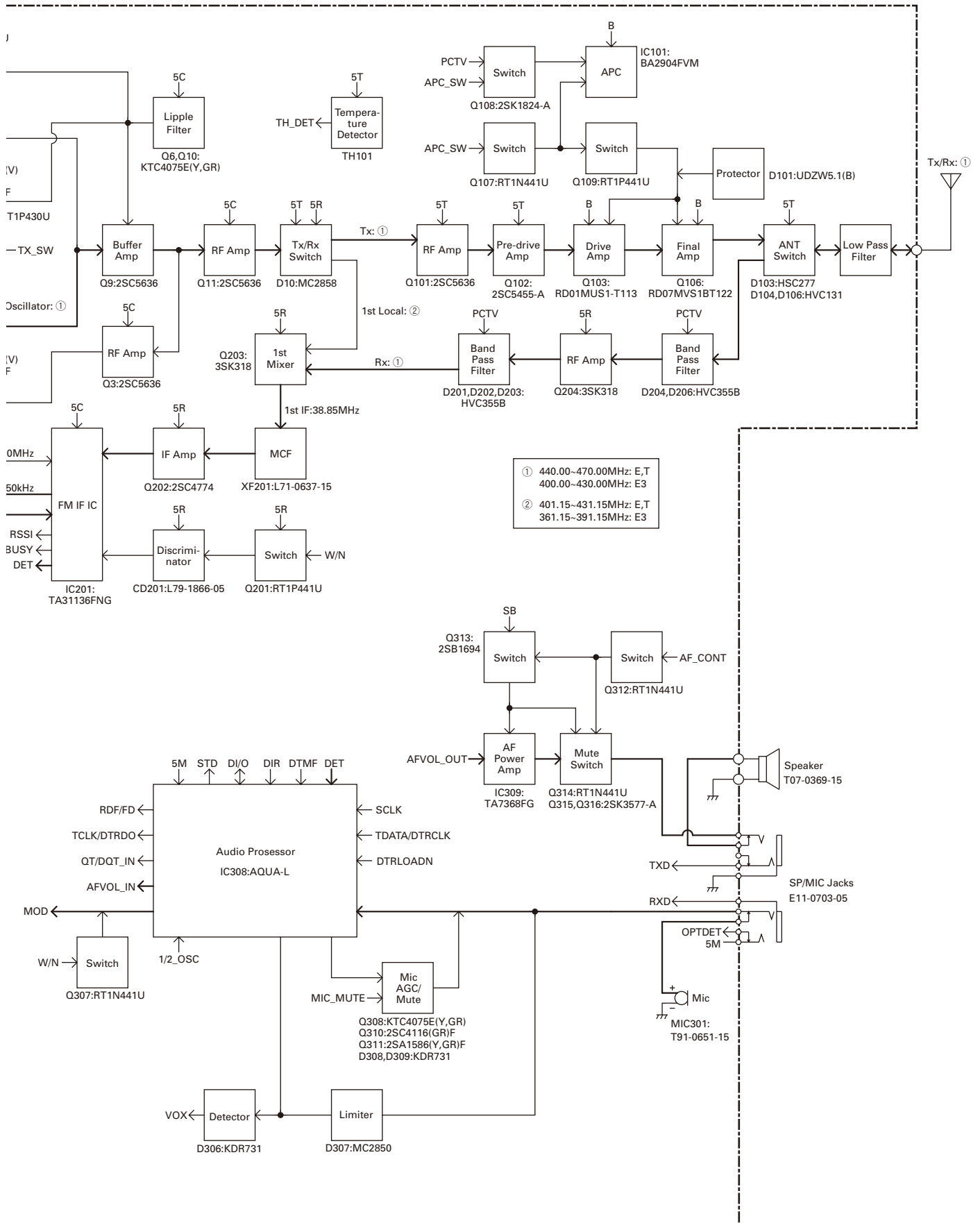


Note : The components marked with a dot (•) are parts of layer 1.

