

**K2,K3,M2 Versions**

This TK-3302 (K2,K3,M2) service manual contains a number of sections which differ from the service manual (B51-8840-00) for the TK-3302/3302(U)/3306 (K,P,M,M3).

For item other than those in this TK-3302 (K2,K3,M2) service manual, please refer to the service manual (B51-8840-00) for the TK-3302/3302(U)/3306 (K,P,M,M3).

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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

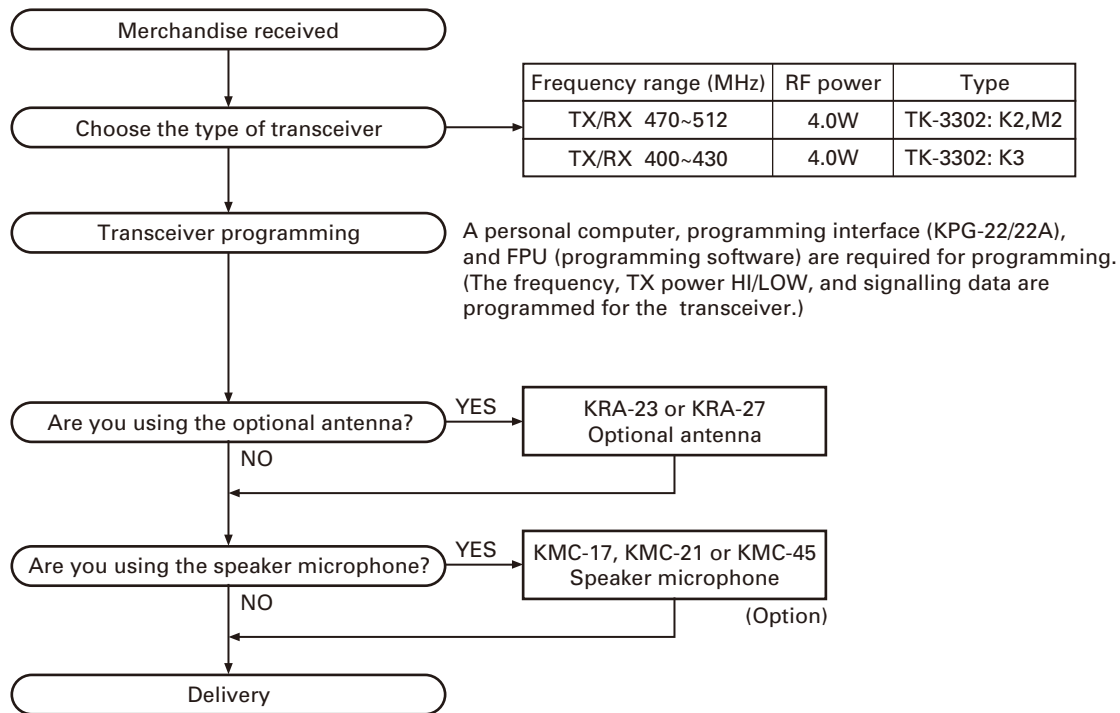
This transceiver is designed for easy servicing. Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained within.

Model	Type	TX-RX unit	Frequency range	Remarks
TK-3302	K2,M2	X57-7580-22	470~512MHz	IF1: 38.85MHz LOC: 38.4MHz
TK-3302	K3	X57-7580-23	400~430MHz	

## Service Manual List

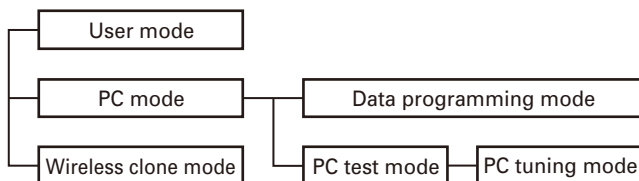
Title	Parts number	Remarks	Market code
TK-3302/3302(U)/3306	B51-8840-00		K,P,M,M3
TK-3302	B51-8852-00 This service manual	SUPPLEMENT	K2,K3,M2

## 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.
Wireless clone mode	Used to transfer programming data from one transceiver to another.

### 2. How to Enter Each Mode

Mode	Operation
User mode	Power ON
PC mode	Received commands from PC
Wireless clone mode	[PTT]+[Side2]+Power ON (Two seconds)

### 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 or compatible. 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

### Notes:

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

2. When the POWER 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 by the transceiver, the green LED lights.

### Notes :

- The data stored in the personal computer must match Model Name and Model Type when it is written into EE-PROM.
- 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 transceivers 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	K2,K3,M2	KPG-118D(K)

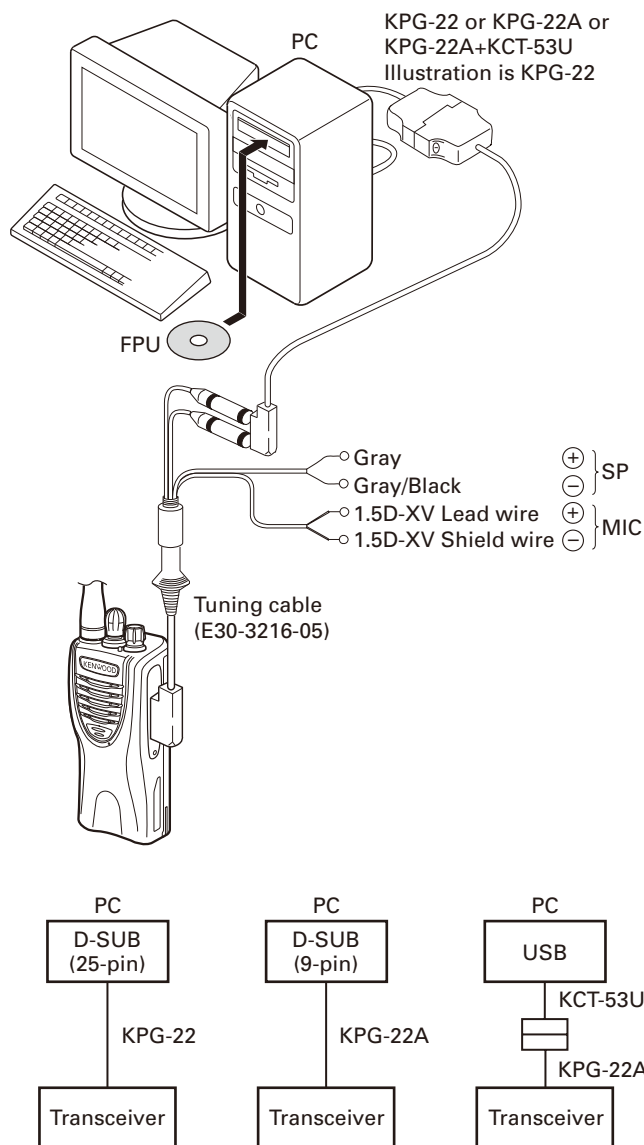


Fig. 1

## 4. Wireless Clone Mode

### 4-1. Outline

"Wireless Clone Mode" copies the transceiver data to another transceiver.

The dealer can copy the transceiver data to another transceiver even without the use of a personal computer.

### 4-2. Example

The transceiver can copy the programming data to one or more transceivers via RF communication.

The clone source and clone target/s must be in wireless clone mode.

# REALIGNMENT

## 4-3. Operation

1. To switch the clone target/s to wireless clone mode, press and hold the [PTT] and [side2] keys while turning the transceiver power ON.
2. Wait for 2 seconds. The LED will light orange and the transceiver will announce "Clone".
3. Select a channel table number using Side1 (increment channel table) and Side2 (decrement channel table) keys.
4. To switch the clone source to wireless clone mode, press and hold the [PTT] and [side2] keys while turning the transceiver power ON.
5. Wait for 2 seconds. The LED will light orange and the transceiver will announce "Clone".
6. Select the same channel table number as the clone target/s.
7. Press [PTT] on the clone source to begin data transmission.  
When the clone target starts to receive data, the LED will light green.  
When the clone source finishes sending data, a "confirmation" tone will sound.  
If data transmission fails while cloning, an "error" tone will sound from the target unit.
8. If the cloning fails, no data will be available in the target unit when it is returned to User mode.
9. When the cloning is successful, the target unit's "Scan" and "Key lock" functions will return to their default values (Scan = OFF, Key lock = OFF).

### Notes:

- The dealer can clone data to two or more transceivers by repeating the above procedures.
- If the transceivers wireless clone mode is configured as "Disabled", the transceiver cannot enter wireless clone mode.
- The table shown below will cover the frequency tables used for wireless cloning.
- Wireless clone mode cannot be entered in battery low state.
- A unit cannot be a "Source Unit" if it is unprogrammed. If [PTT] is pressed, an "error" tone will sound.
- The language used in cloning depends on the "Model type" setting, not the FPU setting.
- Once a unit is set to be the source, it cannot be a target after the data has been transmitted. This protects the data in the source unit.
- Electronic interface may cause a failure in data transfer during wireless clone, such as when waveforms or electromagnetics are being performed at the workbench.
- **Wireless clone mode can be used ONLY by the authorized service personnel.**
- **The wireless clone mode setting must be configured as "Disable" before being delivered to the end-user.**
- **To clone, replace the antenna from both the source transceiver and the target transceiver with a dummy load.**
- **The transmit output power is automatically set to Low in wireless clone mode.**

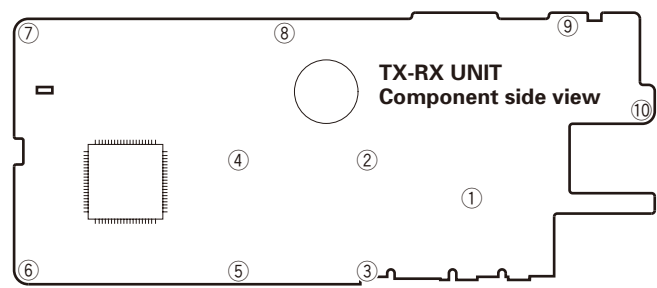
## • Clone frequency table

No.	Operating frequency (MHz)	
	TK-3302 K2,M2	TK-3302 K3
	470~512	400~430
1	472.000	400.000
2	474.000	401.000
3	476.000	402.000
4	478.000	403.000
5	480.000	404.000
6	482.000	405.000
7	484.000	406.000
8	486.000	407.000
9	488.000	408.000
10	490.000	409.000
11	492.000	410.000
12	494.000	411.000
13	496.000	412.000
14	498.000	413.000
15	500.000	414.000
16	502.000	415.000
17	504.000	416.000
18	506.000	417.000
19	508.000	418.000
20	510.000	419.000

DISASSEMBLY FOR REPAIR

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.

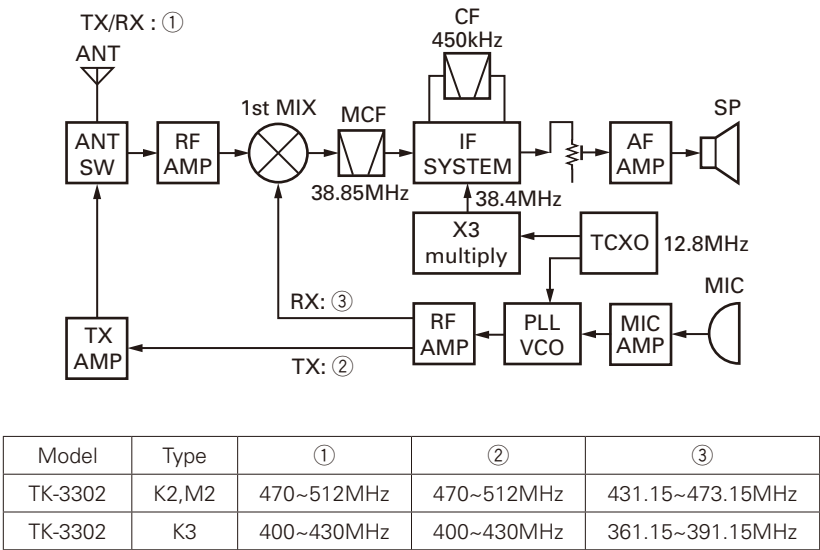


CIRCUIT DESCRIPTION

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	K2,M2	470~512MHz	470~512MHz	431.15~473.15MHz
TK-3302	K3	400~430MHz	400~430MHz	361.15~391.15MHz

Fig. 1 Frequency configuration

## PARTS LIST

## CAPACITORS

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

1 = Type ... ceramic, electrolytic, etc.

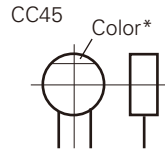
2 = Shape ... round, square, etc.

3 = Temp. coefficient

4 = Voltage rating

5 = Value

6 = Tolerance



## • Capacitor value

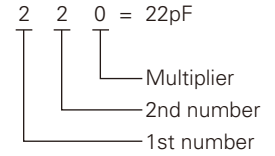
010 = 1pF

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	3150	4000	5000	6300	8000	-

## • Chip capacitors

(EX) CC 73 F SL 1H 000 J Refer to the table above.

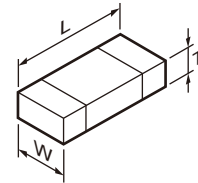
(Chip) (CH, RH, UJ, SL)

(EX) CK 73 F F 1H 000 Z

(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) RD 73 E B 2B 000 J

(Chip) (B, F)

## • Carbon resistor (Normal type)

(EX) RD 14 B B 2C 000 J

- 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.

TK-3302 (Y50-6350-XX)

TX-RX UNIT (X57-7580-XX)

L : Scandinavia

Y : PX (Far East, Hawaii)

Y : AAFES (Europe)

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

Ref. No.	Address	New parts	Parts No.	Description	Destination
TK-3302					
1	1A		A02-4040-03	PLASTIC CABINET ASSY	K,M,K2 K3,M2 P
2	3A		A10-4124-01	CHASSIS	
4	2C,2E		B09-0725-03	CAP ACCESSORY	
7	1C		B62-2109-00	INSTRUCTION MANUAL	
7	1C		B62-2109-00	INSTRUCTION MANUAL	
8	1E		B62-2139-00	INSTRUCTION MANUAL	
9	1A		D10-0649-03	LEVER	
10	1A		D21-0863-04	SHAFT	
11	1A		D32-0441-13	STOPPER	
13	3B		E04-0477-05	RF COAXIAL RECEPTACLE (SMA)	
14	3A		E23-1253-04	TERMINAL (BATT-)	P
15	2A		E23-1254-04	TERMINAL (BATT+)	
16	2B		E37-1175-15	SP WIRE LEAD (BROWN)	
17	2B		E37-1176-15	SP 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-)	K,M,K2 K3,M2 P
27	3A		G13-2034-14	CUSHION (CHASSIS-)	
28	3A		G13-2038-24	CUSHION (CHASSIS-CERAMIC FILTER)	
29	3A		G13-2039-14	CUSHION (PCB-CERAMIC FILTER)	
30	3A		G53-1604-03	PACKING (CHASSIS)	
31	2A		G53-1605-03	PACKING (BATT+)	
32	2A		G53-1609-14	PACKING (ECM)	
33	2B		G53-1799-03	PACKING (VOLUME/SELECTOR)	
34	1B		G53-1800-03	PACKING (SP/MIC)	
35	1B		G53-1801-03	PACKING (SPEAKER)	
36	2B		G53-1802-04	PACKING (SMA)	P K,M,K2 K3,M2 P K,M,K2 K3,M2 P
38	2E	*	H12-4250-05	PACKING FIXTURE	
39	2D		H12-4251-05	PACKING FIXTURE	
39	2D		H12-4251-05	PACKING FIXTURE	
40	1F		H13-2109-03	CARTON BOARD	
42	3D		H52-2300-13	ITEM CARTON CASE	
42	3D		H52-2300-13	ITEM CARTON CASE	
43	3F		H52-2301-13	ITEM CARTON CASE	
46	2A		J19-5463-03	HOLDER (BATT+)	
47	2A		J19-5473-03	HOLDER ASSY (BATT+)	
48	2C,2E		J19-5521-03	HOLDER (SP/MIC) ACCSSORY	P K,M,K2 K3,M2 P K,M,K2 K3,M2 P
49	2B		J19-5522-03	SPEAKER CLASP	
50	2C,1E		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 (MON/PF)	
57	1B		K29-9427-03	KNOB (SELECTOR)	
A	3B		N14-0848-05	CIRCULAR NUT (SELECTOR)	

