

Refer to the TK-3202/3206 service manuals (B51-8678-00, B51-8751-00) for any information which has not been covered in this TK-3202L service manual.



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This product uses Lead Free solder.

GENERAL / SYSTEM SET-UP

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:

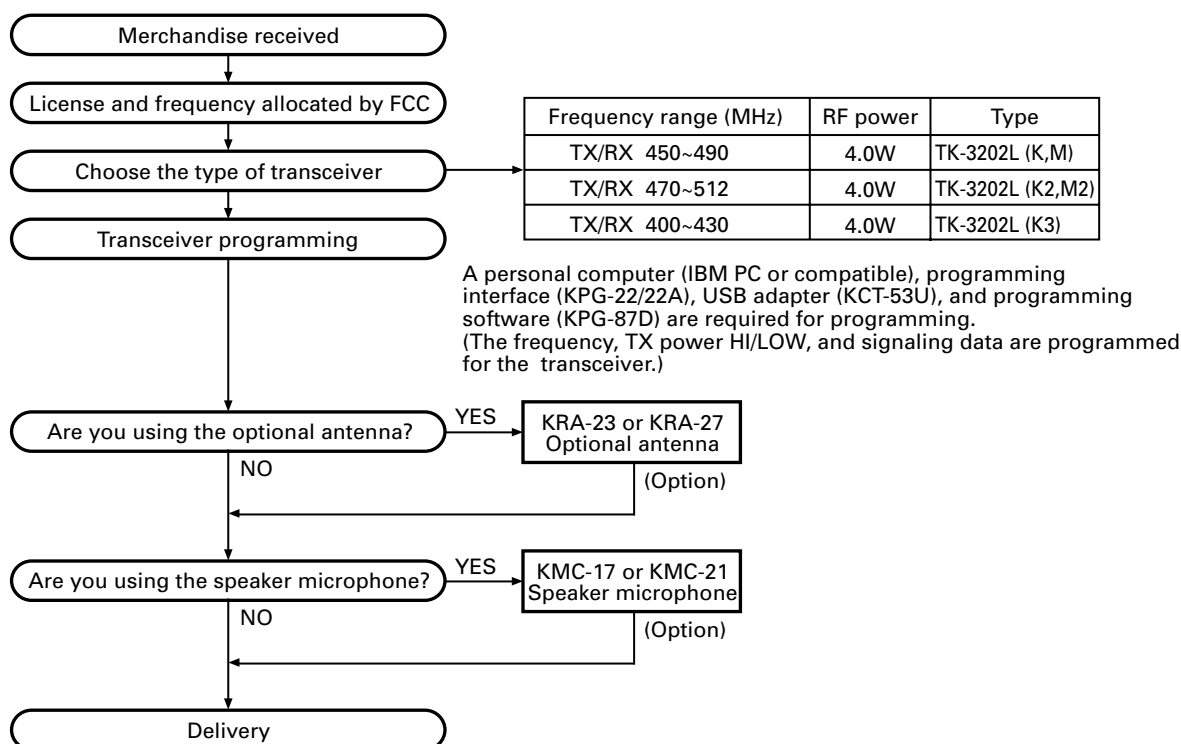
- DO NOT transmit until all RF connectors are verified secure and any open connectors are properly terminated.
- SHUT OFF and DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.
- This equipment should be serviced by a qualified technician only.

SERVICE

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

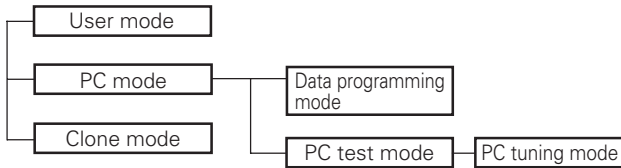
Model & destination	Unit		Frequency range	Remarks
		TX-RX Unit		
TK-3202L	K,M	X57-6890-26	450~490MHz	IF1 : 38.85MHz LOC : 38.4MHz
TK-3202L	K2,M2	X57-6890-27	470~512MHz	
TK-3202L	K3	X57-6890-28	400~430MHz	

SYSTEM SET-UP



REALIGNMENT

1. Modes



Mode	Function
User mode	For normal use.
PC mode	Used for communication between the transceiver and PC (IBM compatible).
Data programming mode	Used to read and write frequency data and other features to and from the transceiver.
PC test mode	Used to check the transceiver using the PC. This feature is included in the FPU.
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
Clone mode	[PTT]+[Side2]+Power ON (Two seconds)

3. PC Mode

3-1. Preface

The transceiver is programmed using a personal computer, a programming interface (KPG-22/22A), USB adapter (KCT-53U) and programming software (KPG-87D).

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

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 transmitting from the transceiver, the red LED lights.
When data is received by the transceiver, the green LED lights.

Notes:

- The data stored in the computer must match the model type when it is written into the EEPROM.
- Change the transceiver to PC mode, then attach the interface cable.

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. Programming software KPG-87D description

KPG-87D is the programming software for the transceiver supplied on a CD-ROM. This software runs under Windows 98, ME, Windows 2000 or XP on an IBM-PC or compatible machine.

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

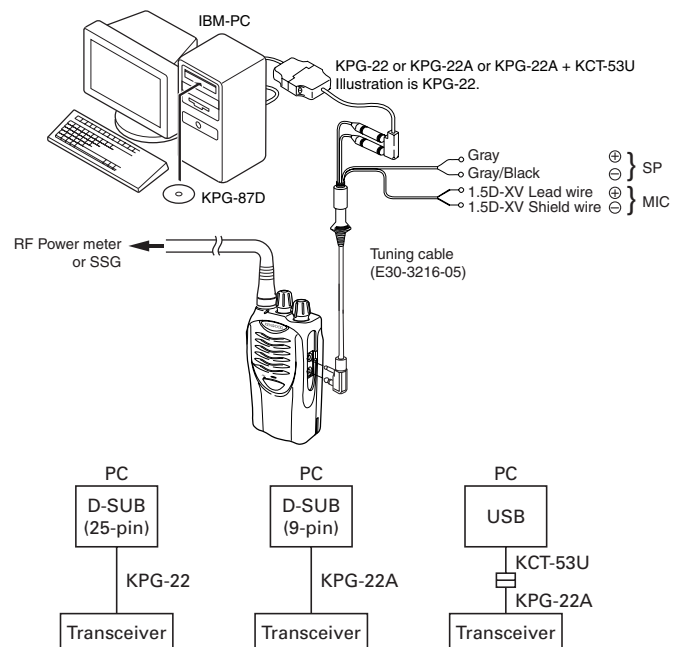


Fig. 1

REALIGNMENT

4. Clone Mode

4-1. Outline

"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 Clone mode.

4-3. Operation

1. To switch the clone target/s to 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 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 Clone Mode is configured as "Disabled", the transceiver cannot enter Clone mode.
- The table shown below will cover the frequency tables used for wireless cloning.
- 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 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.
- **Clone mode can be used ONLY by the authorized service personnel.**
- **The 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 Clone mode.**

Clone Frequency Table

Type	K,M	K2,M2	K3
Operating Frequency (MHz)	450~490	470~512	400~430
Clone Frequency Table			
1	450.000	472.000	400.000
2	452.000	474.000	401.000
3	454.000	476.000	402.000
4	456.000	478.000	403.000
5	458.000	480.000	404.000
6	460.000	482.000	405.000
7	462.000	484.000	406.000
8	464.000	486.000	407.000
9	466.000	488.000	408.000
10	468.000	490.000	409.000
11	470.000	492.000	410.000
12	472.000	494.000	411.000
13	474.000	496.000	412.000
14	476.000	498.000	413.000
15	478.000	500.000	414.000
16	480.000	502.000	415.000
17	482.000	504.000	416.000
18	484.000	506.000	417.000
19	486.000	508.000	418.000
20	488.000	510.000	419.000

CIRCUIT DESCRIPTION

1. Control Circuit

The control circuit consists of a microprocessor (IC405) and its peripheral circuits. It controls the TX-RX unit. IC405 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.