## BLOCK DIAGRAM

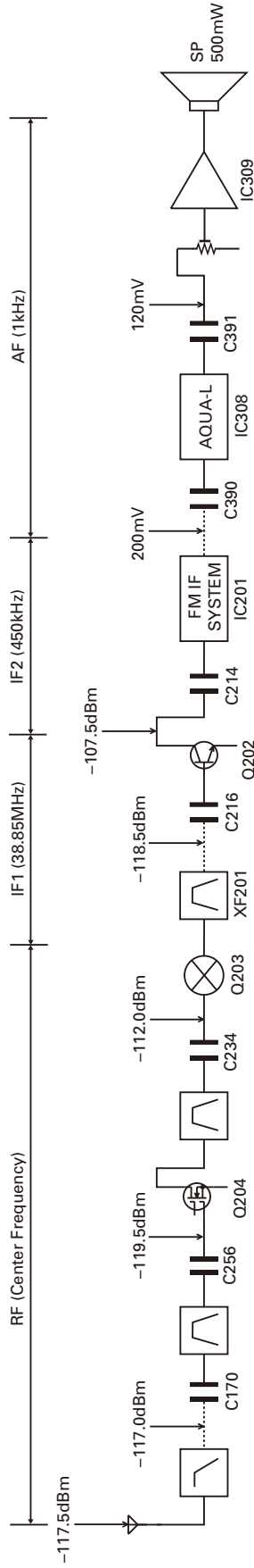


## BLOCK DIAGRAM



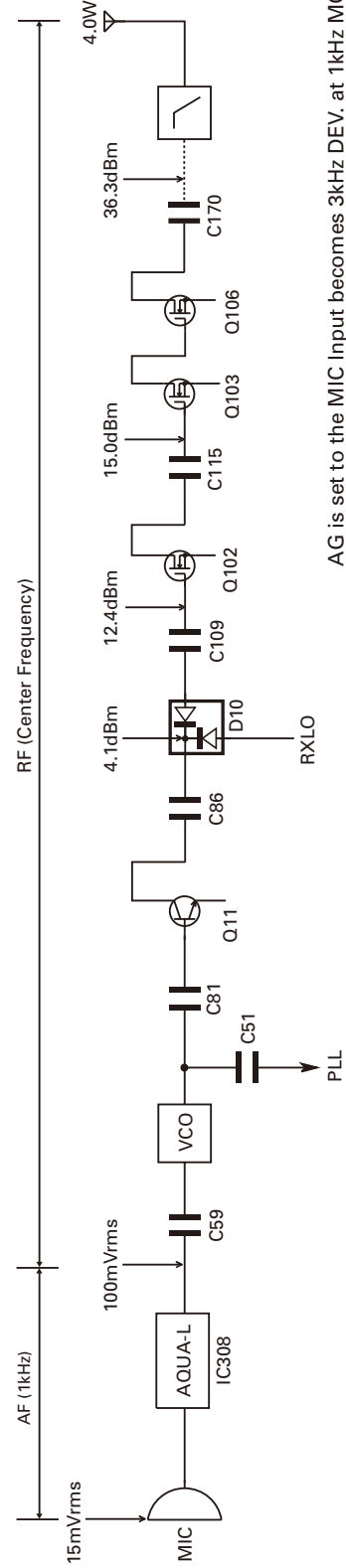
## LEVEL DIAGRAM

### Receiver Section



To make measurements in the AF section, connect the AC level meter. (ANT input: -53dBm, 1kHz FM, 3kHz DEV (Wide 5k))  
 In the RF section, use 470pF coupling capacitor. (The display shows the SSG input value required to obtain 12dB SINAD without Local Level.)

### Transmitter Section



AG is set to the MIC Input becomes 3kHz DEV. at 1kHz MOD. (Wide 5k).  
 To make measurements in the AF section, connect the AC level meter. In the RF section, use 470pF coupling capacitor.