Ref. No.	Address	New parts	Parts No.	Description	Desti- nation		
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			
67	1B		T07-0369-15	SPEAKER			
68	2D,2E		T90-1039-25	WHIP ANTENNA	K,P,M		
68	2D		T90-1040-25	WHIP ANTENNA	K2,M2		
68	2D		T90-1041-25	WHIP ANTENNA	K3		
70	1F		W08-0970-35	AC ADAPTER (TRANSFORMER)	P		
71	1C		W08-0988-05	CHARGER (KSC-35)	K,M,K2		
71	1C		W08-0988-05	CHARGER (KSC-35)	K3,M2		
72	1D		W08-0989-15	AC ADAPTER (SWITCHING)	K,K2,K3		
73	1D		W08-0992-05	AC ADAPTER (SWITCHING)	M,M2		
74	2F		W08-1067-05	CHARGER (KSC-31)	P		
TX-RX UNIT (X57-7580-XX)   -20: K,P,M   -22: K2,M2   -23: K3							
D303			B30-2315-05	LED (RED)			
D304			B30-2314-05	LED (GREEN)			
C1			CK73HB1H332K	CHIP C            3300PF    K		K,P,M	
C2			CK73HB1C682K	CHIP C            6800PF    K			
C3			CK73GB1A105K	CHIP C            1.0UF     K			
C4			CK73HB1A104K	CHIP C            0.10UF    K			
C5			CK73HB1H471K	CHIP C            470PF     K			
C5			CK73HB1H471K	CHIP C            470PF     K		K2,M2	
C5,6			CK73HB1H471K	CHIP C            470PF     K		K3	
C6			CK73HB1E103K	CHIP C            0.010UF   K		K,P,M	
C6			CK73HB1E103K	CHIP C            0.010UF   K		K2,M2	
C7			CC73HCH1H100D	CHIP C            10PF      D		K,P,M	
C8-10			CC73HCH1H101J	CHIP C            100PF     J			
C11			CK73FB0J106K	CHIP C            10UF      K			
C11			CK73FB0J106K	CHIP C            10UF      K			K2,M2
C11			CK73FB1H471K	CHIP C            470PF     K			K3
C12			CK73HB1H471K	CHIP C            470PF     K		K3	
C13			CC73HCH1H100D	CHIP C            10PF      D			
C14			CK73HB1E103K	CHIP C            0.010UF   K			
C14,15			CK73HB1E103K	CHIP C            0.010UF   K			
C14,15			CK73HB1E103K	CHIP C            0.010UF   K			
C15			CK73HB1H471K	CHIP C            470PF     K		K2,M2	
C16			CC73HCH1H470J	CHIP C            47PF      J		K3	
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		K	
C25	CC73HCH1H300J	CHIP C            30PF      J					
C26	CC73HCH1H020B	CHIP C            2.0PF     B					
C27	CS77AA1VR33M	CHIP TNTL       0.33UF    35WV					
C29	CC73HCH1H270J	CHIP C            27PF      J					



## PARTS LIST

TX-RX UNIT (X57-7580-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C30			CC73HCH1H101J	CHIP C 100PF J	K2,M2	C71			CC73HCH1H0R3B	CHIP C 0.3PF B	K2,K3,M2
C30			CK73HB1H471K	CHIP C 470PF K	K,P,M	C72,73			CK73HB1A104K	CHIP C 0.10UF K	
C30			CK73HB1H471K	CHIP C 470PF K	K3	C74,75			CK73HB1H471K	CHIP C 470PF K	
C31			CK73HB1E103K	CHIP C 0.010UF K		C76			CS77CP0J100M	CHIP TNTL 10UF 6.3WV	
C32			CS77CA1C3R3M	CHIP TNTL 3.3UF 16WV		C77			CK73HB1H471K	CHIP C 470PF K	
C33			CK73HB1H471K	CHIP C 470PF K		C78			CC73HCH1H300J	CHIP C 30PF J	K3
C35			CS77CA1V0R1M	CHIP TNTL 0.1UF 35WV	K,P,M	C78			CC73HCH1H330J	CHIP C 33PF J	K,P,M
C35			C92-0863-05	CHIP TNTL 0.047UF 35WV	K2,K3,M2	C78			CC73HCH1H330J	CHIP C 33PF J	K2,M2
C36			CK73HB1H332K	CHIP C 3300PF K		C79,80			CK73HB1H471K	CHIP C 470PF K	
C38			CK73HB1H471K	CHIP C 470PF K	K3	C81			CC73HCH1H150J	CHIP C 15PF J	
C39			CK73HB1C682K	CHIP C 6800PF K		C83-85			CK73HB1H471K	CHIP C 470PF K	
C40			CC73HCH1H050B	CHIP C 5.0PF B		C86			CC73HCH1H100B	CHIP C 10PF B	
C41			CC73HCH1H030B	CHIP C 3.0PF B		C101,102			CK73HB1H471K	CHIP C 470PF K	
C42			CC73HCH1H050B	CHIP C 5.0PF B		C103			CC73HCH1H120J	CHIP C 12PF J	K2,K3,M2
C43			CC73HCH1H101J	CHIP C 100PF J	K3	C103			CC73HCH1H300J	CHIP C 30PF J	K,P,M
C44,45			CK73GB1A105K	CHIP C 1.0UF K		C104			CC73HCH1H040B	CHIP C 4.0PF B	K,P,M
C47			CC73HCH1H100C	CHIP C 10PF C		C104			CC73HCH1H160J	CHIP C 16PF J	K3
C50			CK73HB1H471K	CHIP C 470PF K		C106			CK73GB1A105K	CHIP C 1.0UF K	
C51			CC73HCH1H030B	CHIP C 3.0PF B	K3	C107			CK73HB1H471K	CHIP C 470PF K	
C51			CC73HCH1H100D	CHIP C 10PF D	K,P,M	C108			CK73GB1A105K	CHIP C 1.0UF K	
C51			CC73HCH1H100D	CHIP C 10PF D	K2,M2	C109			CC73HCH1H060B	CHIP C 6.0PF B	K,P,M
C52			CC73HCH1H090B	CHIP C 9.0PF B	K,P,M	C109			CC73HCH1H060B	CHIP C 6.0PF B	K2,M2
C52			CC73HCH1H110J	CHIP C 11PF J	K2,M2	C109			CC73HCH1H180J	CHIP C 18PF J	K3
C52			CC73HCH1H150J	CHIP C 15PF J	K3	C111			CK73GB1A105K	CHIP C 1.0UF K	
C53			CC73HCH1H080B	CHIP C 8.0PF B	K2,M2	C112,113			CK73HB1H471K	CHIP C 470PF K	
C53			CC73HCH1H090B	CHIP C 9.0PF B	K3	C114			CK73HB1A104K	CHIP C 0.10UF K	
C53			CC73HCH1H110J	CHIP C 11PF J	K,P,M	C115			CC73HCH1H050B	CHIP C 5.0PF B	K2,K3,M2
C55			CC73HCH1H0R5B	CHIP C 0.5PF B	K,P,M	C115			CC73HCH1H110J	CHIP C 11PF J	K,P,M
C55			CC73HCH1H020B	CHIP C 2.0PF B	K3	C117			CC73HCH1H020B	CHIP C 2.0PF B	K2,M2
C56			CC73HCH1H060B	CHIP C 6.0PF B	K2,M2	C117			CC73HCH1H110J	CHIP C 11PF J	K,P,M
C56			CC73HCH1H080B	CHIP C 8.0PF B	K3	C118			CC73HCH1H090B	CHIP C 9.0PF B	K3
C56			CC73HCH1H120J	CHIP C 12PF J	K,P,M	C120			CK73HB1H471K	CHIP C 470PF K	
C57			CC73HCH1H040B	CHIP C 4.0PF B	K,P,M	C122			CK73HB0J105K	CHIP C 1.0UF K	K2,K3,M2
C57			CC73HCH1H090B	CHIP C 9.0PF B	K2,M2	C123			CC73HCH1H0R5B	CHIP C 0.5PF B	K3
C57			CC73HCH1H100B	CHIP C 10PF B	K3	C124			CK73HB1H471K	CHIP C 470PF K	
C58,59			CC73HCH1H010B	CHIP C 1.0PF B	K,P,M	C125			CC73HCH1H100B	CHIP C 10PF B	K,P,M
C58,59			CC73HCH1H010B	CHIP C 1.0PF B	K2,M2	C125			CC73HCH1H100B	CHIP C 10PF B	K2,M2
C58,59			CC73HCH1H1R5B	CHIP C 1.5PF B	K3	C125			CC73HCH1H150J	CHIP C 15PF J	K3
C60			CC73HCH1H020B	CHIP C 2.0PF B	K,P,M	C126			CC73HCH1H060B	CHIP C 6.0PF B	K2,M2
C60			CC73HCH1H040B	CHIP C 4.0PF B	K3	C126			CC73HCH1H110J	CHIP C 11PF J	K,P,M
C60,61			CC73HCH1H030B	CHIP C 3.0PF B	K2,M2	C127			CC73HCH1H160J	CHIP C 16PF J	K,P,M
C61			CC73HCH1H030B	CHIP C 3.0PF B	K,P,M	C127			CC73HCH1H180J	CHIP C 18PF J	K2,M2
C61			CC73HCH1H070B	CHIP C 7.0PF B	K3	C127			CC73HCH1H470J	CHIP C 47PF J	K3
C62			CK73HB1H471K	CHIP C 470PF K		C128,129			CK73HB1H471K	CHIP C 470PF K	
C63			CC73HCH1H050B	CHIP C 5.0PF B	K2,M2	C130			CK73GB1A105K	CHIP C 1.0UF K	
C63			CC73HCH1H060B	CHIP C 6.0PF B	K,P,M	C131			CK73HB1E103K	CHIP C 0.010UF K	
C63			CC73HCH1H060B	CHIP C 6.0PF B	K3	C132			CC73HCH1H560J	CHIP C 56PF J	K2,M2
C64			CC73HCH1H040B	CHIP C 4.0PF B	K2,M2	C133			CK73GB1A105K	CHIP C 1.0UF K	
C64			CC73HCH1H050B	CHIP C 5.0PF B	K,P,M	C135,136			CK73HB1H471K	CHIP C 470PF K	
C64			CC73HCH1H3R5B	CHIP C 3.5PF B	K3	C137			CC73HCH1H101J	CHIP C 100PF J	
C65			CC73HCH1H040B	CHIP C 4.0PF B	K3	C140			CK73HB1H471K	CHIP C 470PF K	
C65			CC73HCH1H060B	CHIP C 6.0PF B	K,P,M	C141			CK73HB1A104K	CHIP C 0.10UF K	
C65			CC73HCH1H060B	CHIP C 6.0PF B	K2,M2	C142			CC73GCH1H430J	CHIP C 43PF J	K,P,M
C66			CK73HB1H471K	CHIP C 470PF K		C142			CC73GCH1H470J	CHIP C 47PF J	K3
C67			CC73HCH1H040B	CHIP C 4.0PF B	K2,K3,M2	C143			CC73GCH1H300J	CHIP C 30PF J	K2,M2
C67			CC73HCH1H050B	CHIP C 5.0PF B	K,P,M	C144			CK73HB1H471K	CHIP C 470PF K	
C68			CK73HB1H471K	CHIP C 470PF K	K2,K3,M2	C145			CC73GCH1H010B	CHIP C 1.0PF B	K2,M2
C68,69			CK73HB1H471K	CHIP C 470PF K	K,P,M	C145			CC73GCH1H360J	CHIP C 36PF J	K3
C70			CC73HCH1H0R5B	CHIP C 0.5PF B	K2,K3,M2	C146			CC73GCH1H120J	CHIP C 12PF J	K,P,M
C70,71			CC73HCH1H0R5B	CHIP C 0.5PF B	K,P,M	C154			CK73HB1H471K	CHIP C 470PF K	

## PARTS LIST

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C155			CC73GCH1H0R3B	CHIP C 0.3PF B	K3	C232			CC73HCH1H040B	CHIP C 4.0PF B	K2,M2
C161			CC73GCH1H010B	CHIP C 1.0PF B	K,P,M	C232			CC73HCH1H3R5B	CHIP C 3.5PF B	K,P,M
C161			CC73GCH1H1R5B	CHIP C 1.5PF B	K3	C232			CC73HCH1H3R5B	CHIP C 3.5PF B	K3
C162			CC73GCH1H010B	CHIP C 1.0PF B	K2,M2	C233			CC73HCH1H060B	CHIP C 6.0PF B	
C162			CC73GCH1H020B	CHIP C 2.0PF B	K,P,M	C234			CK73HB1H471K	CHIP C 470PF K	
C164			CC73GCH1H030B	CHIP C 3.0PF B	K3	C235			CC73HCH1HR75B	CHIP C 0.75PF B	K3
C166			CC73GCH1H050B	CHIP C 5.0PF B	K2,M2	C236			CC73GCH1H040B	CHIP C 4.0PF B	K,P,M
C166			CC73GCH1H060B	CHIP C 6.0PF B	K,P,M	C236			CC73GCH1H070B	CHIP C 7.0PF B	K3
C166			CC73GCH1H070B	CHIP C 7.0PF B	K3	C236			CC73GCH1H2R5B	CHIP C 2.5PF B	K2,M2
C167			CK73HB1H471K	CHIP C 470PF K		C237			CC73HCH1H220J	CHIP C 22PF J	K,P,M
C168			CC73GCH1H040B	CHIP C 4.0PF B	K,P,M	C237			CC73HCH1H270J	CHIP C 27PF J	K3
C168			CC73GCH1H040B	CHIP C 4.0PF B	K3	C237			CC73HCH1H300J	CHIP C 30PF J	K2,M2
C168			CC73GCH1H2R5B	CHIP C 2.5PF B	K2,M2	C238			CC73HCH1H010B	CHIP C 1.0PF B	
C169			CC73GCH1H040B	CHIP C 4.0PF B	K2,M2	C239			CK73HB1H471K	CHIP C 470PF K	
C169			CC73GCH1H2R5B	CHIP C 2.5PF B	K,P,M	C240			CC73HCH1H020B	CHIP C 2.0PF B	K,P,M
C169			CC73GCH1H2R5B	CHIP C 2.5PF B	K3	C240			CC73HCH1H040B	CHIP C 4.0PF B	K3
C170			CC73GCH1H101J	CHIP C 100PF J		C240			CC73HCH1H1R5B	CHIP C 1.5PF B	K2,M2
C172			CC73GCH1H010B	CHIP C 1.0PF B	K3	C241			CK73FB0J106K	CHIP C 10UF K	
C172			CC73GCH1H030B	CHIP C 3.0PF B	K,P,M	C242			CC73HCH1H040B	CHIP C 4.0UF B	K2,M2
C172			CC73GCH1H060B	CHIP C 6.0PF B	K2,M2	C242			CC73HCH1H060B	CHIP C 6.0PF B	K,P,M
C173			CC73GCH1H0R5B	CHIP C 0.5PF B	K,P,M	C242			CC73HCH1H080B	CHIP C 8.0PF B	K3
C173			CC73GCH1H0R5B	CHIP C 0.5PF B	K3	C243			CK73HB1H471K	CHIP C 470PF K	
C174			CC73GCH1H050B	CHIP C 5.0PF B	K,P,M	C244			CC73HCH1H220J	CHIP C 22PF J	K,P,M
C174			CC73GCH1H100C	CHIP C 10PF C	K3	C244			CC73HCH1H270J	CHIP C 27PF J	K3
C174			CC73GCH1H110J	CHIP C 11PF J	K2,M2	C244			CC73HCH1H300J	CHIP C 30PF J	K2,M2
C175			CC73GCH1H020B	CHIP C 2.0PF B	K,P,M	C245			CC73HCH1HR75B	CHIP C 0.75PF B	K2,M2
C176			CC73GCH1H050B	CHIP C 5.0PF B	K,P,M	C245			CC73HCH1H010B	CHIP C 1.0PF B	K,P,M
C176			CC73GCH1H070B	CHIP C 7.0PF B	K2,M2	C245			CC73HCH1H010B	CHIP C 1.0PF B	K3
C176			CC73GCH1H100C	CHIP C 10PF C	K3	C246			CK73HB1H471K	CHIP C 470PF K	
C177			CC73GCH1H0R3B	CHIP C 0.3PF B	K3	C247			CC73HCH1H020B	CHIP C 2.0PF B	K,P,M
C177			CC73GCH1H0R5B	CHIP C 0.5PF B	K2,M2	C247			CC73HCH1H020B	CHIP C 2.0PF B	K2,M2
C177			CC73GCH1H020B	CHIP C 2.0PF B	K,P,M	C247			CC73HCH1H040B	CHIP C 4.0PF B	K3
C178			CC73GCH1H020B	CHIP C 2.0PF B	K2,M2	C248			CC73HCH1H220J	CHIP C 22PF J	K,P,M
C178			CC73GCH1H030B	CHIP C 3.0PF B	K,P,M	C248			CC73HCH1H270J	CHIP C 27PF J	K3
C178			CC73GCH1H060B	CHIP C 6.0PF B	K3	C248			CC73HCH1H300J	CHIP C 30PF J	K2,M2
C201			CK73GB1C224K	CHIP C 0.22UF K		C249			CC73GCH1H030B	CHIP C 3.0PF B	K2,M2
C202			CK73FB0J106K	CHIP C 10UF K		C249			CC73GCH1H040B	CHIP C 4.0PF B	K,P,M
C203			CK73HB1E103K	CHIP C 0.010UF K		C249			CC73GCH1H080B	CHIP C 8.0PF B	K3
C204			CK73HB1H102K	CHIP C 1000PF K		C250			CK73HB1H471K	CHIP C 470PF K	
C205			CK73HB1H182K	CHIP C 1800PF K		C252-254			CK73HB1H471K	CHIP C 470PF K	
C206,207			CK73HB1H561K	CHIP C 560PF K		C256			CK73HB1H471K	CHIP C 470PF K	
C208			CK73HB1A104K	CHIP C 0.10UF K		C257			CC73HCH1H080B	CHIP C 8.0PF B	K3
C209			CC73HCH1H680J	CHIP C 68PF J		C257			CC73HCH1H2R5B	CHIP C 2.5PF B	K2,M2
C210-213			CK73HB1A104K	CHIP C 0.10UF K		C257			CC73HCH1H3R5B	CHIP C 3.5PF B	K,P,M
C214			CC73HCH1H020B	CHIP C 2.0PF B		C258			CC73HCH1H220J	CHIP C 22PF J	K,P,M
C215,216			CK73HB1E103K	CHIP C 0.010UF K		C258			CC73HCH1H220J	CHIP C 22PF J	K3
C219			CC73HCH1H010B	CHIP C 1.0PF B	K,P,M	C258			CC73HCH1H300J	CHIP C 30PF J	K2,M2
C219			CC73HCH1H010B	CHIP C 1.0PF B	K3	C259			CC73HCH1H020B	CHIP C 2.0PF B	K,P,M
C220			CC73HCH1H180J	CHIP C 18PF J		C259			CC73HCH1H1R5B	CHIP C 1.5PF B	K2,K3,M2
C222			CK73HB1H471K	CHIP C 470PF K		C260			CK73HB1H471K	CHIP C 470PF K	
C223			CK73HB1E103K	CHIP C 0.010UF K		C261			CC73HCH1H020B	CHIP C 2.0PF B	K3
C224			CK73HB1A104K	CHIP C 0.10UF K		C261			CC73HCH1H030B	CHIP C 3.0PF B	K,P,M
C225			CK73HB1E103K	CHIP C 0.010UF K		C261			CC73HCH1H1R5B	CHIP C 1.5PF B	K2,M2
C226			CK73HB1H471K	CHIP C 470PF K		C262			CC73HCH1H220J	CHIP C 22PF J	K,P,M
C227			CC73HCH1H180J	CHIP C 18PF J		C262			CC73HCH1H220J	CHIP C 22PF J	K3
C228			CK73HB1H471K	CHIP C 470PF K		C262			CC73HCH1H300J	CHIP C 30PF J	K2,M2
C230			CK73HB1E103K	CHIP C 0.010UF K		C263			CC73HCH1H010B	CHIP C 1.0PF B	K,P,M
C231			CK73HB1H102K	CHIP C 1000PF K	K3	C263			CC73HCH1H020B	CHIP C 2.0PF B	K2,M2
C231			CK73HB1H471K	CHIP C 470PF K	K,P,M	C263			CC73HCH1H060B	CHIP C 6.0PF B	K3
C231			CK73HB1H471K	CHIP C 470PF K	K2,M2	C264			CC73HCH1H020B	CHIP C 2.0PF B	K3