1) Frequency Shift Circuit

The microprocessor (IC405) operates at a clock of 7.3728MHz. This oscillator has a circuit that shifts the frequency by BEAT SHIFT SW (Q407, Q408).

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.

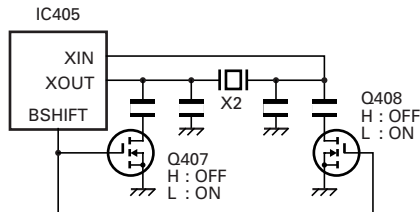


Fig. 1 Frequency shift circuit

2) Memory Circuit

Memory circuit consists of the CPU (IC405) and an EEPROM (IC406). An EEPROM has a capacity of 8k bits that contains the transceiver control program for the CPU and data such as transceiver channels and operating features.



Fig. 2 Memory circuit

3) Low Battery Warning

The battery voltage is checked using by the microprocessor. The transceiver generates a warning tone when the battery voltage falls below the warning voltage (2) 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:

During reception, transceiver constantly checks the battery level. When the battery level drops near to 5.9V, the red LED blinks and low battery warning tone is generated.

- (2) The transceiver immediately stops transmission when the battery voltage falls below the voltage (2) shown in the table. The warning tone sounds while the PTT switch is pressed.

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

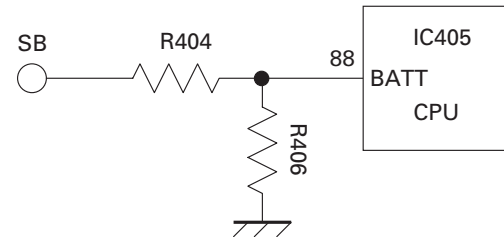


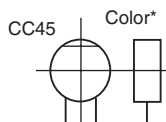
Fig. 3 Low battery warning

PARTS LIST

CAPACITORS

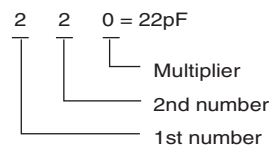
CC 45 TH 1H 220 J
1 2 3 4 5 6

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



· Capacitor value

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



· Temperature coefficient

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

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

Example : CC45TH = -470 ± 60ppm/°C

· Tolerance (More than 10pF)

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

(Less than 10pF)

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

· Voltage rating

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

· Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7 Refer to the table above.

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

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

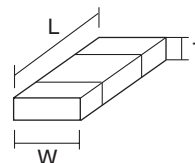
(Chip)(B,F)

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

Dimension (Chip capacitors)

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

Dimension



Dimension (Chip resistor)

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

Rating wattage

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

RESISTORS

· Chip resistor (Carbon)

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

(Chip)(B,F)

· Carbon resistor (Normal type)

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

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

PARTS LIST

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

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

TK-3202L (Y50-6180-XX)
TX-RX UNIT (X57-6890-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
TK-3202L					
1	1A	*	A02-3883-23	PLASTIC CABINET	
2	1A	*	A02-3974-03	PLASTIC CABINET ASSY(16CH)	
3	3A		A10-4078-31	CHASSIS	
4	1B		A21-1644-23	DRESSING PANEL(16CH)	
5	2C		B09-0680-03	CAP(SP/MIC) ACCESSORY	
6	2B		B11-1817-04	ILLUMINATION GUIDE	
7	1B		B43-1156-04	BADGE(KENWOOD)	
8	1A	*	B43-1199-04	BADGE(TK-3202L)	
9	1C	*	B62-1971-00	INSTRUCTION MANUAL	
11	1A		D10-0649-03	LEVER	
12	1A		D21-0863-04	SHAFT	
13	1A		D32-0441-03	STOPPER	
14	2A		E04-0465-05	RF COAXIAL RECEPTACLE(SMA)	
15	3B		E23-1253-04	TERMINAL(BATT-)	
16	2B		E37-1175-05	PROCESSED LEAD WIRE(BROWN:SP+)	
17	2B		E37-1176-05	PROCESSED LEAD WIRE(GREEN:SP-)	
18	3A		F20-3353-14	INSULATING SHEET(CHASSIS BATT+)	
19	2A		G01-4542-04	COIL SPRING(LEVER)	
20	1A		G01-4543-04	COIL SPRING(STOPPER)	
21	2B		G10-1330-04	FIBROUS SHEET(IC302:AUDIO IC)	
22	3A		G11-4283-04	RUBBER SHEET(Q103:FINAL FET)	
23	2A		G11-4313-04	SHEET(MIC ELEMENT)	
24	3B		G13-2009-04	CUSHION(CHASSIS)	
29	3B		G13-2033-04	CUSHION(TERMINAL BATT-)	
30	3A		G13-2034-14	CUSHION(TERMINAL BATT-)	
31	3A		G13-2038-24	CUSHION(CHASSIS-CERAMIC FILTER)	
32	2A		G13-2039-14	CUSHION(PCB-CERAMIC FILTER)	
33	2A		G13-2051-04	CUSHION(VCO)	
34	2B		G13-2088-04	CUSHION(CHASSIS VOL/CH)	
35	3A		G53-1604-03	PACKING(CHASSIS)	
36	3A		G53-1605-03	PACKING(TERMINAL BATT+)	
37	2B		G53-1606-13	PACKING(VOL/CH/LED)	
38	1B		G53-1607-03	PACKING(SP/MIC)	
39	2B		G53-1608-03	PACKING(SP)	
40	2A		G53-1609-14	PACKING(MIC ELEMENT)	
41	2B		G53-1610-04	PACKING(SMA)	
43	2D	*	H12-4221-05	PACKING FIXTURE	
45	1C		H25-0085-04	PROTECTION BAG (100/200/0.07)	
46	3D	*	H52-2160-02	ITEM CARTON CASE	
48	2C		J19-5472-03	HOLDER(SP/MIC) ACCESSORY	
49	2A		J19-5473-03	HOLDER ASSY(TERMINAL BATT+)	
50	2B		J21-8478-04	MOUNTING HARDWARE(SP/MIC)	
51	2B		J21-8525-03	MOUNTING HARDWARE(VOL/CH)	
52	2D	*	J29-0734-05	BELT CLIP ACCESSORY	
54	2B		J82-0092-05	FPC	
57	1A		K29-9308-23	BUTTON KNOB(PTT)	
58	1B		K29-9309-03	KNOB(VOL)	
59	1B		K29-9318-03	KNOB(CH)	
60	1A		K29-9364-03	BUTTON KNOB(SIDE1/SIDE2)	
A	2B		N14-0819-04	CIRCULAR NUT(VOL KNOB)	
B	2B		N14-0832-04	CIRCULAR NUT(CH KNOB)	
C	2A,2B		N30-2604-48	PAN HEAD MACHINE SCREW(SMA)	
D	3A		N30-2606-48	PAN HEAD MACHINE SCREW(CHASSIS)	
TX-RX UNIT (X57-6890-XX) -26 :K,M -27 :K2,M2 -28 :K3					
E	2A,28,38		N83-2005-48	PAN HEAD TAPTITE SCREW(PCB)	
61	2C		N99-2046-05	SCREW SET ACCESSORY	
62	2B		R31-0661-05	VARIABLE RESISTOR(POWER SW/VOL)	
63	2B		S60-0434-05	ROTARY SWITCH(16CH)	
64	1B		T07-0369-15	SPEAKER	
65	3C		T90-1039-15	WHIP ANTENNA ACCESSORY	K,M
65	3C		T90-1040-15	WHIP ANTENNA ACCESSORY	K2,M2
65	3C		T90-1041-15	WHIP ANTENNA ACCESSORY	K3
66	1D		W08-0988-05	CHARGER ACCESSORY	
67	1D		W08-0989-05	AC ADAPTER(AC120V) ACCESSORY	K,K2,K3
67	1D		W08-0992-05	AC ADAPTER(AC220-240V) ACCESSORY	M,M2
D403			B30-2156-05	LED(RED)	
D404			B30-2157-05	LED(YELLOW)	
C1			CK73HB1H332K	CHIP C 3300PF K	
C2			CK73HB1C682K	CHIP C 6800PF K	
C3			CK73GB1A105K	CHIP C 1.0UF K	
C4			CK73HB1C103K	CHIP C 0.010UF K	
C5			CK73HB1H102K	CHIP C 1000PF K	
C6			CK73HB1A104K	CHIP C 0.10UF K	
C7 ,8			CC73HCH1H101J	CHIP C 100PF J	
C9			CC73HCH1H100D	CHIP C 10PF D	
C10			CS77CPQJ100M	CHIP TNTL 10UF 6.3WV	
C11			CC73HCH1H101J	CHIP C 100PF J	
C12			CK73HB1H102K	CHIP C 1000PF K	
C13			CK73HB1A104K	CHIP C 0.10UF K	
C14			CK73HB1C103K	CHIP C 0.010UF K	
C15			CC73HCH1H100D	CHIP C 10PF D	
C16			CK73HB1H102K	CHIP C 1000PF K	
C17			CC73HCH1H470J	CHIP C 47PF J	
C18			CC73HCH1H180J	CHIP C 18PF J	
C19			CK73HB1A104K	CHIP C 0.10UF K	
C21			CS77CPQJ100M	CHIP TNTL 10UF 6.3WV	
C22			CS77AA1VR33M	CHIP TNTL 0.33UF 35WV	
C24			CK73HB1H102K	CHIP C 1000PF K	
C25			CC73HCH1H020B	CHIP C 2.0PF B	
C26			CC73HCH1H300J	CHIP C 30PF J	
C27			CS77CA1C3R3M	CHIP TNTL 3.3UF 16WV	
C29 ,30			CK73HB1H471K	CHIP C 470PF K	
C32			CS77CA1V0R1M	CHIP TNTL 0.1UF 35WV	
C33 ,34			CK73HB1H102K	CHIP C 1000PF K	
C35			CC73HCH1H270J	CHIP C 27PF J	
C38			CC73HCH1H050B	CHIP C 5.0PF B	
C39			CK73GB1H332K	CHIP C 3300PF K	
C40			CC73HCH1H030B	CHIP C 3.0PF B	
C41			CK73GB1H682K	CHIP C 6800PF K	
C42			CC73HCH1H050B	CHIP C 5.0PF B	
C43			CC73HCH1H100C	CHIP C 10PF C	
C44			CK73HB1H471K	CHIP C 470PF K	
C45			CK73GB1A105K	CHIP C 1.0UF K	
C47			CC73HCH1H101J	CHIP C 100PF J	
C48			CK73HB1H471K	CHIP C 470PF K	
C49			CC73HCH1H101J	CHIP C 100PF J	