# SPECIFICATIONS

## General

Frequency Range.....	440~470MHz (E,T) 400~430MHz (E3)
Number of Channels.....	Max. 16
Channel Spacing .....	25kHz (Wide 5k) / 20kHz (Wide 4k) / 12.5kHz (Narrow)
PLL Channel Stepping .....	5kHz, 6.25kHz
Operating Voltage.....	7.5 V DC±20%
Battery Life .....	More than 18 hours at 4 watts (5-5-90 duty cycle with KNB-45L battery)
Operating Temperature Range .....	-30°C to +60°C (-10°C to +60°C when KNB-45L in use)
Frequency Stability .....	±2.5ppm (-30°C to +60°C)
Channel Frequency Spread.....	30MHz
Dimensions and Weight (Dimensions not including protrusions)	
Radio Only .....	160g
With KNB-45L (2000mAh battery) .....	54 W x 122 H x 33.8 D mm 280g

## Receiver (Measurements made per EN standards)

Sensitivity	
EIA 12dB SINAD.....	0.28μV (Wide 5k/4k) / 0.35μV (Narrow)
EN 20dB SINAD.....	-3dBμV (0.35μV) (Wide 5k/4k) / -2dBμV (0.4μV) (Narrow)
Adjacent Channel Selectivity .....	70dB (Wide5k/4k) / 62dB (Narrow)
Intermodulation .....	65dB
Spurious Response Rejection.....	70dB
Audio Output .....	500mW/8Ω
Audio Distortion.....	Less than 10%

## Transmitter (Measurements made per EN standards)

RF Power Output.....	4W/1W
Modulation Limiting.....	±5.0kHz at 25kHz, ±4.0kHz at 20kHz, ±2.5kHz at 12.5kHz
Spurious Emission .....	-36dBm ≤ 1GHz, -30dBm > 1GHz
FM Noise (EIA) .....	45dB (Wide 5k) / 43dB (Wide 4k) / 40dB (Narrow)
Modulation Distortion.....	Less than 5%

Wide 4k: E,T type only

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### Kenwood Ibérica, S.A.