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C264			CC73HCH1H220J	CHIP C 22PF J	K2,M2	C383-385			CK73HB1A104K	CHIP C 0.10UF K	
C264			CC73HCH1H3R5B	CHIP C 3.5PF B	K,P,M	C386			CK73HB1E103K	CHIP C 0.010UF K	
C265			CC73HCH1H030B	CHIP C 3.0PF B	K,P,M	C388,389			CK73HB1H471K	CHIP C 470PF K	
C265			CC73HCH1H050B	CHIP C 5.0PF B	K3	C390,391			CK73GB1A105K	CHIP C 1.0UF K	
C265			CC73HCH1H080B	CHIP C 8.0PF B	K2,M2	C392			CK73HB1A473K	CHIP C 0.047UF K	
C266			CC73HCH1H050B	CHIP C 5.0PF B	K,P,M	C393			CK73FB0J106K	CHIP C 10UF K	
C266			CC73HCH1H060B	CHIP C 6.0PF B	K2,M2	C395			CC73HCH1H221J	CHIP C 220PF J	
C266			CC73HCH1H070B	CHIP C 7.0PF B	K3	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	
C307			CC73HCH1H101J	CHIP C 100PF J		C405			CC73HCH1H221J	CHIP C 220PF J	
C310			CK73GB1A105K	CHIP C 1.0UF K		C408			CK73HB1H471K	CHIP C 470PF K	K2,M2
C311			CC73HCH1H101J	CHIP C 100PF J		C408,409			CK73HB1H471K	CHIP C 470PF K	K,P,M
C312			CK73HB1H471K	CHIP C 470PF K		C408,409			CK73HB1H471K	CHIP C 470PF K	K3
C313			CC73HCH1H101J	CHIP C 100PF J		C411			CK73HB1H471K	CHIP C 470PF K	K,P,M
C315			CC73HCH1H101J	CHIP C 100PF J		C413-415			CK73HB1H471K	CHIP C 470PF K	
C316			CK73HB1H471K	CHIP C 470PF K		TC1,2			C05-0384-05	CERAMIC TRIMMER CAP (10PF)	
C318			CK73HB1E103K	CHIP C 0.010UF K		CN301			E40-6573-05	FLAT CABLE CONNECTOR	
C319			CK73HB1H102K	CHIP C 1000PF K		J301			E11-0703-05	PHONE JACK (2.5/3.5)	
C320			CC73HCH1H101J	CHIP C 100PF J		F301			F53-0324-05	FUSE(2.5A)	
C321			CK73GB1A105K	CHIP C 1.0UF K		101	2A		J30-1282-14	SPACER	
C322			CC73HCH1H101J	CHIP C 100PF J		CD201			L79-1866-05	TUNING COIL	
C323			CK73GB1A105K	CHIP C 1.0UF K		CF201	2A		L72-0973-05	CERAMIC FILTER	
C325			CC73HCH1H101J	CHIP C 100PF J		L1			L92-0138-05	CHIP FERRITE	
C327			CK73HB1H471K	CHIP C 470PF K		L2			L40-4791-86	SMALL FIXED INDUCTOR (4.7UH)	
C331			CK73HB1A104K	CHIP C 0.10UF K		L4			L40-5681-86	SMALL FIXED INDUCTOR (0.56UH)	
C332			CC73HCH1H050B	CHIP C 5.0PF B		L6			L40-5681-86	SMALL FIXED INDUCTOR (0.56UH)	
C334			CK73HB1E103K	CHIP C 0.010UF K		L7			L92-0138-05	CHIP FERRITE	
C335			CK73FB0J106K	CHIP C 10UF K		L8			L40-1875-71	SMALL FIXED INDUCTOR (18NH)	
C337			CC73HCH1H050B	CHIP C 5.0PF B		L9			L92-0470-05	CHIP FERRITE	
C339			CK73GB1A105K	CHIP C 1.0UF K		L10,11			L40-1885-92	SMALL FIXED INDUCTOR (180NH)	
C341			CK73HB1H471K	CHIP C 470PF K		L12			L40-1875-71	SMALL FIXED INDUCTOR (18NH)	
C353-355			CK73HB1E103K	CHIP C 0.010UF K		L13,14			L40-1885-92	SMALL FIXED INDUCTOR (180NH)	
C356			CK73HB1H102K	CHIP C 1000PF K		L15			L40-2278-67	SMALL FIXED INDUCTOR (22NH)	K2,M2
C358			CK73GB1C224K	CHIP C 0.22UF K		L15			L40-2778-67	SMALL FIXED INDUCTOR (27NH)	K,P,M
C359			CK73FB0J106K	CHIP C 10UF K		L15			L40-2778-67	SMALL FIXED INDUCTOR (27NH)	K3
C360			CK73HB1A104K	CHIP C 0.10UF K		L16			L40-1878-67	SMALL FIXED INDUCTOR (18NH)	K,P,M
C361			CK73GB1A105K	CHIP C 1.0UF K		L16			L40-1878-67	SMALL FIXED INDUCTOR (18NH)	K2,M2
C362			CK73HB1H471K	CHIP C 470PF K		L16			L40-2278-67	SMALL FIXED INDUCTOR (22NH)	K3
C363			CC73HCH1H820J	CHIP C 82PF J		L17,18			L41-2785-45	SMALL FIXED INDUCTOR (270NH)	
C364			CC73HCH1H120J	CHIP C 12PF J		L19,20			L40-1885-92	SMALL FIXED INDUCTOR (180NH)	
C365			CC73HCH1H820J	CHIP C 82PF J		L21			L92-0138-05	CHIP FERRITE	
C366			CK73HB1A104K	CHIP C 0.10UF K		L22,23			L40-2275-71	SMALL FIXED INDUCTOR (22NH)	
C367			CK73GB1A105K	CHIP C 1.0UF K		L101			L40-1875-71	SMALL FIXED INDUCTOR (18NH)	
C368			CK73HB1H271K	CHIP C 270PF K		L102			L40-2775-71	SMALL FIXED INDUCTOR (27NH)	K3
C369,370			CK73HB1A104K	CHIP C 0.10UF K		L102			L40-3975-71	SMALL FIXED INDUCTOR (39NH)	K,P,M
C371			CK73FB0J106K	CHIP C 10UF K		L102			L40-3975-71	SMALL FIXED INDUCTOR (39NH)	
C372			CK73HB1H471K	CHIP C 470PF K		L102			L40-3975-71	SMALL FIXED INDUCTOR (39NH)	
C373			CC73HCH1H121J	CHIP C 120PF J		L102			L40-3975-71	SMALL FIXED INDUCTOR (39NH)	
C374			CK73HB1H102K	CHIP C 1000PF K		L103			L40-1575-71	SMALL FIXED INDUCTOR (15NH)	K,P,M
C375,376			CK73HB1H471K	CHIP C 470PF K		L103			L40-1875-71	SMALL FIXED INDUCTOR (18NH)	K3
C377			CK73HB1A683K	CHIP C 0.068UF K		L103			L40-2275-71	SMALL FIXED INDUCTOR (22NH)	K2,M2
C378			CC73HCH1H820J	CHIP C 82PF J		L104			L40-3368-71	SMALL FIXED INDUCTOR (3.3NH)	K2,M2
C379,380			CK73GB1A105K	CHIP C 1.0UF K		L104			L40-8265-71	SMALL FIXED INDUCTOR (8.2NH)	K,P,M
C381			CK73HB1H391K	CHIP C 390PF K		L104			L40-8265-71	SMALL FIXED INDUCTOR (8.2NH)	K3
C382			CK73HB1C153K	CHIP C 0.015UF K							

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

## PARTS LIST

## TX-RX UNIT (X57-7580-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
L105			L41-2278-45	SMALL FIXED INDUCTOR (22NH)	K,P,M	R11			RK73HB1J274J	CHIP R 270K J 1/16W	K,P,M
L105			L41-2278-45	SMALL FIXED INDUCTOR (22NH)	K2,M2	R11			RK73HB1J274J	CHIP R 270K J 1/16W	K3
L105			L41-4765-45	SMALL FIXED INDUCTOR (4.7NH)	K3	R11			RK73HB1J334J	CHIP R 330K J 1/16W	K2,M2
L106			L92-0472-05	CHIP FERRITE		R12			RK73HB1J221J	CHIP R 220 J 1/16W	
L107			L40-2263-92	SMALL FIXED INDUCTOR (2.2NH)	K3	R13			RK73HB1J101J	CHIP R 100 J 1/16W	
L107			L40-2763-92	SMALL FIXED INDUCTOR (2.7NH)	K,P,M	R14			RK73HB1J100J	CHIP R 10 J 1/16W	
L107			L40-8265-92	SMALL FIXED INDUCTOR (8.2NH)	K2,M2	R15			RK73HB1J561J	CHIP R 560 J 1/16W	
L108			L34-4603-15	AIR-CORE COIL	K,P,M	R16			RK73HB1J000J	CHIP R 0.0 J 1/16W	K,P,M
L108			L34-4603-15	AIR-CORE COIL	K3	R16			RK73HB1J181J	CHIP R 180 J 1/16W	K2,K3,M2
L108			L34-4604-15	AIR-CORE COIL	K2,M2	R17			RK73HB1J122J	CHIP R 1.2K J 1/16W	K2,K3,M2
L109			L92-0472-05	CHIP FERRITE		R17			RK73HB1J182J	CHIP R 1.8K J 1/16W	K,P,M
L111			L41-2785-45	SMALL FIXED INDUCTOR (270NH)		R18			RK73HB1J681J	CHIP R 680 J 1/16W	
L112			L34-4572-05	AIR-CORE COIL		R19			RK73HB1J223J	CHIP R 22K J 1/16W	
L113-115			L34-4564-05	AIR-CORE COIL		R20			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L116			L41-1092-44	SMALL FIXED INDUCTOR (1UH)		R21,22			RK73HB1J103J	CHIP R 10K J 1/16W	
L201			L40-1091-86	SMALL FIXED INDUCTOR (1.0UH)		R23			RK73HB1J470J	CHIP R 47 J 1/16W	K3
L202			L92-0138-05	CHIP FERRITE		R26			RK73HB1J333J	CHIP R 33K J 1/16W	
L203			L41-5685-39	SMALL FIXED INDUCTOR (0.56UH)		R27			RK73HB1J684J	CHIP R 680K J 1/16W	
L204			L40-1885-92	SMALL FIXED INDUCTOR (180NH)		R28			RK73HB1J102J	CHIP R 1.0K J 1/16W	
L205			L40-2775-71	SMALL FIXED INDUCTOR (27NH)	K,P,M	R29			RK73HB1J154J	CHIP R 150K J 1/16W	
L205			L40-2775-71	SMALL FIXED INDUCTOR (27NH)	K2,M2	R30			RK73HB1J273J	CHIP R 27K J 1/16W	
L205			L40-3375-71	SMALL FIXED INDUCTOR (33NH)	K3	R31			RK73HB1J274J	CHIP R 270K J 1/16W	
L206,207			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)		R32			RK73HB1J394J	CHIP R 390K J 1/16W	K3
L208			L92-0138-05	CHIP FERRITE		R32			RK73HB1J474J	CHIP R 470K J 1/16W	K,P,M
L209			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)		R32			RK73HB1J474J	CHIP R 470K J 1/16W	K2,M2
L210			L41-2785-45	SMALL FIXED INDUCTOR (270NH)		R33			RK73HB1J100J	CHIP R 10 J 1/16W	K3
L212			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)	K2,M2	R33			RK73HB1J101J	CHIP R 100 J 1/16W	K2,M2
L212,213			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)	K,P,M	R33-36			RK73HB1J101J	CHIP R 100 J 1/16W	K,P,M
L212,213			L41-8268-14	SMALL FIXED INDUCTOR (8.2NH)	K3	R34			RK73HB1J181J	CHIP R 180 J 1/16W	K2,M2
L213			L41-3963-14	SMALL FIXED INDUCTOR (3.9NH)	K2,M2	R34-36			RK73HB1J101J	CHIP R 100 J 1/16W	K3
L214			L41-4775-45	SMALL FIXED INDUCTOR (47NH)	K,P,M	R35			RK73HB1J820J	CHIP R 82 J 1/16W	K2,M2
L214			L41-4775-45	SMALL FIXED INDUCTOR (47NH)	K3	R36			RK73HB1J101J	CHIP R 100 J 1/16W	K2,M2
L215			L41-3963-14	SMALL FIXED INDUCTOR (3.9NH)	K2,M2	R37			RK73HB1J472J	CHIP R 4.7K J 1/16W	
L250			L40-1875-71	SMALL FIXED INDUCTOR (18NH)		R38			RK73HB1J154J	CHIP R 150K J 1/16W	
L301			L92-0472-05	CHIP FERRITE		R39			RK73HB1J101J	CHIP R 100 J 1/16W	
L302-304			L92-0138-05	CHIP FERRITE		R40			RK73HB1J472J	CHIP R 4.7K J 1/16W	K,P,M
L305			L92-0140-05	CHIP FERRITE		R40			RK73HB1J472J	CHIP R 4.7K J 1/16W	K2,M2
X1			L77-3042-05	TCXO (12.8MHZ)		R41			RK73HB1J562J	CHIP R 5.6K J 1/16W	
X301			L78-1433-05	RESONATOR (14.746MHZ)		R42			RK73HB1J220J	CHIP R 22 J 1/16W	
XF201			L71-0619-05	MCF (38.85MHZ/6.5KH)		R43			RK73HB1J471J	CHIP R 470 J 1/16W	
CP1			RK75HA1J101J	CHIP-COM 100 J 1/16W		R45			RK73HB1J562J	CHIP R 5.6K J 1/16W	
CP201			RK75HA1J104J	CHIP-COM 100K J 1/16W		R101			RK73HB1J332J	CHIP R 3.3K J 1/16W	
CP202			RK75HA1J474J	CHIP-COM 470K J 1/16W		R102			RK73HB1J273J	CHIP R 27K J 1/16W	
CP203			RK75HA1J104J	CHIP-COM 100K J 1/16W		R103			RK73HB1J331J	CHIP R 330 J 1/16W	
CP204			RK75HA1J474J	CHIP-COM 470K J 1/16W		R104			RK73HB1J390J	CHIP R 39 J 1/16W	K3
CP301,302			RK75HA1J473J	CHIP-COM 47K J 1/16W		R104			RK73HB1J470J	CHIP R 47 J 1/16W	K,P,M
CP303,304			RK75HA1J102J	CHIP-COM 1.0K J 1/16W		R104			RK73HB1J470J	CHIP R 47 J 1/16W	K2,M2
R1			RK73HB1J223J	CHIP R 22K J 1/16W		R105			RK73HB1J183J	CHIP R 18K J 1/16W	K3
R2			RK73HB1J103J	CHIP R 10K J 1/16W		R105			RK73HB1J273J	CHIP R 27K J 1/16W	K,P,M
R3			RK73HB1J154J	CHIP R 150K J 1/16W	K3	R105			RK73HB1J273J	CHIP R 27K J 1/16W	K2,M2
R3			RK73HB1J184J	CHIP R 180K J 1/16W	K,P,M	R106			RK73HB1J331J	CHIP R 330 J 1/16W	
R3			RK73HB1J184J	CHIP R 180K J 1/16W	K2,M2	R107			RK73HB1J390J	CHIP R 39 J 1/16W	K3
R4			RK73HB1J563J	CHIP R 56K J 1/16W		R107			RK73HB1J560J	CHIP R 56 J 1/16W	K,P,M
R5			RK73HB1J104J	CHIP R 100K J 1/16W		R107			RK73HB1J560J	CHIP R 56 J 1/16W	K2,M2
R7			RK73HB1J000J	CHIP R 0.0 J 1/16W		R109			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R8			RK73HB1J101J	CHIP R 100 J 1/16W		R111			RK73HB1J393J	CHIP R 39K J 1/16W	K,P,M
R9			RK73HB1J222J	CHIP R 2.2K J 1/16W	K2,M2	R111			RK73HB1J393J	CHIP R 39K J 1/16W	K2,M2
R9			RK73HB1J821J	CHIP R 820 J 1/16W	K,P,M	R111			RK73HB1J473J	CHIP R 47K J 1/16W	K3
R9			RK73HB1J821J	CHIP R 820 J 1/16W	K3	R112			RK73HB1J220J	CHIP R 22 J 1/16W	
R10			RK73HB1J000J	CHIP R 0.0 J 1/16W		R113			RK73HB1J104J	CHIP R 100K J 1/16W	