PARTS LIST

TX-RX UNIT (X57-6890-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C50			CC73HCH1H100D	CHIP C 10PF D		C116			CC73GCH1H110J	CHIP C 11PF J	K,K2,M
C52			CC73HCH1H110J	CHIP C 11PF J	K,K3,M	C116			CC73GCH1H110J	CHIP C 11PF J	M2
C52			CC73HCH1H130J	CHIP C 13PF J	K2,M2	C119			CK73GB1H471K	CHIP C 470PF K	
C53			CC73HCH1H020B	CHIP C 2.0PF B	K,K2,M	C121			CC73GCH1H120J	CHIP C 12PF J	K3
C53			CC73HCH1H020B	CHIP C 2.0PF B	M2	C122			CC73GCH1H330J	CHIP C 33PF J	
C53			CC73HCH1H040B	CHIP C 4.0PF B	K3	C123			CC73GCH1H330G	CHIP C 33PF G	
						C124			CC73HCH1H100D	CHIP C 10PF D	
C54			CC73HCH1H060B	CHIP C 6.0PF B	K,M						
C54			CC73HCH1H070B	CHIP C 7.0PF B	K3	C125			CC73GCH1H060B	CHIP C 6.0PF B	K,K2,M
C54			CC73HCH1H090B	CHIP C 9.0PF B	K2,M2	C125			CC73GCH1H060B	CHIP C 6.0PF B	M2
C55			CC73HCH1H110J	CHIP C 11PF J	K,M	C125			CC73GCH1H110G	CHIP C 11PF G	K3
C55			CC73HCH1H120J	CHIP C 12PF J	K2,K3,M2	C126			CS77CA1C010M	CHIP TNTL 1.0UF 16WV	
						C127			CC73GCH1H200J	CHIP C 20PF J	K,K2,M
C56			CC73HCH1H020B	CHIP C 2.0PF B	K,M						
C56			CC73HCH1H050B	CHIP C 5.0PF B	K3	C127			CC73GCH1H200J	CHIP C 20PF J	M2
C57			CC73HCH1H0R5B	CHIP C 0.5PF B	K3	C128			CK73HB1H471K	CHIP C 470PF K	
C58			CC73HCH1H060B	CHIP C 6.0PF B	K,M	C129			CK73GB1H471K	CHIP C 470PF K	
C58			CC73HCH1H070B	CHIP C 7.0PF B	K3	C130			CK73HB1H471K	CHIP C 470PF K	
						C132			CC73GCH1H200J	CHIP C 20PF J	K,M
C58			CC73HCH1H090B	CHIP C 9.0PF B	K2,M2						
C59			CC73HCH1H1R5B	CHIP C 1.5PF B	K3	C132			CC73GCH1H270J	CHIP C 27PF J	K2,M2
C59_60			CC73HCH1H010B	CHIP C 1.0PF B	K,K2,M	C132			CC73GCH1H390J	CHIP C 39PF J	K3
C59_60			CC73HCH1H010B	CHIP C 1.0PF B	M2	C133			CK73GB1H471K	CHIP C 470PF K	
C60			CC73HCH1H010B	CHIP C 1.0PF B	K3	C134			CK73GB1H103K	CHIP C 0.010UF K	
						C135			CK73GB1C104K	CHIP C 0.10UF K	
C61			CC73HCH1H030B	CHIP C 3.0PF B	K,M						
C61			CC73HCH1H040B	CHIP C 4.0PF B	K2,K3,M2	C136			CK73GB1A105K	CHIP C 1.0UF K	
C62			CC73HCH1H020B	CHIP C 2.0PF B	K,K2,M	C138			CK73GB1H102K	CHIP C 1000PF K	
C62			CC73HCH1H020B	CHIP C 2.0PF B	M2	C140			CC73GCH1H101J	CHIP C 100PF J	
C62			CC73HCH1H030B	CHIP C 3.0PF B	K3	C145			CC73GCH1H180J	CHIP C 18PF J	K,K2,M
						C145			CC73GCH1H180J	CHIP C 18PF J	M2
C63			CC73HCH1H101J	CHIP C 100PF J							
C64			CC73HCH1H040B	CHIP C 4.0PF B	K,K3,M	C145			CC73GCH1H300J	CHIP C 30PF J	K3
C64_65			CC73HCH1H050B	CHIP C 5.0PF B	K2,M2	C146			CK73GB1H102K	CHIP C 1000PF K	
C65_66			CC73HCH1H050B	CHIP C 5.0PF B	K3	C148			CK73GB1H102K	CHIP C 1000PF K	
C65_66			CC73HCH1H060B	CHIP C 6.0PF B	K,M	C149			CC73GCH1H070B	CHIP C 7.0PF B	K,K3,M
						C151			CC73GCH1H070B	CHIP C 7.0PF B	K2,K3,M2
C66			CC73HCH1H060B	CHIP C 6.0PF B	K2,M2						
C67			CC73HCH1H040B	CHIP C 4.0PF B	K3	C152			CC73GCH1H200J	CHIP C 20PF J	
C67			CC73HCH1H050B	CHIP C 5.0PF B	K,K2,M	C154			CK73GB1H471K	CHIP C 470PF K	
C67			CC73HCH1H050B	CHIP C 5.0PF B	M2	C156			CC73GCH1H030B	CHIP C 3.0PF B	K3
C68 -70			CK73HB1H471K	CHIP C 470PF K		C156			CC73GCH1H040B	CHIP C 4.0PF B	K,M
						C156			CC73GCH1H3R5B	CHIP C 3.5PF B	K2,M2
C71_72			CK73HB1A104K	CHIP C 0.10UF K							
C73_74			CC73HCH1H0R5B	CHIP C 0.5PF B		C157			CC73GCH1H040B	CHIP C 4.0PF B	K2,K3,M2
C75_76			CK73HB1H102K	CHIP C 1000PF K		C157			CC73GCH1H2R5B	CHIP C 2.5PF B	K,M
C77			CK73HB1H471K	CHIP C 470PF K		C158			CC73GCH1H101J	CHIP C 100PF J	
C78			CC73HCH1H330J	CHIP C 33PF J		C159			CC73GCH1H020C	CHIP C 2.0PF C	K,K3,M
						C159			CC73GCH1H030B	CHIP C 3.0PF B	K2,M2
C79			CS77CP0J100M	CHIP TNTL 10UF 6.3WV							
C80			CK73HB1H471K	CHIP C 470PF K		C160			CC73GCH1H020B	CHIP C 2.0PF B	K,K3,M
C83			CC73HCH1H150J	CHIP C 15PF J		C160			CC73GCH1H1R5B	CHIP C 1.5PF B	K2,M2
C84 -86			CK73HB1H102K	CHIP C 1000PF K		C161			CC73GCH1H050B	CHIP C 5.0PF B	K,K3,M
C87			CC73HCH1H100D	CHIP C 10PF D		C161			CC73GCH1H060B	CHIP C 6.0PF B	K2,M2
						C163			CC73GCH1H030B	CHIP C 3.0PF B	
C90			CK73HB1H102K	CHIP C 1000PF K							
C100			CK73HB1H471K	CHIP C 470PF K		C164			CC73GCH1H050B	CHIP C 5.0PF B	K,K3,M
C101			CK73GB1H471K	CHIP C 470PF K		C164			CC73GCH1H060B	CHIP C 6.0PF B	K2,M2
C102			CC73GCH1H120J	CHIP C 12PF J		C166			CC73GCH1HR75B	CHIP C 0.75PF B	K,K3,M
C106			CK73HB1H471K	CHIP C 470PF K		C166			CC73GCH1H1R5B	CHIP C 1.5PF B	K2,M2
						C168			CC73GCH1H0R3B	CHIP C 0.3PF B	K2,M2
C107			CC73GCH1H060B	CHIP C 6.0PF B	K,K2,M						
C107			CC73GCH1H060B	CHIP C 6.0PF B	M2	C168			CC73GCH1H010B	CHIP C 1.0PF B	K,M
C107			CC73GCH1H070D	CHIP C 7.0PF D	K3	C169			CC73GCH1H030B	CHIP C 3.0PF B	K2,M2
C108			CK73HB1H471K	CHIP C 470PF K		C169			CC73GCH1H040B	CHIP C 4.0PF B	K,M
C110,111			CK73GB1H471K	CHIP C 470PF K		C169			CC73GCH1H100C	CHIP C 10PF C	K3
						C190			CK73GB1A105K	CHIP C 1.0UF K	
C112			CC73GCH1H070D	CHIP C 7.0PF D							
C113			CK73GB1C104K	CHIP C 0.10UF K		C191			CK73GB1H103K	CHIP C 0.010UF K	