Bolivia, 239-08020 Barcelona, Spain

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Kwai Fong, N.T., Hong Kong

### Kenwood Electronics Singapore Pte Ltd

1 Ang Mo Kio Street 63, Singapore 569110



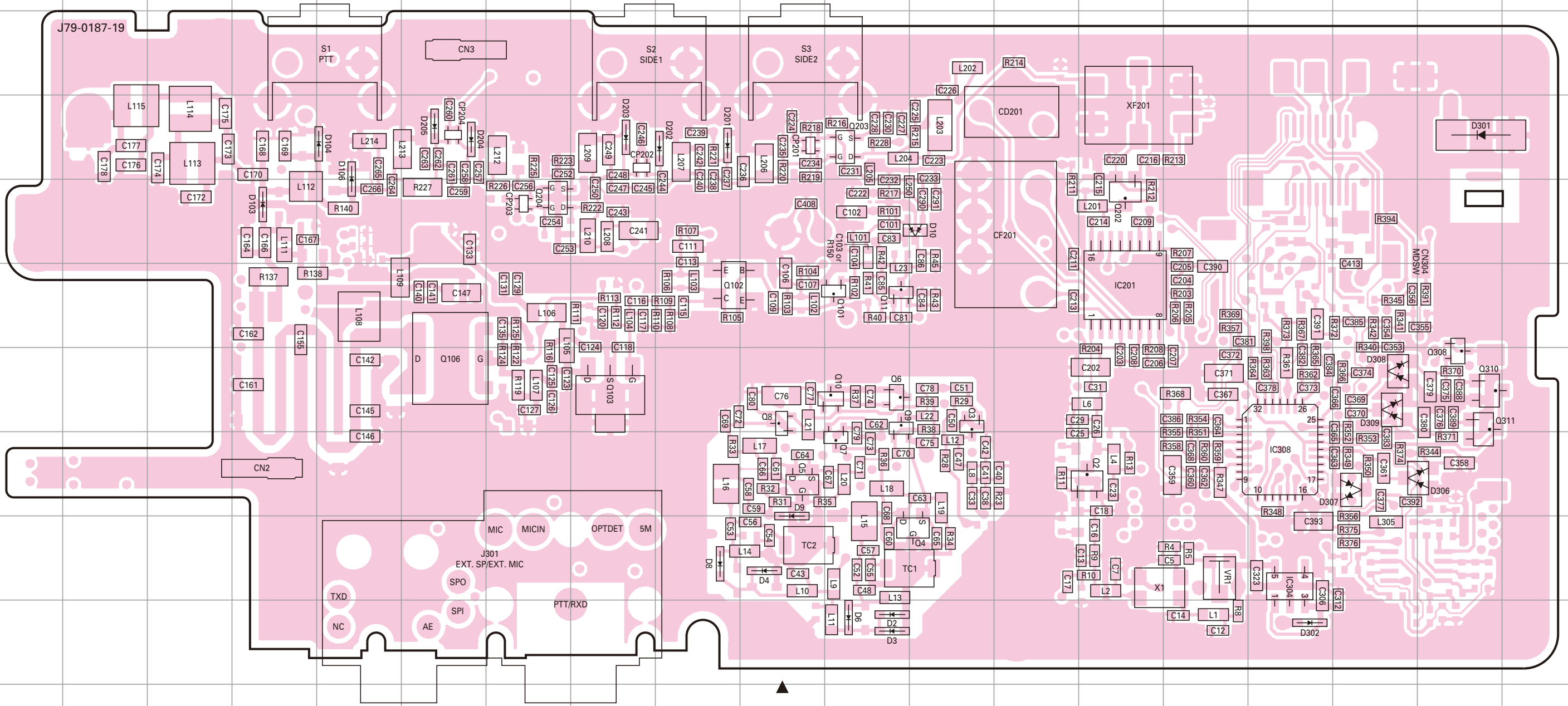


# TK-3302 PC BOARD

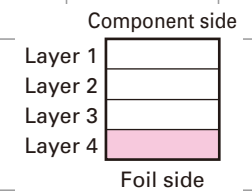
# PC BOARD TK-3302

TX-RX UNIT (X57-7582-XX) -71: E,T -72: E3  
Foil side view (J79-0187-19)

TX-RX UNIT (X57-7582-XX) -71: E,T -72: E3  
Foil side view (J79-0187-19)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC201	6N	Q8	7J	Q203	4K	D8	9I	D204	4F
IC304	9P	Q9	7K	Q204	5G	D9	8J	D205	4F
IC308	8P	Q10	7K	Q308	7R	D10	5L	D301	4R
Q2	8N	Q11	6K	Q310	7R	D103	5D	D302	10P
Q3	7L	Q101	6K	Q311	7R	D104	4E	D306	8R
Q4	9L	Q102	6I	D2	10K	D106	4E	D307	8Q
Q5	8J	Q103	7H	D3	10K	D201	4I	D308	7Q
Q6	7K	Q106	7F	D4	9J	D202	4I	D309	7Q
Q7	8K	Q202	5N	D6	10K	D203	4H		



X57-7582-XX	C4	C5	C6	C7	L9	R3	R9	R11	R18	R23
-71	E.T	470p	NO	100	NO	180k	0	680k	330	NO
-72	E3	0.33u	470p	30p	470p	L92-0470-05	150k	820	270k	47