## PARTS LIST

## TX-RX UNIT (X57-7580-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R114			RK73HB1J822J	CHIP R 8.2K J 1/16W		R222			RK73HB1J150J	CHIP R 15 J 1/16W	K3
R116			RK73HB1J331J	CHIP R 330 J 1/16W	K,P,M	R222			RK73HB1J220J	CHIP R 22 J 1/16W	K,P,M
R116			RK73HB1J331J	CHIP R 330 J 1/16W	K2,M2	R222			RK73HB1J220J	CHIP R 22 J 1/16W	K2,M2
R118			RK73HB1J000J	CHIP R 0.0 J 1/16W	K2,M2	R223			RK73HB1J121J	CHIP R 120 J 1/16W	K3
R118			RK73HB1J331J	CHIP R 330 J 1/16W	K3	R223			RK73HB1J221J	CHIP R 220 J 1/16W	K,P,M
R119			RK73GB2A000J	CHIP R 0.0 J 1/10W		R223			RK73HB1J221J	CHIP R 220 J 1/16W	K2,M2
R120			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R225			RK73HB1J683J	CHIP R 68K J 1/16W	
R121			RK73HB1J103J	CHIP R 10K J 1/16W	K,P,M	R226			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R121			RK73HB1J153J	CHIP R 15K J 1/16W	K3	R227			RK73FB2B000J	CHIP R 0.0 J 1/8W	K,P,M
R121			RK73HB1J472J	CHIP R 4.7K J 1/16W	K2,M2	R227			RK73FB2B000J	CHIP R 0.0 J 1/8W	K3
R122			RK73HB1J273J	CHIP R 27K J 1/16W	K,P,M	R228			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R122			RK73HB1J273J	CHIP R 27K J 1/16W	K2,M2	R229			RK73GB2A000J	CHIP R 0.0 J 1/10W	K2,M2
R122			RK73HB1J683J	CHIP R 68K J 1/16W	K3	R301			RK73HB1J474D	CHIP R 470K D 1/16W	
R123			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R302			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R124			RK73HB1J101J	CHIP R 100 J 1/16W	K3	R303			RK73HB1J101J	CHIP R 100 J 1/16W	
R124			RK73HB1J220J	CHIP R 22 J 1/16W	K,P,M	R304			RK73HB1J334J	CHIP R 330K J 1/16W	
R124			RK73HB1J220J	CHIP R 22 J 1/16W	K2,M2	R305			RK73HB1J474D	CHIP R 470K D 1/16W	
R125			RK73HB1J683J	CHIP R 68K J 1/16W		R306			RK73HB1J184J	CHIP R 180K J 1/16W	
R126			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R307			RK73GB2A271J	CHIP R 270 J 1/10W	
R127,128			RK73GH2A154D	CHIP R 150K D 1/10W		R308			RK73GB2A221J	CHIP R 220 J 1/10W	
R129,130			RK73GH2A334D	CHIP R 330K D 1/10W		R309,310			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R131			RK73HB1J105J	CHIP R 1.0M J 1/16W		R313			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R132			RK73HB1J473J	CHIP R 47K J 1/16W		R314,315			RK73HB1J103J	CHIP R 10K J 1/16W	
R133			RK73HB1J000J	CHIP R 0.0 J 1/16W		R316			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R134			RK73HB1J563J	CHIP R 56K J 1/16W		R317			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R135			RK73HB1J104J	CHIP R 100K J 1/16W	K2,K3,M2	R318			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R135			RK73HB1J184J	CHIP R 180K J 1/16W	K,P,M	R319			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R136			RK73HB1J474J	CHIP R 470K J 1/16W		R320			RK73HB1J123J	CHIP R 12K J 1/16W	
R137			RK73FB2B000J	CHIP R 0.0 J 1/8W		R321			RK73HB1J103J	CHIP R 10K J 1/16W	
R138			RK73GB2A151J	CHIP R 150 J 1/10W		R322,323			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R140			RK73GB2A000J	CHIP R 0.0 J 1/10W		R324,325			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R141			RK73HB1J000J	CHIP R 0.0 J 1/16W		R340-342			RK73HB1J103J	CHIP R 10K J 1/16W	
R201			RK73HB1J184J	CHIP R 180K J 1/16W	K3	R344			RK73HB1J474J	CHIP R 470K J 1/16W	
R201			RK73HB1J823J	CHIP R 82K J 1/16W	K,P,M	R345			RK73HB1J273J	CHIP R 27K J 1/16W	
R201			RK73HB1J823J	CHIP R 82K J 1/16W	K2,M2	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	K,P,M	R355			RK73HB1J124J	CHIP R 120K J 1/16W	
R210			RK73HB1J392J	CHIP R 3.9K J 1/16W	K2,M2	R356			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R210			RK73HB1J472J	CHIP R 4.7K J 1/16W	K3	R357			RK73HB1J563J	CHIP R 56K J 1/16W	
R211			RK73HB1J101J	CHIP R 100 J 1/16W		R358			RK73HB1J474J	CHIP R 470K J 1/16W	
R212			RK73HB1J184J	CHIP R 180K J 1/16W	K2,M2	R359			RK73HB1J473J	CHIP R 47K J 1/16W	
R212			RK73HB1J224J	CHIP R 220K J 1/16W	K,P,M	R360			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R212			RK73HB1J224J	CHIP R 220K J 1/16W	K3	R361			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R213			RK73HB1J391J	CHIP R 390 J 1/16W		R362			RK73HB1J184J	CHIP R 180K J 1/16W	
R214			RK73HB1J331J	CHIP R 330 J 1/16W		R363,364			RK73HB1J104J	CHIP R 100K J 1/16W	
R215			RK73HB1J332J	CHIP R 2.2K J 1/16W		R365			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R216			RK73HB1J151J	CHIP R 150 J 1/16W		R366			RK73HB1J154J	CHIP R 150K J 1/16W	
R217			RK73HB1J332J	CHIP R 3.3K J 1/16W		R367			RK73HB1J393J	CHIP R 39K J 1/16W	
R218			RK73HB1J823J	CHIP R 82K J 1/16W	K3	R368			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R218,219			RK73HB1J563J	CHIP R 56K J 1/16W	K,P,M	R369			RK73HB1J823J	CHIP R 82K J 1/16W	
R218,219			RK73HB1J563J	CHIP R 56K J 1/16W	K2,M2	R370			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R219			RK73HB1J563J	CHIP R 56K J 1/16W	K3	R371			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R220			RK73HB1J000J	CHIP R 0.0 J 1/16W		R372			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R221			RK73HB1J105J	CHIP R 1.0M J 1/16W		R373			RK73HB1J224J	CHIP R 220K J 1/16W	

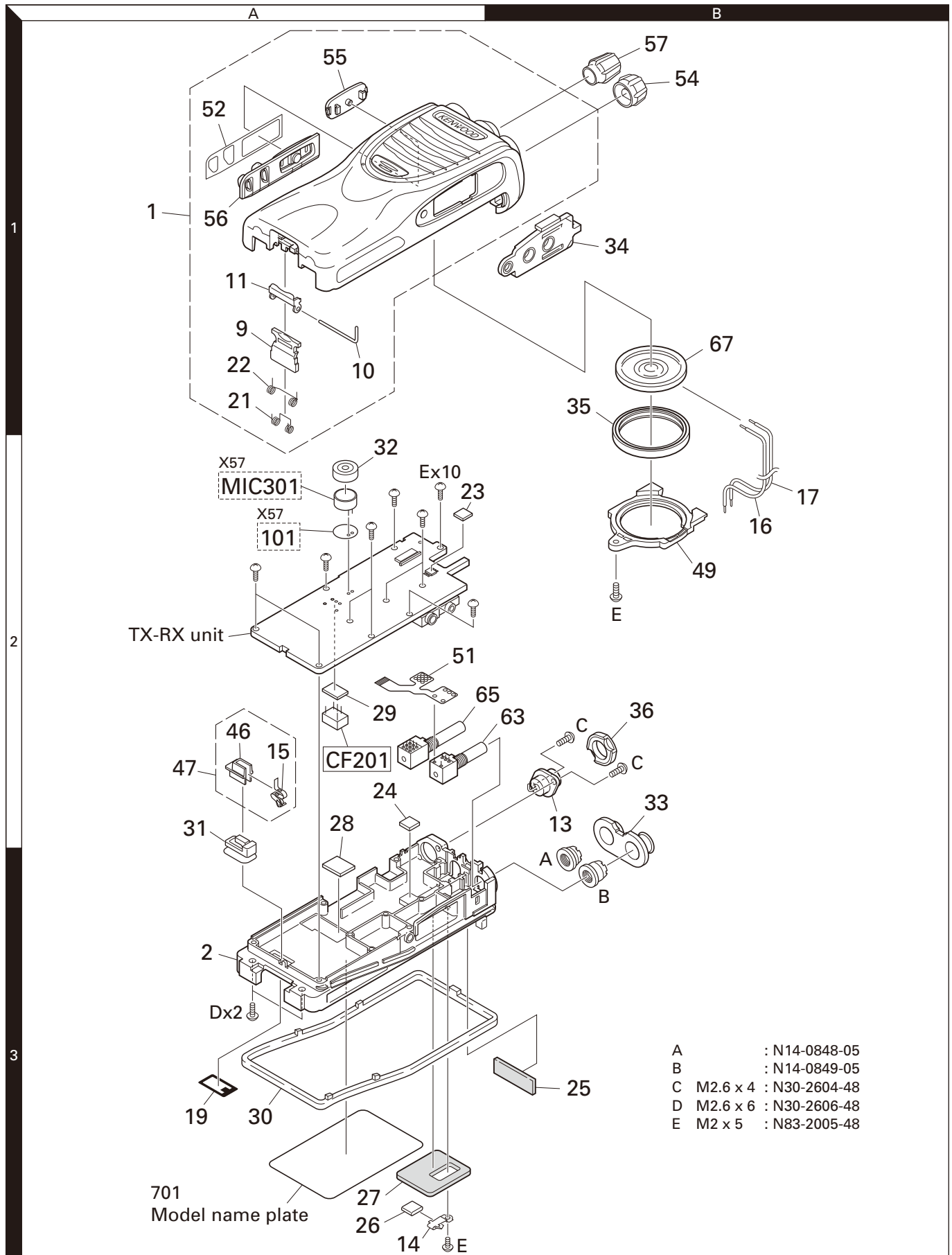
## PARTS LIST

## TX-RX UNIT (X57-7580-XX)

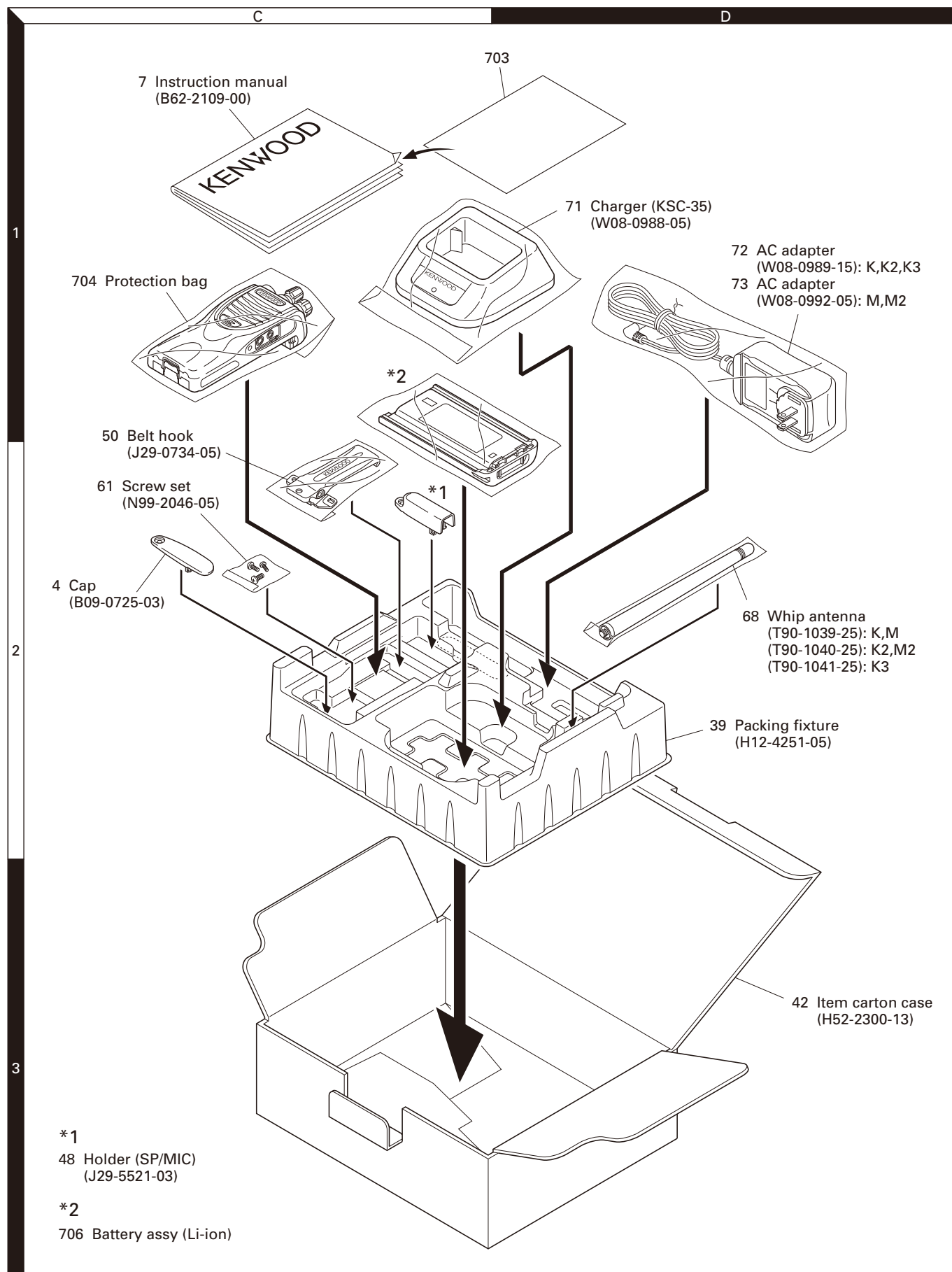
Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
R374	2A		RK73HB1J153J	CHIP R 15K J 1/16W	K2,K3,M2 K,P,M K2,K3,M2	Q102			2SC4926YD	TRANSISTOR	K,P,M K2,K3,M2
R375			RK73HB1J182J	CHIP R 1.8K J 1/16W		Q102			2SC5455-A	TRANSISTOR	
R376			RK73HB1J471J	CHIP R 470 J 1/16W		Q103			ROA0004PXDQS	FET	
R377			RK73HB1J473J	CHIP R 47K J 1/16W		Q104			RT1N441U	TRANSISTOR	
R378			RK73HB1J561J	CHIP R 560 J 1/16W		Q106			RD07MVS1BT122	FET	
R379			RK73HB1J102J	CHIP R 1.0K J 1/16W		Q107			RT1N441U	TRANSISTOR	
R380			RK73HB1J474J	CHIP R 470K J 1/16W		Q108			2SK1824-A	FET	
R381			RK73HB1J151J	CHIP R 150 J 1/16W		Q109			RT1P441U	TRANSISTOR	
R383			RK73HB1J563J	CHIP R 56K J 1/16W		Q201			RT1P441U	TRANSISTOR	
R384			RK73HB1J333J	CHIP R 33K J 1/16W		Q202			2SC4774	TRANSISTOR	
R385			RK73GB2A101J	CHIP R 100 J 1/10W		Q203,204			3SK318	FET	
R387			RK73HB1J104J	CHIP R 100K J 1/16W		Q301,302			RT1N441U	TRANSISTOR	
R388			RK73HB1J101J	CHIP R 100 J 1/16W		Q303			RT1P141U	TRANSISTOR	
R389			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q304			DTB723YE	DIGITAL TRANSISTOR	
R390			RK73GB2A000J	CHIP R 0.0 J 1/10W		Q305,306			2SC4919	TRANSISTOR	
R391			RK73HB1J102J	CHIP R 1.0K J 1/16W		Q307			RT1N441U	TRANSISTOR	
R393			RK73GB2A000J	CHIP R 0.0 J 1/10W		Q308			KTC4075E(Y,GR)	TRANSISTOR	
R394			RK73HB1J473J	CHIP R 47K J 1/16W		Q310			2SC4116(GR)F	TRANSISTOR	
R398			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q311			2SA1586(Y,GR)F	TRANSISTOR	
VR1			R32-0736-05	SEMI FIXED VARIABLE RESISTOR		Q312			RT1N441U	TRANSISTOR	
S1-3			S70-0414-05	TACT SWITCH		Q313			2SB1694	TRANSISTOR	
MIC301			T91-0651-15	MIC ELEMENT		Q314			RT1N441U	TRANSISTOR	
D3,4			1SV325F	VARIABLE CAPACITANCE DIODE		Q315,316			2SK3577-A	FET	
D6			1SV325F	VARIABLE CAPACITANCE DIODE		TH101			B57331V2104J	THERMISTOR	
D8			1SV325F	VARIABLE CAPACITANCE DIODE		TH201			B57331V2104J	THERMISTOR	
D9			KDV214E-P	DIODE							
D10			MC2858	DIODE							
D101			UDZW5.1(B)	ZENER DIODE							
D103			HSC277	DIODE							
D104			HVC131	DIODE							
D104,105			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							
IC304			XC6209B502MR	MOS-IC							
IC305			BR24L16F-VV	ROM IC							
IC306		*	R5F212CCKCMB	MICRO CONTROL UNIT							
IC308			AQUA-L	MOS-IC							
IC309			TA7368FG	MOS-IC							
Q1			KTC4075E(Y,GR)	TRANSISTOR							
Q2			2SC4774	TRANSISTOR							
Q3			2SC5636	TRANSISTOR							
Q4,5			2SK1875-F(V)	FET							
Q6			KTC4075E(Y,GR)	TRANSISTOR							
Q7,8			RT1P430U	TRANSISTOR							
Q9			2SC5636	TRANSISTOR							
Q10			KTC4075E(Y,GR)	TRANSISTOR							
Q11			2SC5636	TRANSISTOR							
Q101			2SC5636	TRANSISTOR							