C116			CC73GCH1H030B	CHIP C 3.0PF B	K3	C201			CK73GB1A224K	CHIP C 0.22UF 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
C206			CK73HB1H102K	CHIP C 1000PF K		C259			CK73GB1H471K	CHIP C 470PF K	
C207			CK73HB1H182K	CHIP C 1800PF K		C262,263			CK73HB1H471K	CHIP C 470PF K	
C208			CK73HB1H471K	CHIP C 470PF K		C265			CK73HB1H471K	CHIP C 470PF K	
						C266			CK73GB1H471K	CHIP C 470PF K	
C209			CS77CP0J100M	CHIP TNTL 10UF 6.3WV							
C210			CK73HB1H471K	CHIP C 470PF K		C267			CC73GCH1H050B	CHIP C 5.0PF B	K2,M2
C211			CK73HB1C103K	CHIP C 0.010UF K		C267			CC73GCH1H060B	CHIP C 6.0PF B	K3
C213			CK73HB1A104K	CHIP C 0.10UF K		C267			CC73GCH1H3R5B	CHIP C 3.5PF B	K,M
C214			CC73HCH1H680J	CHIP C 68PF J		C268			CC73GCH1H180J	CHIP C 18PF J	K2,M2
						C268			CC73GCH1H220J	CHIP C 22PF J	K,K3,M
C215			CK73HB1H102K	CHIP C 1000PF K							
C216			CK73GB1C104K	CHIP C 0.10UF K		C269			CC73GCH1H020B	CHIP C 2.0PF B	K,K3,M
C217			CK73HB1A104K	CHIP C 0.10UF K		C269			CC73GCH1H2R5B	CHIP C 2.5PF B	K2,M2
C218			CK73GB1C104K	CHIP C 0.10UF K		C270,271			CK73HB1H471K	CHIP C 470PF K	
C219			CC73HCH1H330J	CHIP C 33PF J		C272			CC73GCH1H020B	CHIP C 2.0PF B	
						C273			CC73GCH1H180J	CHIP C 18PF J	K2,M2
C220			CK73HB1H102K	CHIP C 1000PF K							
C221			CK73GB1C104K	CHIP C 0.10UF K		C273			CC73GCH1H220J	CHIP C 22PF J	K,K3,M
C222			CK73HB1H102K	CHIP C 1000PF K		C274			CC73GCH1H010B	CHIP C 1.0PF B	K,M
C224,225			CK73HB1C103K	CHIP C 0.010UF K		C274			CC73GCH1H020B	CHIP C 2.0PF B	K2,M2
C228			CC73GCH1H100C	CHIP C 10PF C		C274			CC73GCH1H040B	CHIP C 4.0PF B	K3
						C275			CC73GCH1H020B	CHIP C 2.0PF B	K,K3,M
C230			CK73HB1C103K	CHIP C 0.010UF K							
C231			CK73GB1H103K	CHIP C 0.010UF K		C275			CC73GCH1H090B	CHIP C 9.0PF B	K2,M2
C232			CK73HB1C103K	CHIP C 0.010UF K		C276			CC73GCH1H040B	CHIP C 4.0PF B	K2,K3,M2
C233			CC73GCH1H060B	CHIP C 6.0PF B		C276			CC73GCH1H3R5B	CHIP C 3.5PF B	K,M
C234			CK73HB1H102K	CHIP C 1000PF K		C290			CC73GCH1H020B	CHIP C 2.0PF B	
						C291			CC73GCH1H060B	CHIP C 6.0PF B	
C236			CC73GCH1H180J	CHIP C 18PF J							
C237			CK73HB1H102K	CHIP C 1000PF K		C292			CK73HB1H471K	CHIP C 470PF K	
C238			CK73GB1C104K	CHIP C 0.10UF K		C301			CK73HB1H392K	CHIP C 3900PF K	
C239			CK73GB1H102K	CHIP C 1000PF K		C302			CK73HB1H271K	CHIP C 270PF K	
C240			CC73GCH1H010B	CHIP C 1.0PF B	K3	C304			CK73GB1A224K	CHIP C 0.22UF K	
						C306			CS77CP0J4R7M	CHIP TNTL 4.7UF 6.3WV	
C240			CC73GCH1H3R5B	CHIP C 3.5PF B	K,K2,M						
C240			CC73GCH1H3R5B	CHIP C 3.5PF B	M2	C307,308			CK73HB1A104K	CHIP C 0.10UF K	
C241			CK73GB1H471K	CHIP C 470PF K		C309			CC73GCH1H820J	CHIP C 82PF J	
C244			CC73GCH1H030B	CHIP C 3.0PF B	K,M	C310			CK73HB1A683K	CHIP C 0.068UF K	
C244			CC73GCH1H3R5B	CHIP C 3.5PF B	K2,M2	C311			CK73GB1A105K	CHIP C 1.0UF K	
						C312			CC73GCH1H120J	CHIP C 12PF J	
C245			CC73GCH1H180J	CHIP C 18PF J	K2,M2						
C245			CC73GCH1H220J	CHIP C 22PF J	K,M	C313			CC73GCH1H121J	CHIP C 120PF J	
C246			CC73GCH1HR75B	CHIP C 0.75PF B	K2,M2	C314			CK73HB1A104K	CHIP C 0.10UF K	
C246			CC73GCH1H010B	CHIP C 1.0PF B	K,M	C315			CK73GB1A105K	CHIP C 1.0UF K	
C247			CK73HB1H471K	CHIP C 470PF K	K,K2,M	C316			CK73GB1C104K	CHIP C 0.10UF K	
						C317			CK73HB1A104K	CHIP C 0.10UF K	
C247			CK73HB1H471K	CHIP C 470PF K	M2						
C248			CC73GCH1H010B	CHIP C 1.0PF B	K2,M2	C318			CS77CP0J4R7M	CHIP TNTL 4.7UF 6.3WV	
C248			CC73GCH1H020B	CHIP C 2.0PF B	K,M	C319			CC73GCH1H271J	CHIP C 270PF J	
C249			CC73GCH1H050B	CHIP C 5.0PF B	K3	C320			CK73HB1C103K	CHIP C 0.010UF K	
C249			CC73GCH1H060B	CHIP C 6.0PF B	K,K2,M	C321			CK73GB1A105K	CHIP C 1.0UF K	
						C322			CK73HB1C153K	CHIP C 0.015UF K	
C249			CC73GCH1H060B	CHIP C 6.0PF B	M2						
C250			CC73GCH1H180J	CHIP C 18PF J	K2,M2	C323			CC73GCH1H820J	CHIP C 82PF J	
C250			CC73GCH1H220J	CHIP C 22PF J	K,K3,M	C324			CC73HCH1H820J	CHIP C 82PF J	
C251			CK73HB1H471K	CHIP C 470PF K		C325			CK73HB1A104K	CHIP C 0.10UF K	
C252			CC73GCH1HR75B	CHIP C 0.75PF B	K2,M2	C326			CK73HB1H102K	CHIP C 1000PF K	
						C327			CC73HCH1H101J	CHIP C 100PF J	
C252			CC73GCH1H1R5B	CHIP C 1.5PF B	K3						
C252,253			CC73GCH1H020B	CHIP C 2.0PF B	K,M	C328			CK73HB1H391K	CHIP C 390PF K	
C253			CC73GCH1H020B	CHIP C 2.0PF B	K2,K3,M2	C329,330			CK73GB1A105K	CHIP C 1.0UF K	
C254			CK73HB1H471K	CHIP C 470PF K		C331			CK73HB1A104K	CHIP C 0.010UF K	
C255			CC73GCH1H180J	CHIP C 18PF J	K2,M2	C332			CK73HB1H471K	CHIP C 470PF K	
						C333,334			CK73GB1C104K	CHIP C 0.10UF K	
C255			CC73GCH1H220J	CHIP C 22PF J	K,K3,M						
C256			CS77CP0J4R7M	CHIP TNTL 4.7UF 6.3WV		C335			CC73GCH1H221J	CHIP C 220PF J	
C257			CC73GCH1H060B	CHIP C 6.0PF B	K2,M2	C336			CK73FB1C474K	CHIP C 0.47UF K	
C257			CC73GCH1H070B	CHIP C 7.0PF B	K3	C338			CC73GCH1H101J	CHIP C 100PF J	
C257			CC73GCH1H4R5B	CHIP C 4.5PF B	K,M	C339			CS77AA0J100M	CHIP TNTL 10UF 6.3WV	
						C340			CK73GB1C104K	CHIP C 0.10UF K	
C258			CK73HB1H471K	CHIP C 470PF K							