X57-7582-XX	C43	C44	C45	C46	C47	C48	C49	C50	C51	C52	C53	C54	C55	C56	C57	C58	C59	C60	C61	C62	C63	C64	C65	C66	C67	C68	C69	C70	C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82	C83	C84	C85	C86	C87	C88	C89	C90	C91	C92	C93	C94	C95	C96	C97	C98	C99	C100	C101	C102	C103	C104	C105	C106	C107	C108	C109	C110	C111	C112	C113	C114	C115	C116	C117	C118	C119	C120	C121	C122	C123	C124	C125	C126	C127	C128	C129	C130	C131	C132	C133	C134	C135	C136	C137	C138	C139	C140	C141	C142	C143	C144	C145	C146	C147	C148	C149	C150	C151	C152	C153	C154	C155	C156	C157	C158	C159	C160	C161	C162	C163	C164	C165	C166	C167	C168	C169	C170	C171	C172	C173	C174	C175	C176	C177	C178	C179	C180	C181	C182	C183	C184	C185	C186	C187	C188	C189	C190	C191	C192	C193	C194	C195	C196	C197	C198	C199	C200	C201	C202	C203	C204	C205	C206	C207	C208	C209	C210	C211	C212	C213	C214	C215	C216	C217	C218	C219	C220	C221	C222	C223	C224	C225	C226	C227	C228	C229	C230	C231	C232	C233	C234	C235	C236	C237	C238	C239	C240	C241	C242	C243	C244	C245	C246	C247	C248	C249	C250	C251	C252	C253	C254	C255	C256	C257	C258	C259	C260	C261	C262	C263	C264	C265	C266	C267	C268	C269	C270	C271	C272	C273	C274	C275	C276	C277	C278	C279	C280	C281	C282	C283	C284	C285	C286	C287	C288	C289	C290	C291	C292	C293	C294	C295	C296	C297	C298	C299	C300	C301	C302	C303	C304	C305	C306	C307	C308	C309	C310	C311	C312	C313	C314	C315	C316	C317	C318	C319	C320	C321	C322	C323	C324	C325	C326	C327	C328	C329	C330	C331	C332	C333	C334	C335	C336	C337	C338	C339	C340	C341	C342	C343	C344	C345	C346	C347	C348	C349	C350	C351	C352	C353	C354	C355	C356	C357	C358	C359	C360	C361	C362	C363	C364	C365	C366	C367	C368	C369	C370	C371	C372	C373	C374	C375	C376	C377	C378	C379	C380	C381	C382	C383	C384	C385	C386	C387	C388	C389	C390	C391	C392	C393	C394	C395	C396	C397	C398	C399	C400	C401	C402	C403	C404	C405	C406	C407	C408	C409	C410	C411	C412	C413	C414	C415	C416	C417	C418	C419	C420	C421	C422	C423	C424	C425	C426	C427	C428	C429	C430	C431	C432	C433	C434	C435	C436	C437	C438	C439	C440	C441	C442	C443	C444	C445	C446	C447	C448	C449	C450	C451	C452	C453	C454	C455	C456	C457	C458	C459	C460	C461	C462	C463	C464	C465	C466	C467	C468	C469	C470	C471	C472	C473	C474	C475	C476	C477	C478	C479	C480	C481	C482	C483	C484	C485	C486	C487	C488	C489	C490	C491	C492	C493	C494	C495	C496	C497	C498	C499	C500	C501	C502	C503	C504	C505	C506	C507	C508	C509	C510	C511	C512	C513	C514	C515	C516	C517	C518	C519	C520	C521	C522	C523	C524	C525	C526	C527	C528	C529	C530	C531	C532	C533	C534	C535	C536	C537	C538	C539	C540	C541	C542	C543	C544	C545	C546	C547	C548	C549	C550	C551	C552	C553	C554	C555	C556	C557	C558	C559	C560	C561	C562	C563	C564	C565	C566	C567	C568	C569	C570	C571	C572	C573	C574	C575	C576	C577	C578	C579	C580	C581	C582	C583	C584	C585	C586	C587	C588	C589	C590	C591	C592	C593	C594	C595	C596	C597	C598	C599	C600	C601	C602	C603	C604	C605	C606	C607	C608	C609	C610	C611	C612	C613	C614	C615	C616	C617	C618	C619	C620	C621	C622	C623	C624	C625	C626	C627	C628	C629	C630	C631	C632	C633	C634	C635	C636	C637	C638	C639	C640	C641	C642	C643	C644	C645	C646	C647	C648	C649	C650	C651	C652	C653	C654	C655	C656	C657	C658	C659	C660	C661	C662	C663	C664	C665	C666	C667	C668	C669	C670	C671	C672	C673	C674	C675	C676	C677	C678	C679	C680	C681	C682	C683	C684	C685	C686	C687	C688	C689	C690	C691	C692	C693	C694	C695	C696	C697	C698	C699	C700	C701	C702	C703	C704	C705	C706	C707	C708	C709	C710	C711	C712	C713	C714	C715	C716	C717	C718	C719	C720	C721	C722	