## EXPLODED VIEW



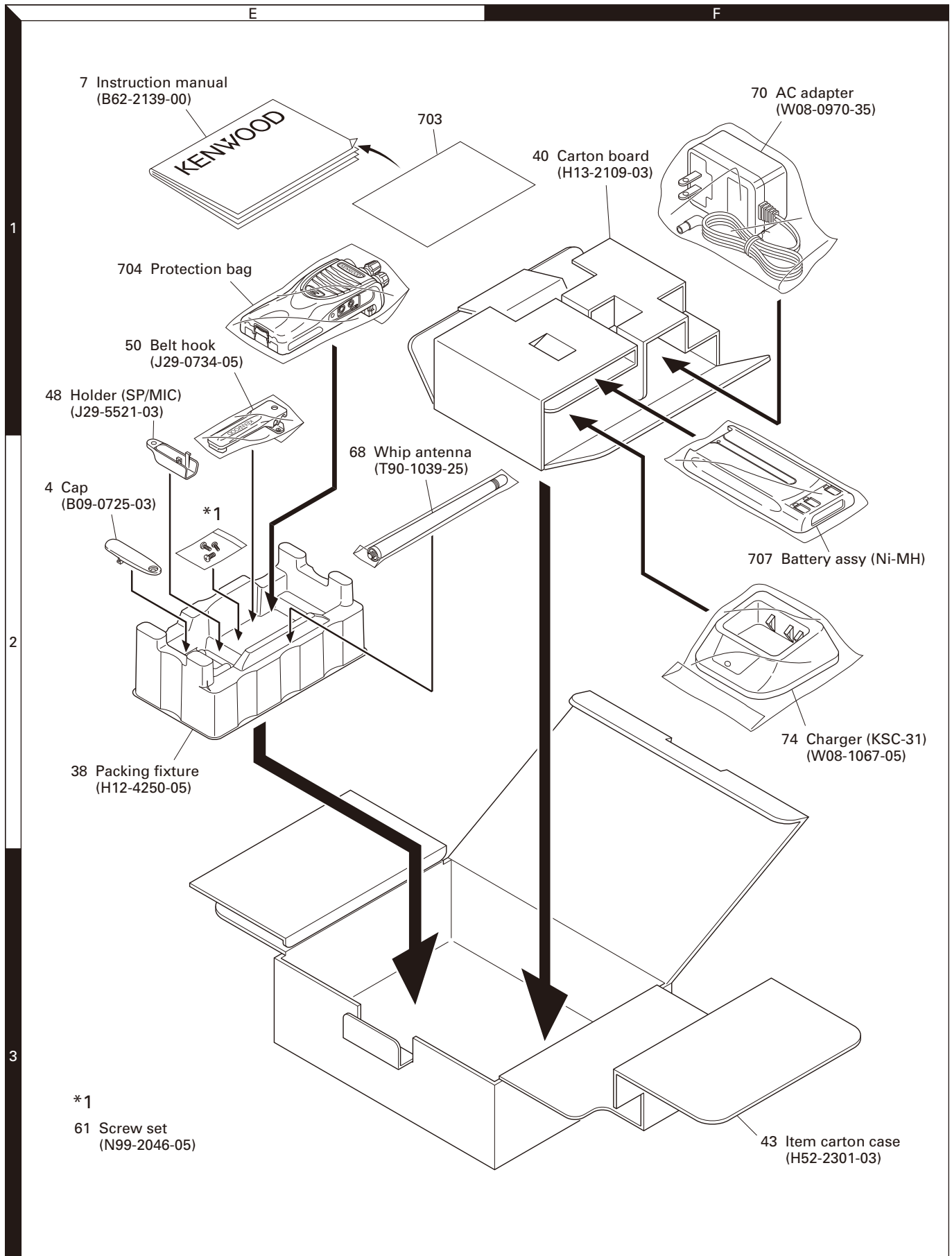
## PACKING (K2,K3,M2 TYPE)



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



## PACKING (P 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. 4Ω Dummy Load		Approx. 4Ω, 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)

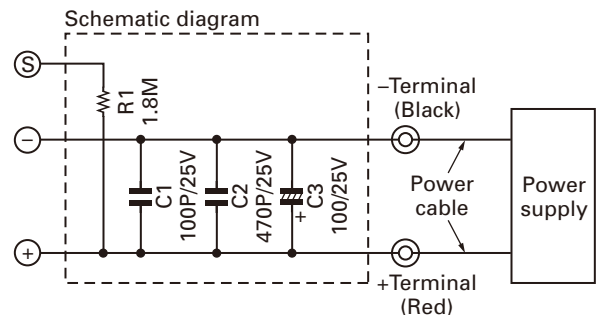
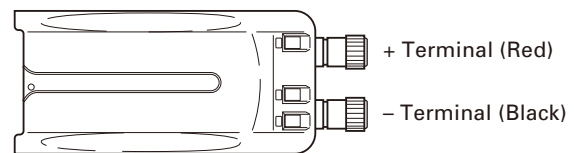
Use jig (part No.: A10-4215-03) for repairing the transceiver. Place the TX-RX unit on the jig and fit it with screws.

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 K2,M2

Channel No.	RX Frequency	TX Frequency
1	495.050	495.100
2	470.050	470.100
3	519.950	519.900
4	495.000	495.000
5	495.200	495.200
6	495.400	495.400
7~16	-	-

#### • TK-3302 K3

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
8	DTMF Decode [159D]	DTMF Encode [159D]
9	None	DTMF Tone 9

## 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  $8\Omega$  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 K2,M2	
	RX	TX
Center	495.050MHz	495.100MHz
Low	470.050MHz	470.100MHz
High	519.950MHz	519.900MHz
Low'	482.550MHz	482.600MHz
High'	507.550MHz	507.600MHz

TEST CH	TK-3302 K3	
	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	K2,K3,M2	KPG-118D(K)

## ADJUSTMENT

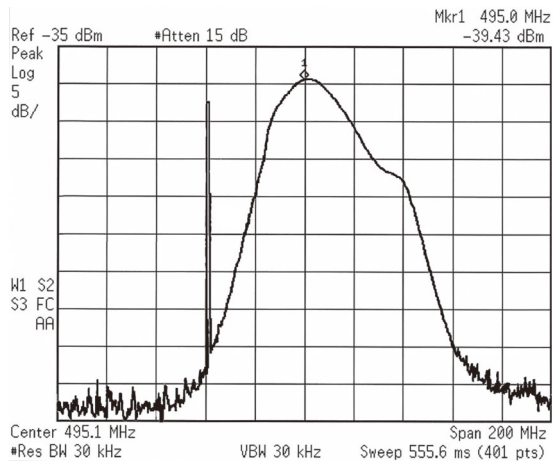


Fig. 1 Center frequency: K2,M2

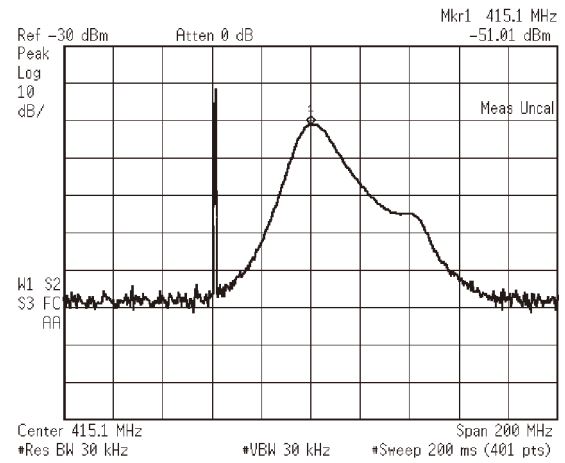


Fig. 4 Center frequency: K3

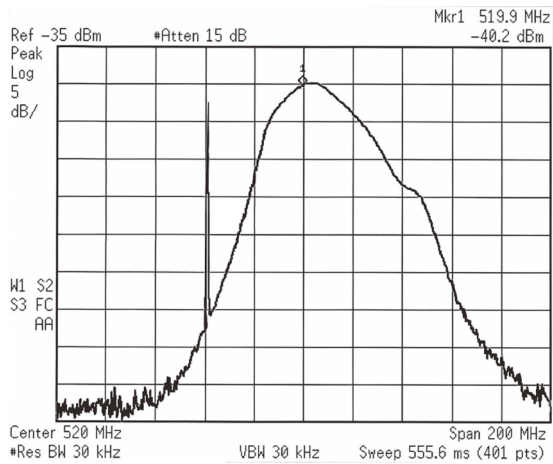


Fig. 2 High-edge frequency: K2,M2

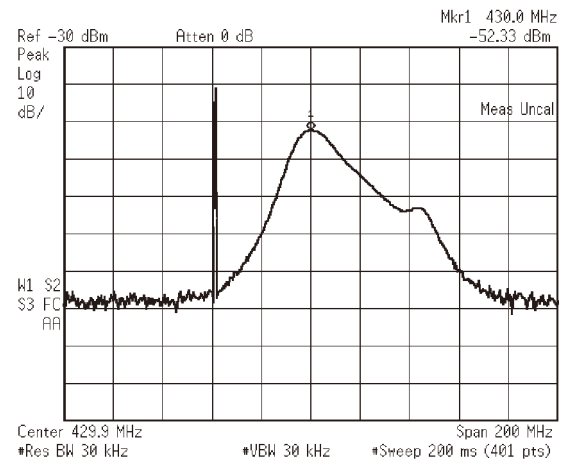


Fig. 5 High-edge frequency: K3

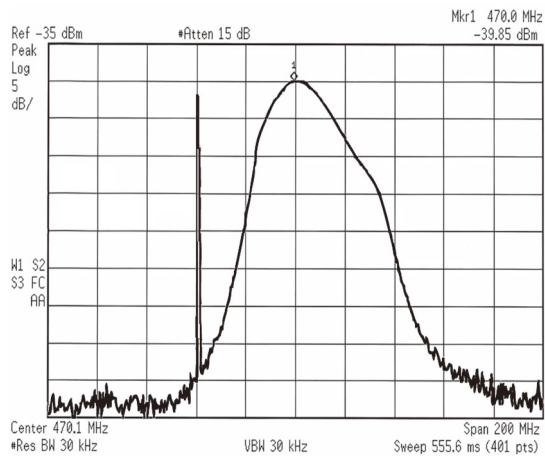


Fig. 3 Low-edge frequency: K2,M2

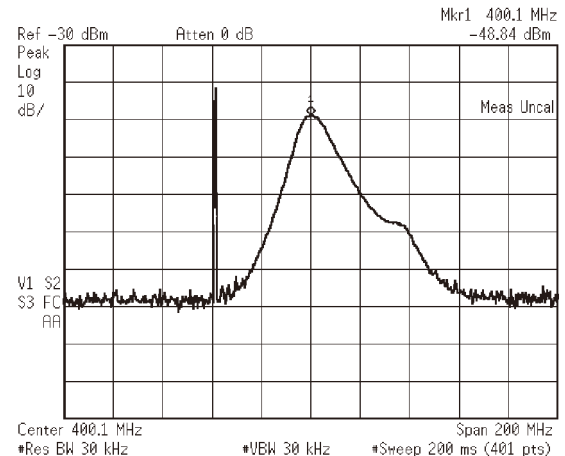



Fig. 6 Low-edge frequency: K3

## 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	1) CH: High	Power meter DVM	TX-RX	ANT LV (CV)	TX-RX	TC1	4.0V <b>K2,M2</b> 3.5V <b>K3</b>	±0.1V
	2) CH: Low						Check	0.6V or more
3. VCO lock voltage TX	3) CH: High PTT: ON				TX-RX	TC2	3.7V <b>K2,M2</b> 3.5V <b>K3</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		ANT		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]	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					SP/MIC connector	4.4kHz (According to the larger +, -)
[Narrow]	2) TEST CH: Center PTT: ON				2.2kHz (According to the larger +, -)	±80Hz		
5. DQT Balance [Wide]	1) TEST CH: Center, Low, High (3 points) Deviation meter filter LPF: 3kHz HPF: OFF PTT: ON			Make the demodulation wave into square waves.				
[Narrow]	2) TEST CH: Center PTT: ON							

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. QT Fine Deviation [Wide]	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
[Narrow]	2) TEST CH: Center PTT: ON	AG AF VTVM		SP/MIC connector			0.38kHz	±40Hz
7. DQT Fine Deviation [Wide]	1) TEST CH: Center, Low, High (3 points) Deviation meter filter LPF: 3kHz HPF: OFF PTT: ON						0.75kHz	±40Hz
[Narrow]	2) TEST CH: Center PTT: ON						0.38kHz	±40Hz
8. DTMF Fine Deviation [Wide]	1) TEST CH: Center Deviation meter filter LPF: 15kHz HPF: OFF PTT: ON						3.0kHz	±100Hz
[Narrow]	2) TEST CH: Center PTT: ON						1.5kHz	±100Hz
9. MSK Fine Deviation [Wide]	1) TEST CH: Center Deviation meter filter LPF: 15kHz HPF: OFF PTT: ON						3.0kHz	±100Hz
[Narrow]	2) TEST CH: Center PTT: ON						1.5kHz	±100Hz

## Receiver Section

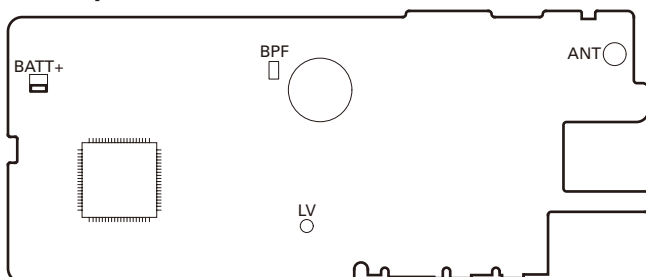
Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. BPF Wave Adjust <b>K2,M2</b>	1) Center frequency Spectrum analyzer setting Center-f: 495MHz Span: 200MHz RBW: 30kHz VBW: 30kHz ATT: 15dB 2) High-edge frequency Spectrum analyzer setting Center-f: 520MHz 3) Low-edge frequency Spectrum analyzer setting Center-f: 470MHz	SOG  Spectrum analyzer	TX-RX	ANT  BPF		FPU	Adjust the waveform as shown to the Fig. 1~3.	