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C341			CK73GB1C473K	CHIP C 0.047UF K		L10 ,11			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	
C342			CS77AA0J100M	CHIP TNTL 10UF 6.3WV		L12			L92-0138-05	CHIP FERRITE	
C343			CK73GB1C473J	CHIP C 0.047UF J		L13 ,14			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	
C344			CC73GCH1H221J	CHIP C 220PF J		L16			L40-1878-67	SMALL FIXED INDUCTOR(18NH)	K2,M2
C345			CS77CC0J101M	CHIP TNTL 100UF 6.3WV		L16			L40-2278-67	SMALL FIXED INDUCTOR(22NH)	K,M
C346			CK73GB1H102K	CHIP C 1000PF K		L16			L40-2778-67	SMALL FIXED INDUCTOR(27NH)	K3
C348			CK73HB1H471K	CHIP C 470PF K		L17			L40-2278-67	SMALL FIXED INDUCTOR(22NH)	K2,M2
C349			CK73HB1A333K	CHIP C 0.033UF K		L17			L40-2778-67	SMALL FIXED INDUCTOR(27NH)	K,M
C351,352			CK73HB1C103K	CHIP C 0.010UF K	K3	L17			L40-3378-67	SMALL FIXED INDUCTOR(33NH)	K3
C354			CK73HB1A104K	CHIP C 0.10UF K		L18 ,19			L41-2285-03	SMALL FIXED INDUCTOR(220NH)	
C401			CC73GCH1H471J	CHIP C 470PF J		L20 ,21			L40-3391-86	SMALL FIXED INDUCTOR(3.3UH)	
C402			CK73HB1H102K	CHIP C 1000PF K		L22			L92-0138-05	CHIP FERRITE	
C403			CK73GB1C104K	CHIP C 0.10UF K		L23			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	
C405			CC73GCH1H101J	CHIP C 100PF J		L24			L92-0470-05	CHIP FERRITE	
C406			CC73HCH1H101J	CHIP C 100PF J		L25			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	
C407			CK73HB1H102K	CHIP C 1000PF K		L100			L40-3375-92	SMALL FIXED INDUCTOR(33NH)	K3
C408			CC73HCH1H101J	CHIP C 100PF J		L100,101			L40-1575-92	SMALL FIXED INDUCTOR(15NH)	K,K2,M
C409,410			CK73GB1A105K	CHIP C 1.0UF K		L100,101			L40-1575-92	SMALL FIXED INDUCTOR(15NH)	M2
C411			CK73HB1H102K	CHIP C 1000PF K		L101			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	K3
C412-414			CC73HCH1H101J	CHIP C 100PF J		L102			L92-0138-05	CHIP FERRITE	
C415			CK73HB1H471K	CHIP C 470PF K		L103,104			L40-8265-92	SMALL FIXED INDUCTOR(8.2NH)	
C417			CK73GB1A105K	CHIP C 1.0UF K		L105			L40-1575-54	SMALL FIXED INDUCTOR(15NH)	K,K3,M
C418			CK73HB1E562K	CHIP C 5600PF K		L105			L40-2275-54	SMALL FIXED INDUCTOR(22NH)	K2,M2
C419			CK73HB1H102K	CHIP C 1000PF K		L106			L92-0149-05	CHIP FERRITE	
C420			CC73HCH1H101J	CHIP C 100PF J		L107			L40-1263-92	SMALL FIXED INDUCTOR(1.2NH)	K,K2,M
C421			CK73GB1A105K	CHIP C 1.0UF K		L107			L40-1263-92	SMALL FIXED INDUCTOR(1.2NH)	M2
C422			CC73HCH1H101J	CHIP C 100PF J		L109			L92-0149-05	CHIP FERRITE	
C424			CC73HCH1H101J	CHIP C 100PF J		L110			L40-2285-54	SMALL FIXED INDUCTOR(220NH)	
C426,427			CK73GB1A105K	CHIP C 1.0UF K		L111			L41-1092-44	SMALL FIXED INDUCTOR(1UH)	
C428,429			CK73HB1H102K	CHIP C 1000PF K		L201			L40-1091-37	SMALL FIXED INDUCTOR(1.000UH)	
C430			CK73GB1H103K	CHIP C 0.010UF K		L202			L92-0138-05	CHIP FERRITE	
C431			CK73HB1C103K	CHIP C 0.010UF K		L203			L41-5685-39	SMALL FIXED INDUCTOR(0.56UH)	
C432			CC73HCH1H050B	CHIP C 5.0PF B		L204			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	
C433,434			CC73HCH1H030B	CHIP C 3.0PF B		L206			L40-2775-92	SMALL FIXED INDUCTOR(27NH)	K2,M2
C435			CC73HCH1H050B	CHIP C 5.0PF B		L206			L40-3975-92	SMALL FIXED INDUCTOR(39NH)	K3
C440			CC73GCH1H1R5B	CHIP C 1.5PF B		L211,212			L41-8268-14	SMALL FIXED INDUCTOR(8.2NH)	K,K2,M
C443			CK73GB1A474K	CHIP C 0.47UF K		L211,212			L41-8268-14	SMALL FIXED INDUCTOR(8.2NH)	M2
C444			CC73GCH1H020B	CHIP C 2.0PF B	K3	L212			L41-8268-14	SMALL FIXED INDUCTOR(8.2NH)	K3
C445			CC73GCH1H200J	CHIP C 20PF J	K2,M2	L214			L41-6868-14	SMALL FIXED INDUCTOR(6.8NH)	K2,M2
C453,454			CC73HCH1H101J	CHIP C 100PF J		L214			L41-8268-14	SMALL FIXED INDUCTOR(8.2NH)	K,K3,M
C901,902			CK73GB1A105K	CHIP C 1.0UF K		L215			L41-2285-03	SMALL FIXED INDUCTOR(220NH)	
TC1 ,2			C05-0384-05	CERAMIC TRIMMER CAPACITOR(10PF)		L220			L34-4602-05	AIR-CORE COIL	
CN201			E23-1278-05	TERMINAL		L223			L34-4572-05	AIR-CORE COIL	K,K2,M
CN401			E40-6573-05	FLAT CABLE CONNECTOR		L223			L34-4572-05	AIR-CORE COIL	M2
J301			E11-0707-05	PHONE JACK(2.5/3.5)		L224-226			L34-4564-05	AIR-CORE COIL	
F401			F53-0324-05	FUSE(2.5A)		L228			L41-6868-14	SMALL FIXED INDUCTOR(6.8NH)	K2,M2
101	2A		J30-1282-14	SPACER(MIC ELEMENT)		L228,229			L41-8268-14	SMALL FIXED INDUCTOR(8.2NH)	K,K3,M
CD201			L79-1582-05	TUNING COIL		L229			L41-8268-14	SMALL FIXED INDUCTOR(8.2NH)	K2,M2
CF201	2A		L72-0973-05	CERAMIC FILTER		L230			L41-4778-03	SMALL FIXED INDUCTOR(47NH)	K,K2,M
L1			L40-4791-37	SMALL FIXED INDUCTOR(4.700UH)		L230			L41-4778-03	SMALL FIXED INDUCTOR(47NH)	M2
L3			L40-5681-86	SMALL FIXED INDUCTOR(0.56UH)		L230			L41-5678-03	SMALL FIXED INDUCTOR(56NH)	K3
L5			L40-5681-86	SMALL FIXED INDUCTOR(0.56UH)		L250			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	
L6 ,7			L92-0138-05	CHIP FERRITE		L290			L41-3078-17	SMALL FIXED INDUCTOR(30NH)	K,M
L8 ,9			L40-1875-92	SMALL FIXED INDUCTOR(18NH)		L301			L92-0140-05	CHIP FERRITE	
						L302			L92-0149-05	CHIP FERRITE	
						L401			L92-0149-05	CHIP FERRITE	
						L402-404			L92-0138-05	CHIP FERRITE	
						L410			L92-0138-05	CHIP FERRITE	
						L411			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	
						L412			L34-4564-05	AIR-CORE COIL	K3