C723	C724	C725	C726	C727	C728	C729	C730	C731	C732	C733	C734	C735	C736	C737	C738	C739	C740	C741	C742	C743	C744	C745	C746	C747	C748	C749	C750	C751	C752	C753	C754	C755	C756	C757	C758	C759	C760	C761	C762	C763	C764	C765	C766	C767	C768	C769	C770	C771	C772	C773	C774	C775	C776	C777	C778	C779	C780	C781	C782	C783	C784	C785	C786	C787	C788	C789	C790	C791	C792	C793	C794	C795	C796	C797	C798	C799	C800	C801	C802	C803	C804	C805	C806	C807	C808	C809	C810	C811	C812	C813	C814	C815	C816	C817	C818	C819	C820	C821	C822	C823	C824	C825	C826	C827	C828	C829	C830	C831	C832	C833	C834	C835	C836	C837	C838	C839	C840	C841	C842	C843	C844	C845	C846	C847	C848	C849	C850	C851	C852	C853	C854	C855	C856	C857	C858	C859	C860	C861	C862	C863	C864	C865	C866	C867	C868	C869	C870	C871	C872	C873	C874	C875	C876	C877	C878	C879	C880	C881	C882	C883	C884	C885	C886	C887	C888	C889	C890	C891	C892	C893	C894	C895	C896	C897	C898	C899	C900	C901	C902	C903	C904	C905	C906	C907	C908	C909	C910	C911	C912	C913	C914	C915	C916	C917	C918	C919	C920	C921	C922	C923	C924	C925	C926	C927	C928	C929	C930	C931	C932	C933	C934	C935	C936	C937	C938	C939	C940	C941	C942	C943	C944	C945	C946	C947	C948	C949	C950	C951	C952	C953	C954	C955	C956	C957	C958	C959	C960	C961	C962	C963	C964	C965	C966	C967	C968	C969	C970	C971	C972	C973	C974	C975	C976	C977	C978	C979	C980	C981	C982	C983	C984	C985	C986	C987	C988	C989	C990	C991	C992	C993	C994	C995	C996	C997	C998	C999	C1000
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X57-7582-XX	C101	C109	C111	C115	C116	C125	C128	C129	C130	C137	C140	C147	C150	C151	C152	C153	C154	C155	C156	C157	C158	C159	C160	C161	C162	C163	C164	C165	C166	C167	C168	C169	C170	C171	C172	C173	C174	C175	C176	C177	C178	C179	C180	C181	C182	C183	C184	C185	C186	C187	C188	C189	C190	C191	C192	C193	C194	C195	C196	C197	C198	C199	C200	C201	C202	C203	C204	C205	C206	C207	C208	C209	C210	C211	C212	C213	C214	C215	C216	C217	C218	C219	C220	C221	C222	C223	C224	C225	C226	C227	C228	C229	C230	C231	C232	C233	C234	C235	C236	C237	C238	C239	C240	C241	C242	C243	C244	C245	C246	C247	C248	C249	C250	C251	C252	C253	C254	C255	C256	C257	C258	C259	C260	C261	C262	C263	C264	C265	C266	C267	C268	C269	C270	C271	C272	C273	C274	C275	C276	C277	C278	C279	C280	C281	C282	C283	C284	C285	C286	C287	C288	C289	C290	C291	C292	C293	C294	C295	C296	C297	C298	C299	C300	C301	C302	C303	C304	C305	C306	C307	C308	C309	C310	C311	C312	C313	C314	C315	C316	C317	C318	C319	C320	C321	C322	C323	C324	C325	C326	C327	C328	C329	C330	C331	C332	C333	C334	C335	C336	C337	C338	C339	C340	C341	C342	C343	C344	C345	C346	C347	C348	C349	C350	C351	C352	C353	C354	C355	C356	C357	C358	C359	C360	C361	C362	C363	C364	C365	C366	C367	C368	C369	C370	C371	C372	C373	C374	C375	C376	C377	C378	C379	C380	C381	C382	C383	C384	C385	C386	C387	C388	C389	C390	C391	C392	C393	C394	C395	C396	C397	C398	C399	C400	C401	C402	C403	C404	C405	C406	C407	C408	C409	C410	C411	C412	C413	C414	C415	C416	C417	C418	C419	C420	C421	C422	C423	C424	C425	C426	C427	C428	C429	C430	C431	C432	C433	C434	C435	C436	C437	C438	C439	C440	C441	C442	C443	C444	C445	C446	C447	C448	C449	C450	C451	C452	C453	C454	C455	C456	C457	C458	C459	C460	C461	C462	C463	C464	C465	C466	C467	C468	C469	C470	C471	C472	C473	C474	C475	C476	C477	C478	C479	C480	C481	C482	C483	C484	C485	C486	C487	C488	C489	C490	C491	C492	C493	C494	C495	C496	C497	C498	C499	C500	C501	C502	C503	C504	C505	C506	C507	C50
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