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
<b>K3</b>	1) Center frequency Spectrum analyzer setting Center-f: 415MHz Span: 200MHz RBW: 30kHz VBW: 30kHz ATT: 0dB 2) High-edge frequency Spectrum analyzer setting Center-f: 430MHz 3) Low-edge frequency Spectrum analyzer setting Center-f: 400MHz	SSG  Spectrum analyzer	TX-RX	ANT  BPF		FPU	Adjust the waveform as shown to the Fig. 4~6.	
2. Sensitivity [Wide]	1) TEST CH: Low, Center, High (3 points) SSG output : -117dBm (0.3μV) SSG MOD: 3.0kHz	SSG  DVM Oscilloscope AF VTVM		ANT  SP/MIC connector			Check	12dB SINAD or more
[Narrow]	2) TEST CH: Center SSG output : -115dBm (0.4μV) SSG MOD: 1.5kHz							
3. Squelch Open [Wide]	1) TEST CH: Center, Low, High (3 points) SSG output : -123dBm (0.16μV) SSG MOD: 3.0kHz					FPU	Write	
[Narrow]	2) TEST CH: Center SSG output : -122dBm (0.18μV) SSG MOD: 1.5kHz							
4. Squelch Tight [Wide]	1) TEST CH: Center, Low, High (3 points) SSG output : -117dBm (0.3μV) SSG MOD: 3.0kHz							
[Narrow]	2) TEST CH: Center SSG output : -116dBm (0.35μV) 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

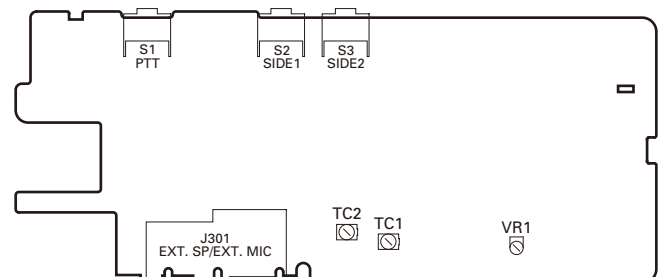
## Adjustment Points

## ■ Component side view



BPF: BPF Wave Adjust  
 LV (CV): VCO lock voltage  
 BATT+: Battery Warning Level

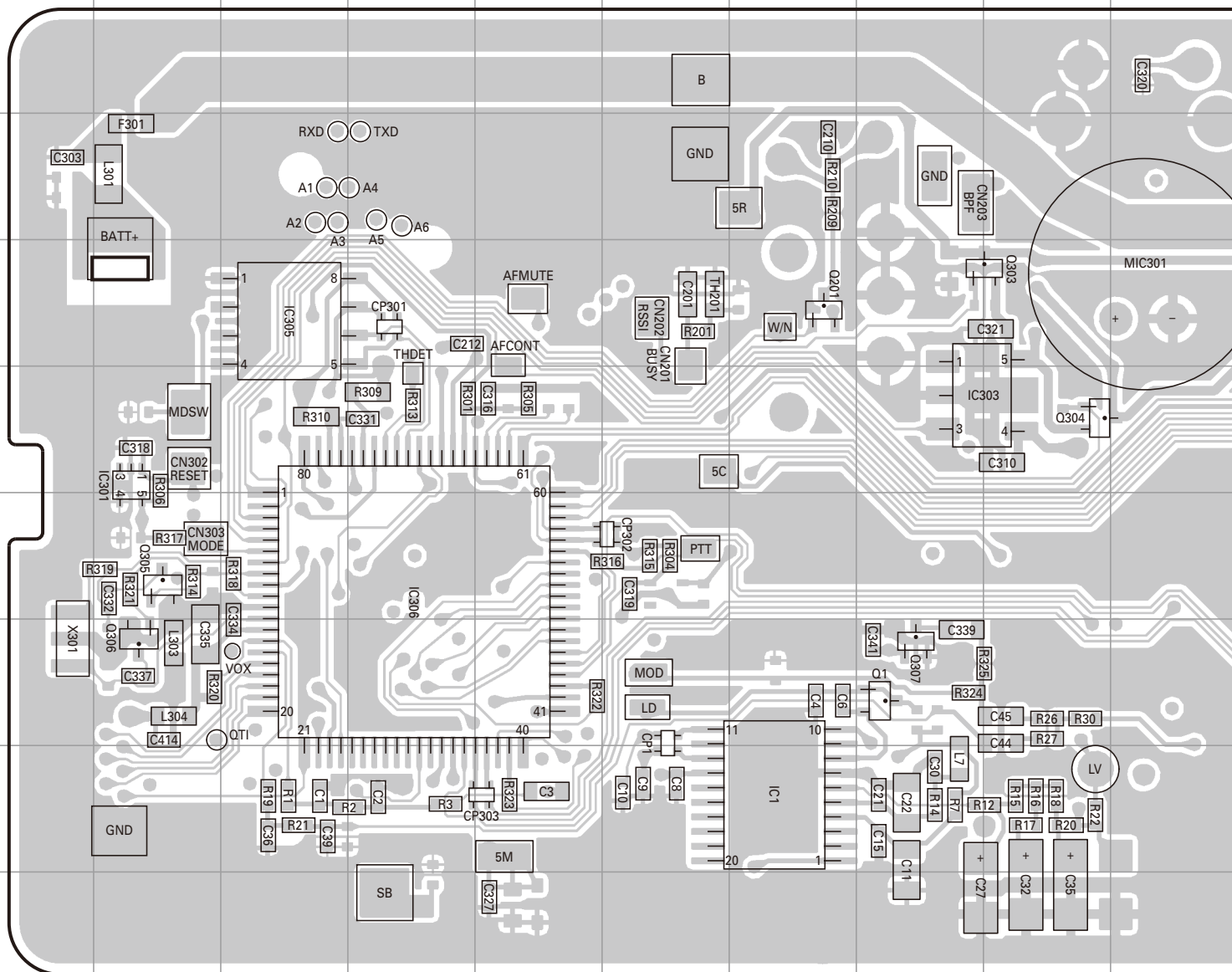
## ■ Foil side view



TC1 : VCO lock voltage (RX)  
 TC2 : VCO lock voltage (TX)  
 VR1 : Frequency adjustment

# TK-3302 PC BOARD

**TX-RX UNIT (X57-7580-XX) -22: K2,M2 -23: K3**  
**Component side view (J79-0187-09)**

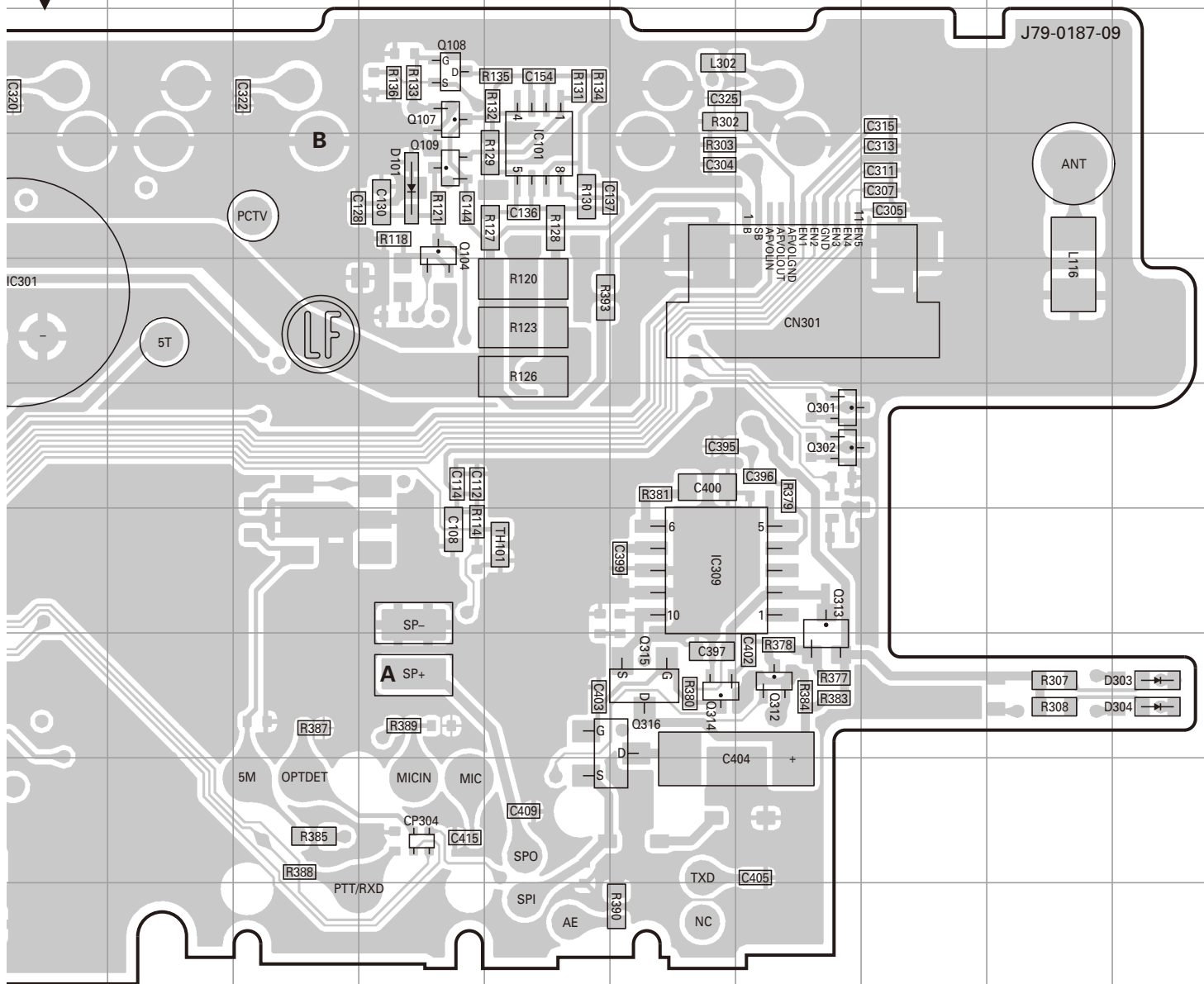


Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	9G	Q104	4M	Q304	6I	Q316	8O
IC101	4N	Q107	3M	Q305	7B	D101	4M
IC301	6B	Q108	3M	Q306	8B	D303	8S
IC303	6H	Q109	4M	Q307	8H	D304	8S
IC305	5C	Q201	5G	Q312	8P		
IC306	7D	Q301	6P	Q313	7P		
IC309	7O	Q302	6P	Q314	8O		
Q1	8H	Q303	5I	Q315	8O		



# PC BOARD TK-3302

**TX-RX UNIT (X57-7580-XX) -22: K2,M2 -23: K3**  
**Component side view (J79-0187-09)**



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

Component side

Layer 1

Layer 2

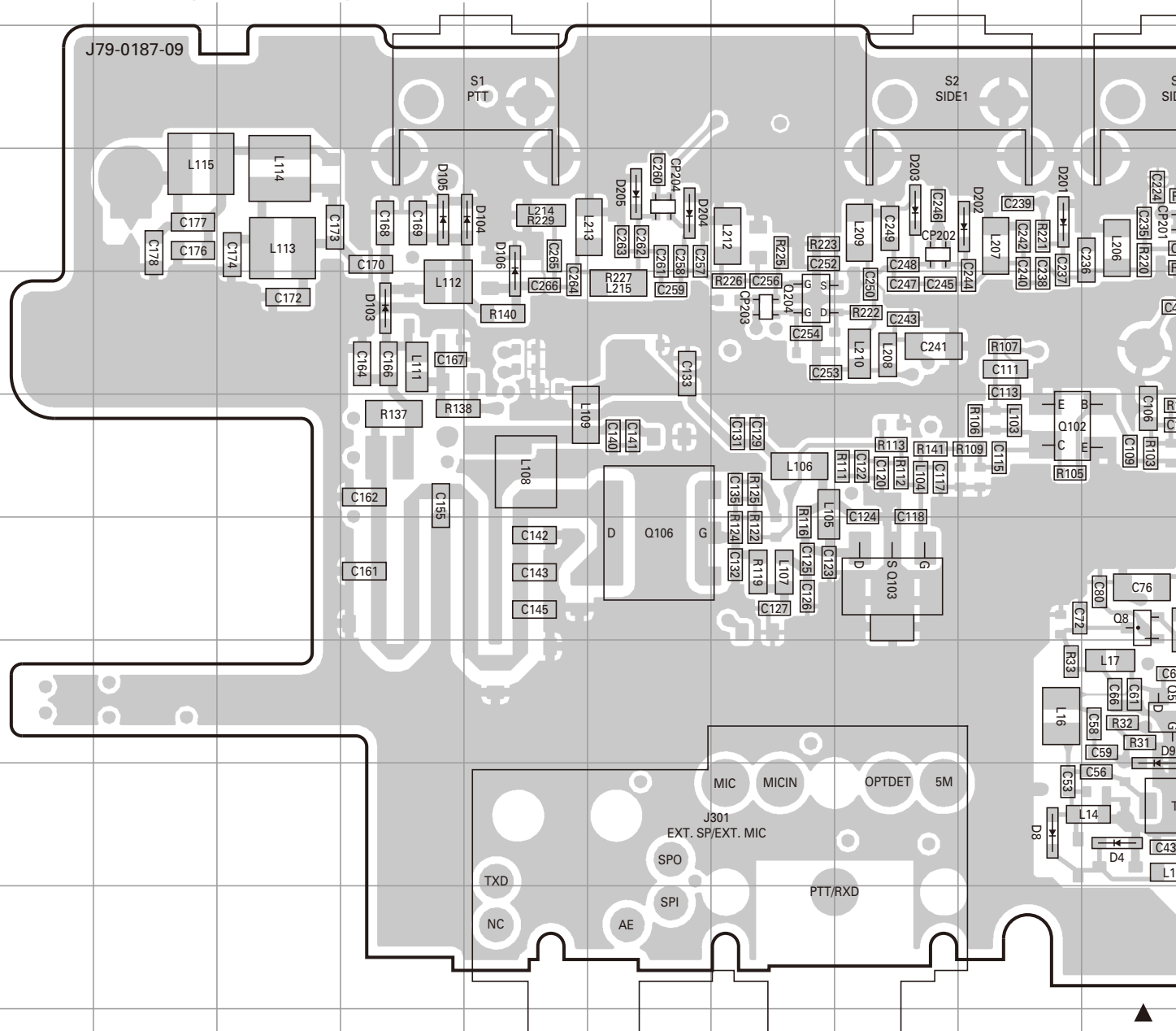
Layer 3

Layer 4

Foil side

# TK-3302 PC BOARD

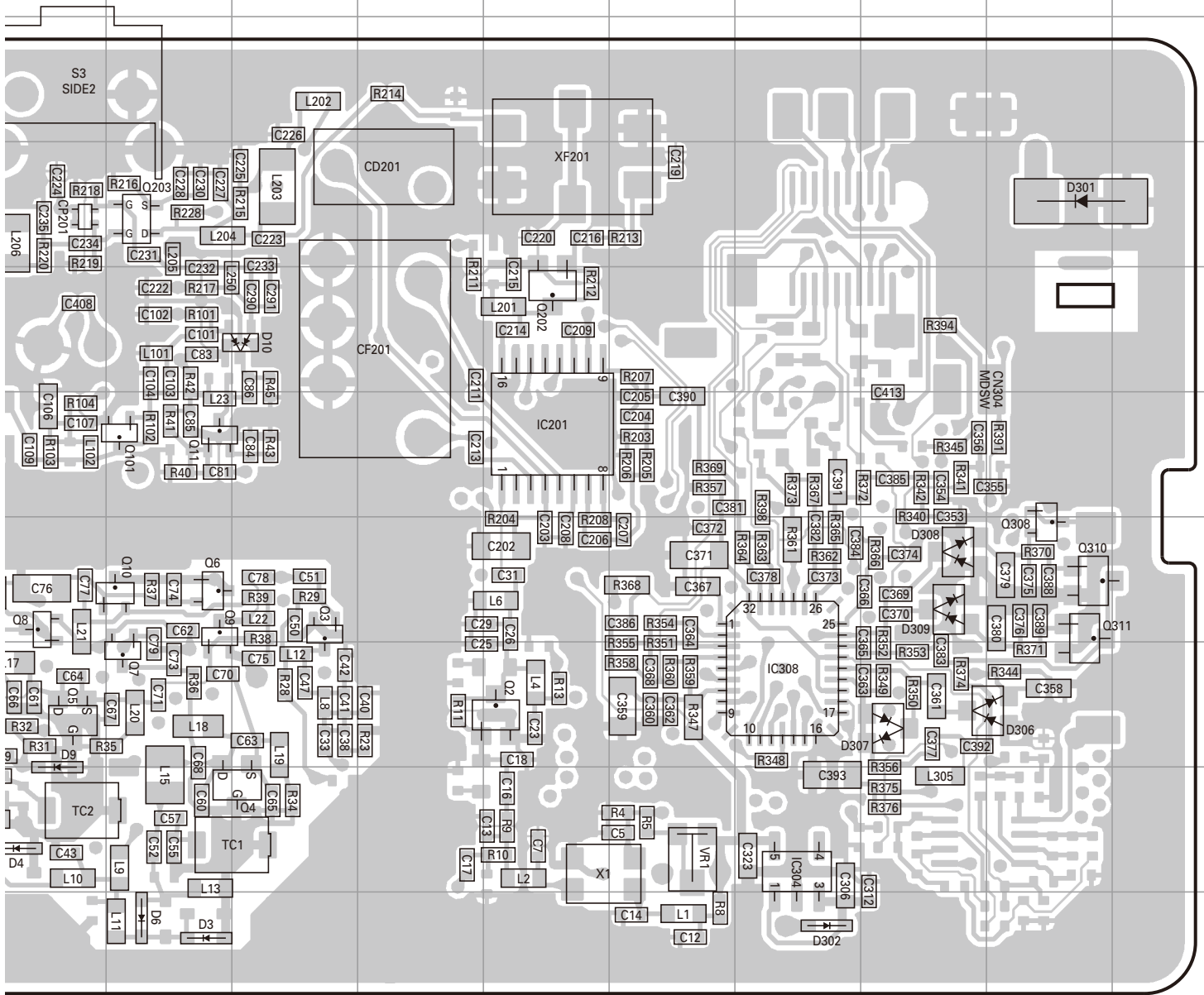
**TX-RX UNIT (X57-7580-XX) -22: K2,M2 -23: K3**  
**Foil side view (J79-0187-09)**