PARTS LIST

TX-RX UNIT (X57-6890-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
X1			L77-1931-05	TCXO(12.8MHZ)		R111,112			RK73GB2A000JX	CHIP R 0.0 J 1/10W	
X2			L78-1414-05	RESONATOR(7.37MHZ)		R114			RK73GB2A124J	CHIP R 120K J 1/10W	K2,M2
XF201			L71-0619-05	MCF(38.85MHZ)		R114			RK73GB2A473J	CHIP R 47K J 1/10W	K,M
CP404			RK75HA1J473J	CHIP-COM 47K J 1/16W		R114			RK73GB2A683J	CHIP R 68K J 1/10W	K3
CP405			RK75HA1J102J	CHIP-COM 1.0K J 1/16W		R115			RK73GB2A103J	CHIP R 10K J 1/10W	
R1			RK73HB1J104J	CHIP R 100K J 1/16W	K2,M2	R116			RK73GB2A220J	CHIP R 22 J 1/10W	
R1			RK73HB1J223J	CHIP R 22K J 1/16W	K,K3,M	R120			RK73GB2A000JX	CHIP R 0.0 J 1/10W	K3
R2			RK73HB1J103J	CHIP R 10K J 1/16W		R121			RK73GB2A220J	CHIP R 22 J 1/10W	
R3			RK73HB1J333J	CHIP R 33K J 1/16W		R123			RK73FB2B000JX	CHIP R 0.0 J 1/8W	
R4			RK73HB1J563J	CHIP R 56K J 1/16W		R124			RK73GB2A473J	CHIP R 47K J 1/10W	
R5			RK73HB1J104J	CHIP R 100K J 1/16W		R126			RK73GB2A222J	CHIP R 2.2K J 1/10W	
R6			RK73HB1J823J	CHIP R 82K J 1/16W		R127-129			RK73EB2ER39K	CHIP R 0.39 K 1/4W	
R7			RK73HB1J101J	CHIP R 100 J 1/16W		R130-135			RK73GH2A154D	CHIP R 150K D 1/10W	
R8 -11			RK73HB1J000J	CHIP R 0.0 J 1/16W		R137			RK73FB2B000JX	CHIP R 0.0 J 1/8W	
R12			RK73HB1J222J	CHIP R 2.2K J 1/16W		R138			RK73GB2A105J	CHIP R 1.0M J 1/10W	
R13			RK73GB2A000JX	CHIP R 0.0 J 1/10W		R139			RK73GB2A473J	CHIP R 47K J 1/10W	
R14			RK73HB1J334J	CHIP R 330K J 1/16W		R140			RK73GB2A563J	CHIP R 56K J 1/10W	
R15			RK73GB2A221J	CHIP R 220 J 1/10W		R141			RK73GB2A104J	CHIP R 100K J 1/10W	
R16			RK73GB2A561J	CHIP R 560 J 1/10W		R142			RK73GB2A000JX	CHIP R 0.0 J 1/10W	
R17			RK73HB1J101J	CHIP R 100 J 1/16W		R143			RK73GB2A104J	CHIP R 100K J 1/10W	
R18			RK73GB2A181J	CHIP R 180 J 1/10W		R145			RK73GB2A000JX	CHIP R 0.0 J 1/10W	
R19			RK73GB2A122J	CHIP R 1.2K J 1/10W		R147			RK73GB2A000JX	CHIP R 0.0 J 1/10W	
R20			RK73HB1J100J	CHIP R 10 J 1/16W		R190			RK73GB2A101J	CHIP R 100 J 1/10W	
R21			RK73GB2A681J	CHIP R 680 J 1/10W		R191,192			RK73GB2A271J	CHIP R 270 J 1/10W	
R22			RK73GB2A000JX	CHIP R 0.0 J 1/10W		R193			RK73GB2A473J	CHIP R 47K J 1/10W	K3
R23			RK73GB2A103J	CHIP R 10K J 1/10W		R193,194			RK73GB2A473J	CHIP R 47K J 1/10W	K,K2,M
R25			RK73HB1J223J	CHIP R 22K J 1/16W		R193,194			RK73GB2A473J	CHIP R 47K J 1/10W	M2
R26			RK73HB1J103J	CHIP R 10K J 1/16W		R194			RK73GB2A683J	CHIP R 68K J 1/10W	K3
R27			RK73HB1J220J	CHIP R 22 J 1/16W		R203			RK73HB1J184J	CHIP R 180K J 1/16W	
R30			RK73HB1J333J	CHIP R 33K J 1/16W		R206			RK73GB2A100J	CHIP R 10 J 1/10W	
R31			RK73HB1J474J	CHIP R 470K J 1/16W		R207			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R32			RK73HB1J102J	CHIP R 1.0K J 1/16W		R208			RK73HB1J823J	CHIP R 82K J 1/16W	
R33			RK73HB1J154J	CHIP R 150K J 1/16W		R209			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R34			RK73HB1J474J	CHIP R 470K J 1/16W		R210,211			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R35 ,36			RK73HB1J274J	CHIP R 270K J 1/16W		R212			RK73HB1J823J	CHIP R 82K J 1/16W	
R37			RK73HB1J101J	CHIP R 100 J 1/16W		R213			RK73HB1J392J	CHIP R 3.9K J 1/16W	
R38			RK73HB1J181J	CHIP R 180 J 1/16W	K,K3,M	R215			RK73HB1J101J	CHIP R 100 J 1/16W	
R38 ,39			RK73HB1J181J	CHIP R 180 J 1/16W	K2,M2	R216			RK73HB1J124J	CHIP R 120K J 1/16W	
R39			RK73HB1J151J	CHIP R 150 J 1/16W	K,K3,M	R217			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R40			RK73HB1J101J	CHIP R 100 J 1/16W		R218			RK73HB1J561J	CHIP R 560 J 1/16W	
R41			RK73HB1J154J	CHIP R 150K J 1/16W		R219			RK73GB2A561J	CHIP R 560 J 1/10W	
R42			RK73HB1J472J	CHIP R 4.7K J 1/16W		R226,227			RK73GB2A102J	CHIP R 1.0K J 1/10W	
R43			RK73HB1J101J	CHIP R 100 J 1/16W		R228			RK73GB2A151J	CHIP R 150 J 1/10W	
R46			RK73HB1J103J	CHIP R 10K J 1/16W		R233			RK73HB1J104J	CHIP R 100K J 1/16W	
R47			RK73HB1J220J	CHIP R 22 J 1/16W		R236			RK73HB1J563J	CHIP R 56K J 1/16W	
R48			RK73HB1J331J	CHIP R 330 J 1/16W		R238			RK73HB1J104J	CHIP R 100K J 1/16W	
R49			RK73HB1J222J	CHIP R 2.2K J 1/16W		R239			RK73HB1J563J	CHIP R 56K J 1/16W	
R50			RK73HB1J472J	CHIP R 4.7K J 1/16W		R240			RK73GB2A000JX	CHIP R 0.0 J 1/10W	
R100			RK73HB1J472J	CHIP R 4.7K J 1/16W		R241			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R103			RK73GB2A333J	CHIP R 33K J 1/10W	K3	R241			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R103			RK73GB2A473J	CHIP R 47K J 1/10W	K,K2,M	R243,244			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R103			RK73GB2A473J	CHIP R 47K J 1/10W	M2	R248			RK73GB2A221J	CHIP R 220 J 1/10W	
R105			RK73GB2A331J	CHIP R 330 J 1/10W		R249			RK73GB2A220J	CHIP R 22 J 1/10W	
R106			RK73GB2A121J	CHIP R 120 J 1/10W	K3	R251			RK73HB1J104J	CHIP R 100K J 1/16W	
R106			RK73GB2A220J	CHIP R 22 J 1/10W	K,K2,M	R253			RK73HB1J104J	CHIP R 100K J 1/16W	
R106			RK73GB2A220J	CHIP R 22 J 1/10W		R254			RK73HB1J683J	CHIP R 68K J 1/16W	
R106			RK73GB2A220J	CHIP R 22 J 1/10W	M2	R255			RK73GB2A000JX	CHIP R 0.0 J 1/10W	
R107			RK73HB1J101J	CHIP R 100 J 1/16W		R256,257			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R110			RK73GB2A331J	CHIP R 330 J 1/10W		R258			RK73FB2B000JX	CHIP R 0.0 J 1/8W	