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC201	6N	Q8	7J	Q203	4K	D9	8J	D204	4F
IC304	9P	Q9	7K	Q204	5G	D10	5L	D205	4F
IC308	8P	Q10	7K	Q308	7R	D103	5D	D301	4R
Q2	8N	Q11	6K	Q310	7R	D104	4E	D302	10P
Q3	7L	Q101	6K	Q311	7R	D105	4D	D306	8R
Q4	9L	Q102	6I	D3	10K	D106	4E	D307	8Q
Q5	8J	Q103	7H	D4	9J	D201	4I	D308	7Q
Q6	7K	Q106	7F	D6	10K	D202	4I	D309	7Q
Q7	8K	Q202	5N	D8	9I	D203	4H		

# PC BOARD TK-3302

TX-RX UNIT (X57-7580-XX) -22: K2,M2 -23: K3  
Foil side view (J79-0187-09)



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

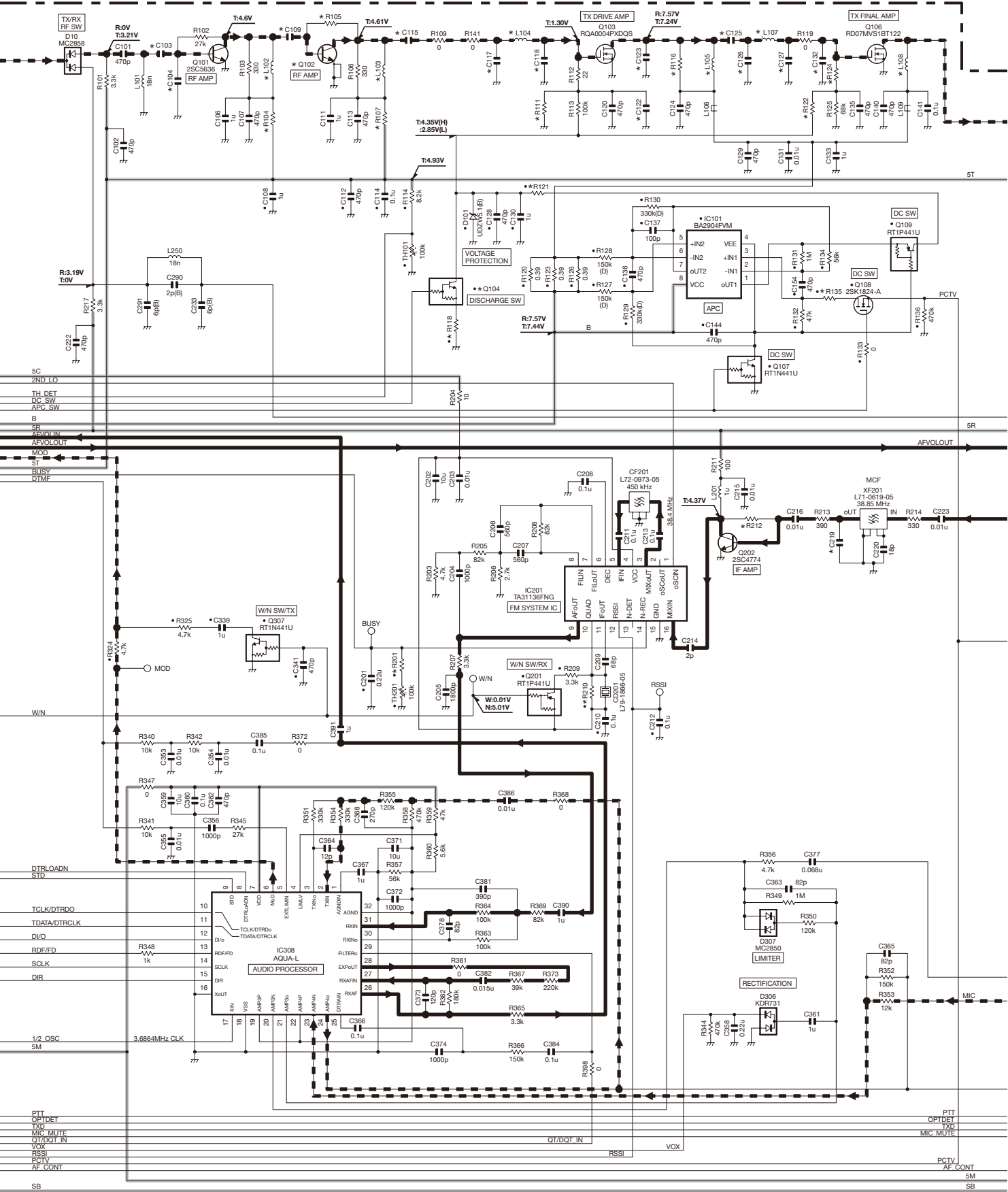
## 7



# TK-3302 SCHEMATIC DIAGRAM

X57-7580-XX	Q102	Q104	L102	L103	L104	L105	L107	L108	R104	R105	R107	R111	R116	R118	R121	R122	R124	R135	R201	R210	R212	C103	C104	C109	C115	C117	C118	C122	C123	C125	C126	C127	C132	C219		
-20	K,M,P	2SC492BYD	NO	39n	15n	8.2n	22n	2.7n	2T	47	27k	56	39k	330	NO	10k	27k	22	180k	82k	3.9k	220K	30p	4p	6p	11p	11p	NO	NO	NO	10p	11p	16p	NO	1p	
-22	K2,M2	2SC5455-A	RT1N441U	39n	22n	3.3n	22n	8.2n	3T	47	27k	56	39k	330	O	4.7k	27k	22	100k	82k	3.9k	180K	12p	NO	6p	5p	2p	NO	1u	NO	10p	6p	18p	56p	NO	1p
-23	K3	2SC5455-A	RT1N441U	27n	18n	8.2n	4.7n	2.2n	2T	39	18k	39	47k	NO	330	15k	68k	100	100k	180k	4.7k	220K	12p	16p	18p	5p	NO	9p	1u	0.5p	15p	NO	47p	NO	NO	1p

TX-RX UNIT (X57-7580-XX)

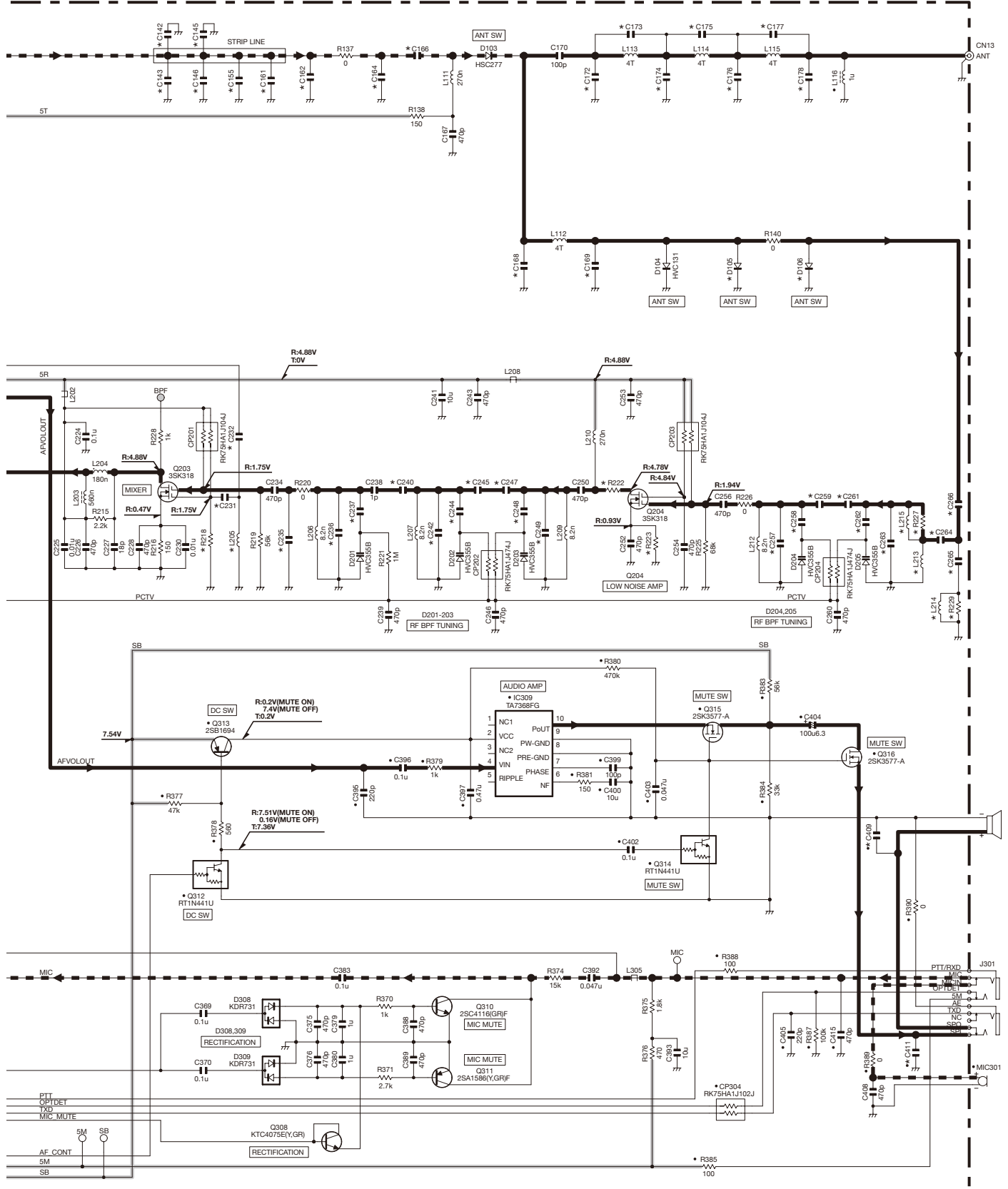


# SCHEMATIC DIAGRAM TK-3302

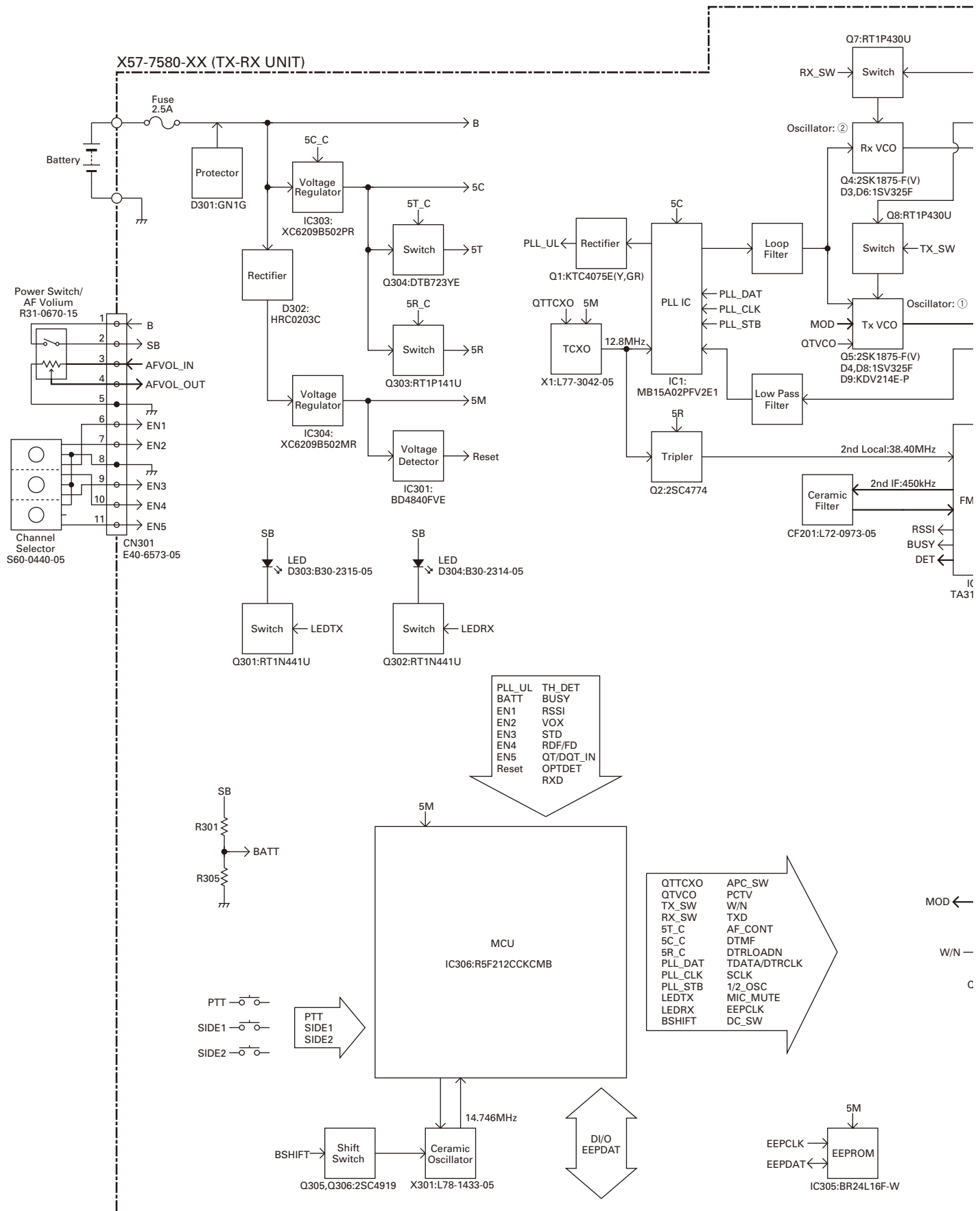
X57-7580-XX	L205	L213	L214	L215	R218	R222	R223	R227	R229	C142	C143	C145	C146	C155	C161	C162	C164	C166	C168	C169	C172	C173	C174	C175	C176	C177	C178	
-20	K,M,P	27n	8.2n	47n	NO	56k	22	220	0	NO	43p	NO	NO	12p	NO	1p	2p	NO	6p	4p	2.5p	3p	0.5p	5p	2p	5p	2p	3p
-22	K2,M2	27n	3.9n	NO	3.9n	56k	22	220	NO	0	NO	30p	1p	NO	NO	NO	1p	NO	5p	2.5p	4p	6p	NO	11p	NO	7p	0.5p	2p
-23	K3	33n	8.2n	47n	NO	82k	15	120	0	NO	47p	NO	36p	NO	0.3p	1.5p	NO	3p	7p	4p	2.5p	1p	0.5p	10p	NO	10p	0.3p	6p

X57-7580-XX	C231	C232	C235	C236	C237	C240	C242	C244	C245	C247	C248	C249	C257	C258	C259	C261	C262	C263	C264	C265	C266	C409	C411	D105	D106	
-20	K,M,P	470p	3.5p	NO	4p	22p	2p	6p	22p	1p	2p	22p	4p	3.5p	22p	2p	3p	22p	1p	3.5p	3p	470p	470p	HVC131	NO	
-22	K2,M2	470p	4p	NO	2.5p	30p	1.5p	4p	30p	0.75p	2p	30p	3p	2.5p	30p	1.5p	1.5p	30p	2p	22p	8p	6p	NO	NO	HVC131	
-23	K3	1000p	3.5p	0.75p	7p	27p	4p	8p	27p	1p	4p	27p	8p	8p	22p	1.5p	2p	22p	6p	2p	5p	7p	470p	NO	NO	HVC131

TX-RX UNIT (X57-7580-XX)

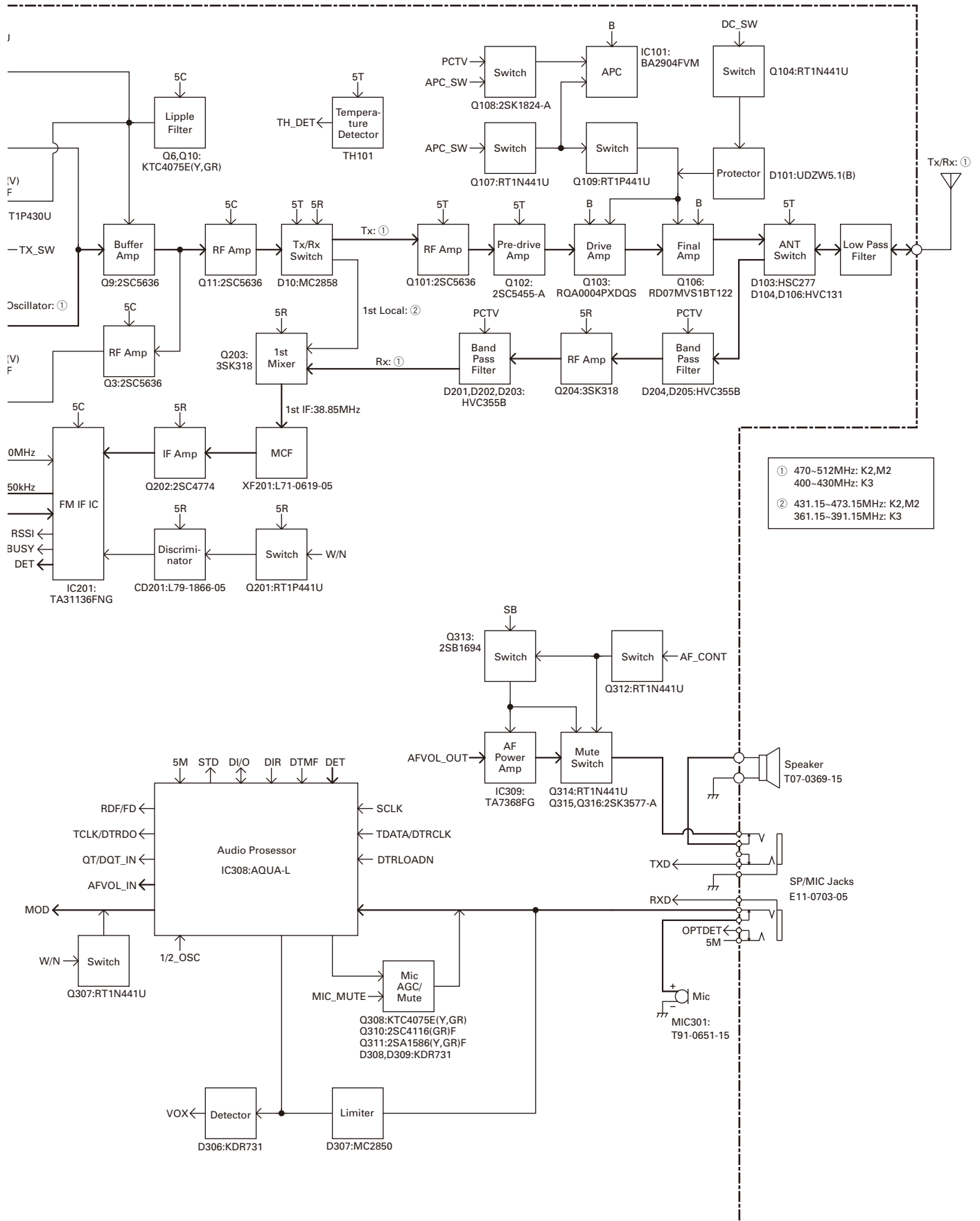


## BLOCK DIAGRAM



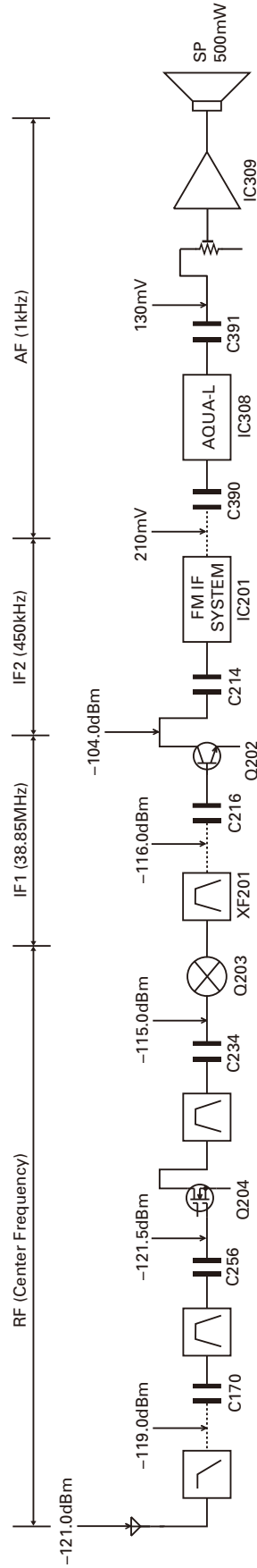


## BLOCK DIAGRAM



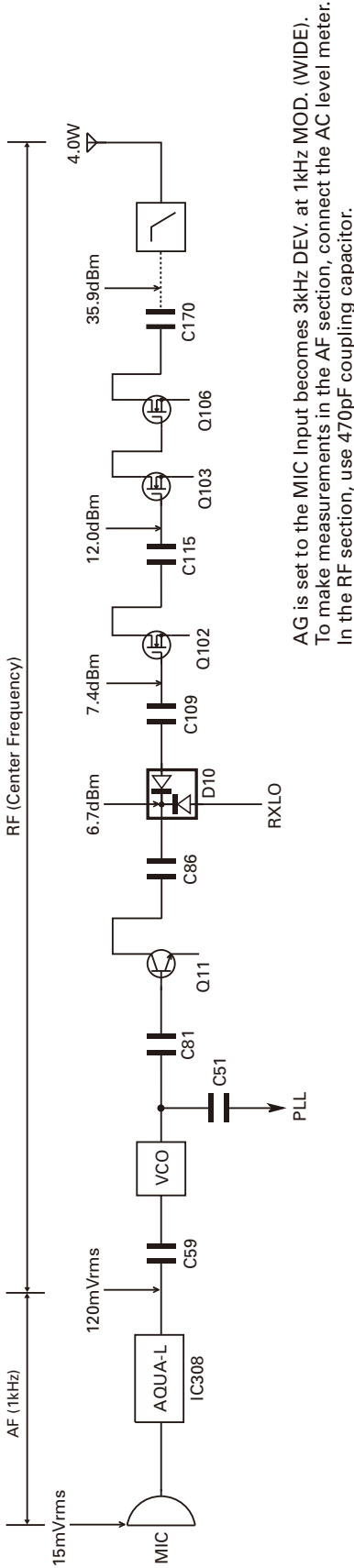
LEVEL DIAGRAM

Receiver Section



To make measurements in the AF section, connect the AC level meter.  
(ANT input: -53dBm, 1kHz FM, 3kHz DEV (WIDE).)  
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



# SPECIFICATIONS

## General

Frequency Range.....	470~512MHz (TK-3302 K2,M2) 400~430MHz (TK-3302 K3)
Number of channels .....	Max. 16
Channel Spacing .....	25kHz (Wide) / 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 (-22°F to +140°F)
Frequency Stability .....	±2.5ppm (-30°C to +60°C)
Channel Frequency Spread.....	42MHz (TK-3302 K2,M2) 30MHz (TK-3302 K3)
Dimensions and Weight (Dimensions not including protrusions)	
Radio Only .....	160g (5.6oz)
With KNB-45L (2000mAh battery) .....	54 (2.13) W x 122 (4.8) H x 33.8 (1.33) D mm (inches) 280g (9.9oz)

## Receiver (Measurements made per TIA/EIA-603)

Sensitivity	
EIA 12dB SINAD.....	0.25µV (Wide) / 0.28µV (Narrow)
Selectivity .....	70dB (Wide) / 60dB (Narrow)
Intermodulation .....	65dB (Wide) / 60dB (Narrow)
Spurious response.....	60dB
Audio Power Output.....	500mW at 4Ω less than 10% distortion

## Transmitter (Measurements made per TIA/EIA-603)

RF Power Output.....	4W/1W
Spurious and Harmonics.....	65dB
Modulation.....	16K0F3E (Wide) / 11K0F3E (Narrow)
FM Noise .....	45dB (Wide) / 40dB (Narrow)
Audio Distortion.....	Less than 5%

# TK-3302

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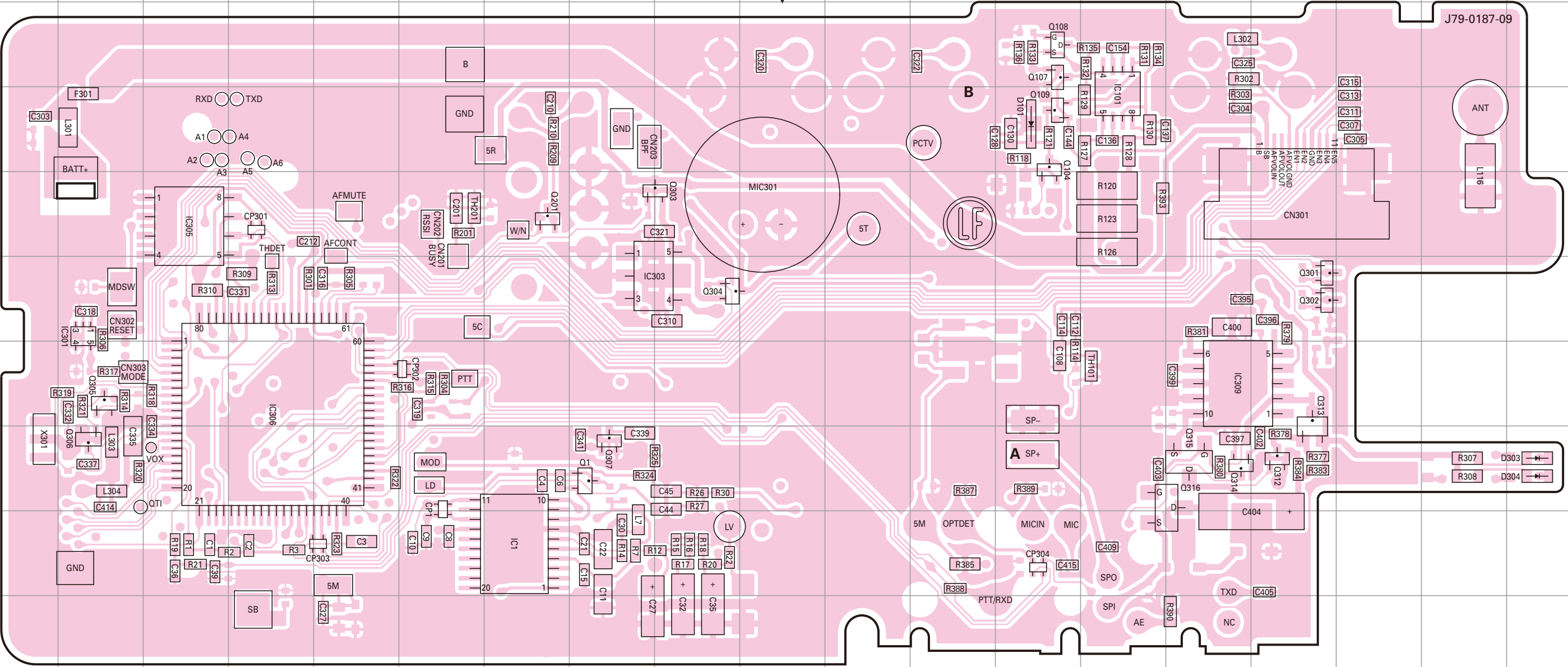


# TK-3302 PC BOARD

# PC BOARD TK-3302

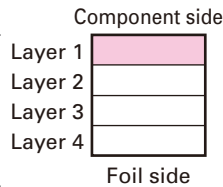
TX-RX UNIT (X57-7580-XX) -22: K2,M2 -23: K3  
Component side view (J79-0187-09)

TX-RX UNIT (X57-7580-XX) -22: K2,M2 -23: K3  
Component side view (J79-0187-09)



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

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	9G	Q104	4M	Q304	6I	Q316	8O
IC101	4N	Q107	3M	Q305	7B	D101	4M
IC301	6B	Q108	3M	Q306	8B	D303	8S
IC303	6H	Q109	4M	Q307	8H	D304	8S
IC305	5C	Q201	5G	Q312	8P		
IC306	7D	Q301	6P	Q313	7P		
IC309	7O	Q302	6P	Q314	8O		
Q1	8H	Q303	5I	Q315	8O		

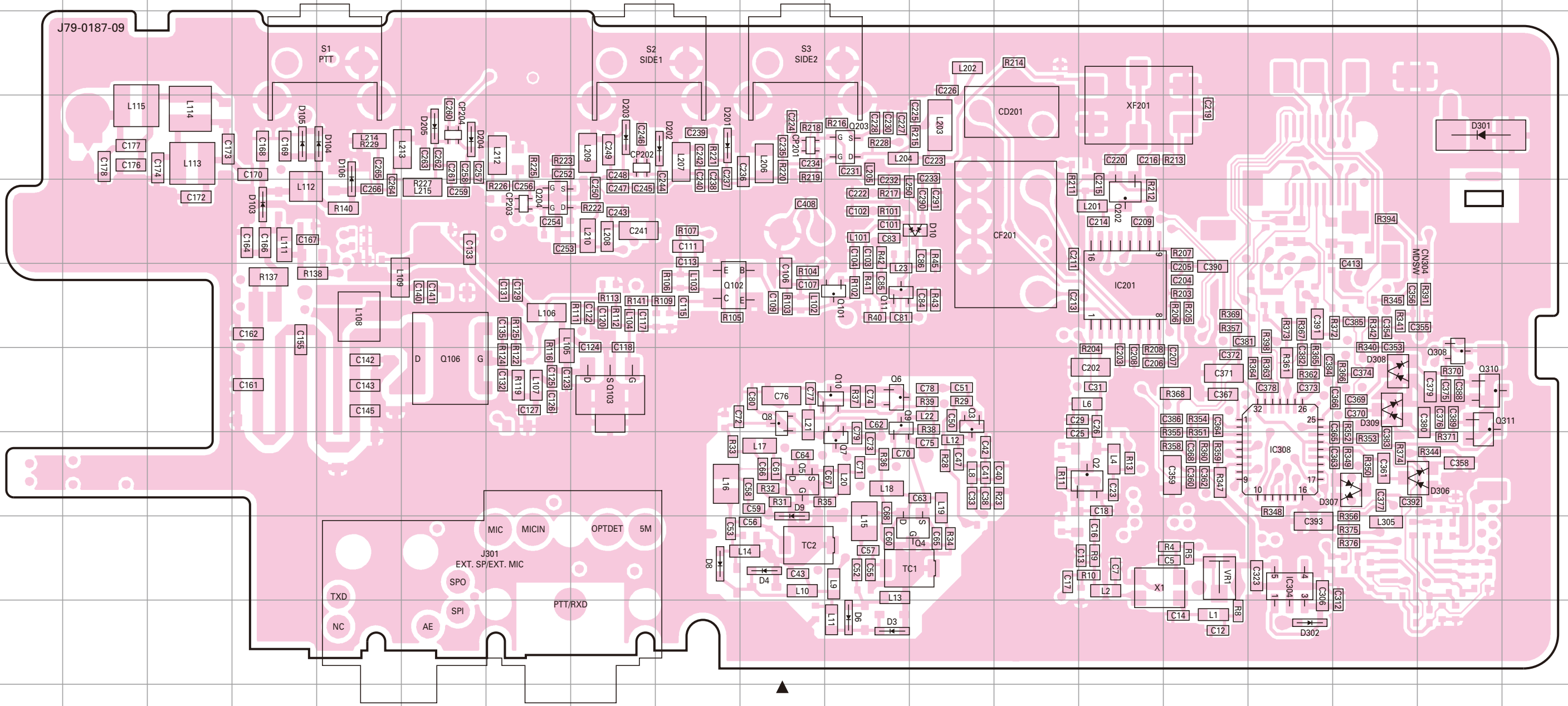


# TK-3302 PC BOARD

# PC BOARD TK-3302

TX-RX UNIT (X57-7580-XX) -22: K2,M2 -23: K3  
Foil side view (J79-0187-09)

TX-RX UNIT (X57-7580-XX) -22: K2,M2 -23: K3  
Foil side view (J79-0187-09)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC201	6N	Q8	7J	Q203	4K	D9	8J	D204	4F
IC304	9P	Q9	7K	Q204	5G	D10	5L	D205	4F
IC308	8P	Q10	7K	Q308	7R	D103	5D	D301	4R
Q2	8N	Q11	6K	Q310	7R	D104	4E	D302	10P
Q3	7L	Q101	6K	Q311	7R	D105	4D	D306	8R
Q4	9L	Q102	6I	D3	10K	D106	4E	D307	8Q
Q5	8J	Q103	7H	D4	9J	D201	4I	D308	7Q
Q6	7K	Q106	7F	D6	10K	D202	4I	D309	7Q
Q7	8K	Q202	5N	D8	9I	D203	4H		