PARTS LIST

TX-RX UNIT (X57-6890-XX)

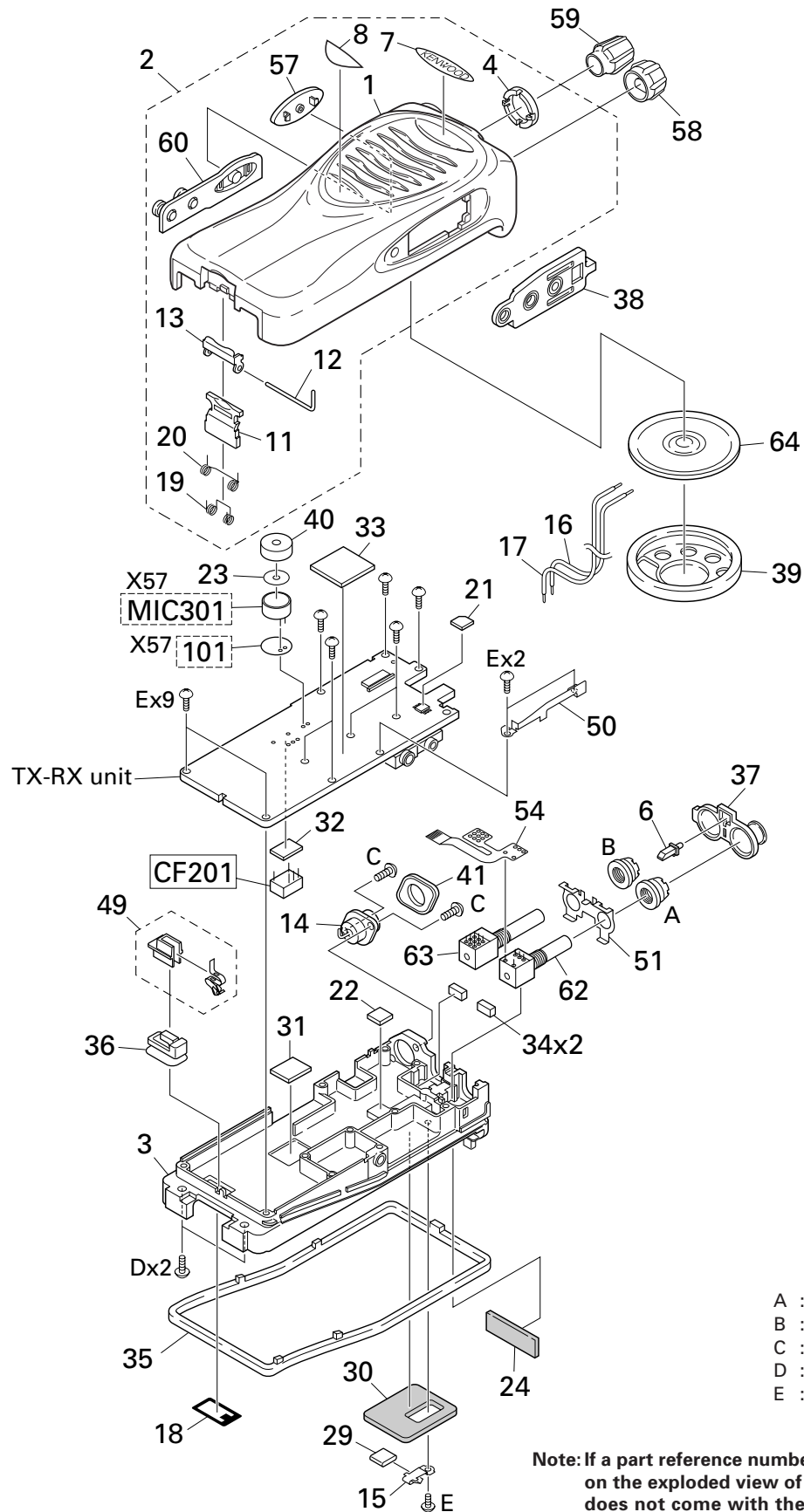
Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R301			RK73HB1J103J	CHIP R 10K J 1/16W		R424,425			RK73HB1J473J	CHIP R 47K J 1/16W	
R304			RK73HB1J273J	CHIP R 27K J 1/16W		R426			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R305			RK73HB1J104J	CHIP R 100K J 1/16W		R435			RK73HB1J473J	CHIP R 47K J 1/16W	
						R436			RK73GB2A000JX	CHIP R 0.0 J 1/10W	
R306			RK73HB1J102J	CHIP R 1.0K J 1/16W		R437,438			RK73HB1J473J	CHIP R 47K J 1/16W	
R307,308			RK73HB1J000J	CHIP R 0.0 J 1/16W		R445,446			RK73GB2A000JX	CHIP R 0.0 J 1/10W	
R310			RK73GB2A394J	CHIP R 390K J 1/10W		R447			RK73HB1J123J	CHIP R 12K J 1/16W	
R311			RK73HB1J123J	CHIP R 12K J 1/16W		R449,450			RK73GB2A000JX	CHIP R 0.0 J 1/10W	K3
R312			RK73GB2A334J	CHIP R 330K J 1/10W		R452			RK73HB1J103J	CHIP R 10K J 1/16W	
R313			RK73GB2A104J	CHIP R 100K J 1/10W		R453			RK73HB1J223J	CHIP R 22K J 1/16W	
R314			RK73GB2A103J	CHIP R 10K J 1/10W		R454			RK73GB2A000JX	CHIP R 0.0 J 1/10W	K2,M2
R315			RK73GB2A334J	CHIP R 330K J 1/10W		R901,902			RK73GB2A472J	CHIP R 4.7K J 1/10W	
R316			RK73GB2A124J	CHIP R 120K J 1/10W							
R317			RK73GB2A474J	CHIP R 470K J 1/10W		VR1			R32-0736-05	SEMI FIXED VARIABLE RESISTOR(68K)	
R318			RK73GB2A122J	CHIP R 1.2K J 1/10W		S1 -3			S70-0414-05	TACT SWITCH	
R319			RK73HB1J563J	CHIP R 56K J 1/16W		MIC301	2A		T91-0649-15	MIC ELEMENT	
R320			RK73HB1J332J	CHIP R 3.3K J 1/16W		D1			MA2S111-F	DIODE	
R321			RK73HB1J224J	CHIP R 220K J 1/16W		D2 -9			HVC376B	VARIABLE CAPACITANCE DIODE	
R322			RK73HB1J184J	CHIP R 180K J 1/16W		D10			1SV278F	VARIABLE CAPACITANCE DIODE	
R323			RK73HB1J563J	CHIP R 56K J 1/16W		D11			MA2S111-F	DIODE	
R324,325			RK73GB2A104J	CHIP R 100K J 1/10W		D101			HSC277	DIODE	
R326			RK73GB2A000JX	CHIP R 0.0 J 1/10W		D102			HZU5CCLL	ZENER DIODE	
R327			RK73GB2A184J	CHIP R 180K J 1/10W		D103,104			HVC131	DIODE	
R328			RK73GB2A103J	CHIP R 10K J 1/10W		D106			HVC131	DIODE	
R329			RK73GB2A823J	CHIP R 82K J 1/10W		D122			HVC131	DIODE	
R330			RK73HB1J332J	CHIP R 3.3K J 1/16W		D202			HSC277	DIODE	
R331			RK73GB2A154J	CHIP R 150K J 1/10W		D203-206			HVC355B	VARIABLE CAPACITANCE DIODE	
R332			RK73GB2A153J	CHIP R 15K J 1/10W		D210			HVC355B	VARIABLE CAPACITANCE DIODE	
R334			RK73GB2A473J	CHIP R 47K J 1/10W		D210			HVC355B	VARIABLE CAPACITANCE DIODE	
R335			RK73GB2A222J	CHIP R 2.2K J 1/10W		D301,302			RB706F-40	DIODE	
R336			RK73GB2A102J	CHIP R 1.0K J 1/10W		D303			DAN222	DIODE	
R337			RK73GB2A151J	CHIP R 150 J 1/10W		D401			RB521S-30	DIODE	
R338			RK73GB2A222J	CHIP R 2.2K J 1/10W		D402			1SR154-400	DIODE	
R339			RK73GB2A471J	CHIP R 470 J 1/10W		IC1			MB15A02PFV2E1	MOS-IC	
R340			RK73GB2A182J	CHIP R 1.8K J 1/10W		IC101			TA75W01FUF	MOS-IC	
R341			RK73GB2A103J	CHIP R 10K J 1/10W		IC201			TA31136FNG	MOS-IC	
R342			RK73GB2A101J	CHIP R 100 J 1/10W		IC301			AQUA-L	MOS-IC	
R343			RK73GB2A474J	CHIP R 470K J 1/10W		IC302			TA7368FG	MOS-IC	
R344			RK73GB2A102J	CHIP R 1.0K J 1/10W		IC401,402			XC6204B502MR	MOS-IC	
R345,346			RK73GB2A101J	CHIP R 100 J 1/10W		IC403			BD4840FVE	MOS-IC	
R347			RK73GB2A104J	CHIP R 100K J 1/10W		IC404			BD4845FVE	MOS-IC	
R348			RK73GB2A563J	CHIP R 56K J 1/10W		IC405		*	30622MCAC02GU	MICROCONTROLLER IC	
R349			RK73GB2A333J	CHIP R 33K J 1/10W		IC406			BR24L08F-W	ROM IC	
R350			RK73HB1J000J	CHIP R 0.0 J 1/16W	K,K2,M	Q1			KTC4082	TRANSISTOR	
R350			RK73HB1J103J	CHIP R 10K J 1/16W	M2	Q2			2SC5108(Y)F	TRANSISTOR	
R354,355			RK73HB1J103J	CHIP R 10K J 1/16W	K3	Q3 ,4			2SK508NV(K52)	FET	
R357			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q5			DTA143TE	DIGITAL TRANSISTOR	
R360			RK73HB1J000J	CHIP R 0.0 J 1/16W		Q6			2SC5108(Y)F	TRANSISTOR	
R403			RK73GB2A101J	CHIP R 100 J 1/10W		Q7			DTA143TE	DIGITAL TRANSISTOR	
R404			RK73HB1J474D	CHIP R 470K D 1/16W		Q8			2SC4617(S)	TRANSISTOR	
R405			RK73GB2A334J	CHIP R 330K J 1/10W		Q9			2SC4619(P,Q)	TRANSISTOR	
R406			RK73HB1J474D	CHIP R 470K D 1/16W		Q100			2SC4619(P,Q)	TRANSISTOR	
R407			RK73HB1J334J	CHIP R 330K J 1/16W		Q101			2SK3077F	FET	
R408-412			RK73HB1J473J	CHIP R 47K J 1/16W		Q102			2SK2596	FET	
R413,414			RK73GB2A331J	CHIP R 330 J 1/10W		Q103			2SK3476-F	FET	
R415,416			RK73GB2A473J	CHIP R 47K J 1/10W		Q104			DTC114EE	DIGITAL TRANSISTOR	
R417-420			RK73HB1J473J	CHIP R 47K J 1/16W		Q105			2SK879(Y)F	FET	
R421,422			RK73HB1J102J	CHIP R 1.0K J 1/16W		Q107			DTC114EE	DIGITAL TRANSISTOR	
R423			RK73HB1J000J	CHIP R 0.0 J 1/16W							

PARTS LIST

TX-RX UNIT (X57-6890-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
Q108			2SK1824-A	FET							
Q109			DTA144EE	DIGITAL TRANSISTOR							
Q202			DTA144EE	DIGITAL TRANSISTOR							
Q203			2SC4649(N,P)	TRANSISTOR							
Q204,205			3SK318	FET							
Q301			DTA114EE	DIGITAL TRANSISTOR							
Q302			2SC4919	TRANSISTOR							
Q303			DTC144EE	DIGITAL TRANSISTOR							
Q304			2SA1362-F(GR)	TRANSISTOR							
Q305			DTC144EE	DIGITAL TRANSISTOR							
Q306			2SK3577-A	FET							
Q316			2SK3577-A	FET							
Q401,402			DTC114EE	DIGITAL TRANSISTOR							
Q403,404			CPH3317	FET							
Q405			DTA123JE	DIGITAL TRANSISTOR							
Q407,408			2SK1830F	FET							
Q901			2SK1824-A	FET							
TH101			157-104-65001	THERMISTOR							
TH203			157-104-65001	THERMISTOR							

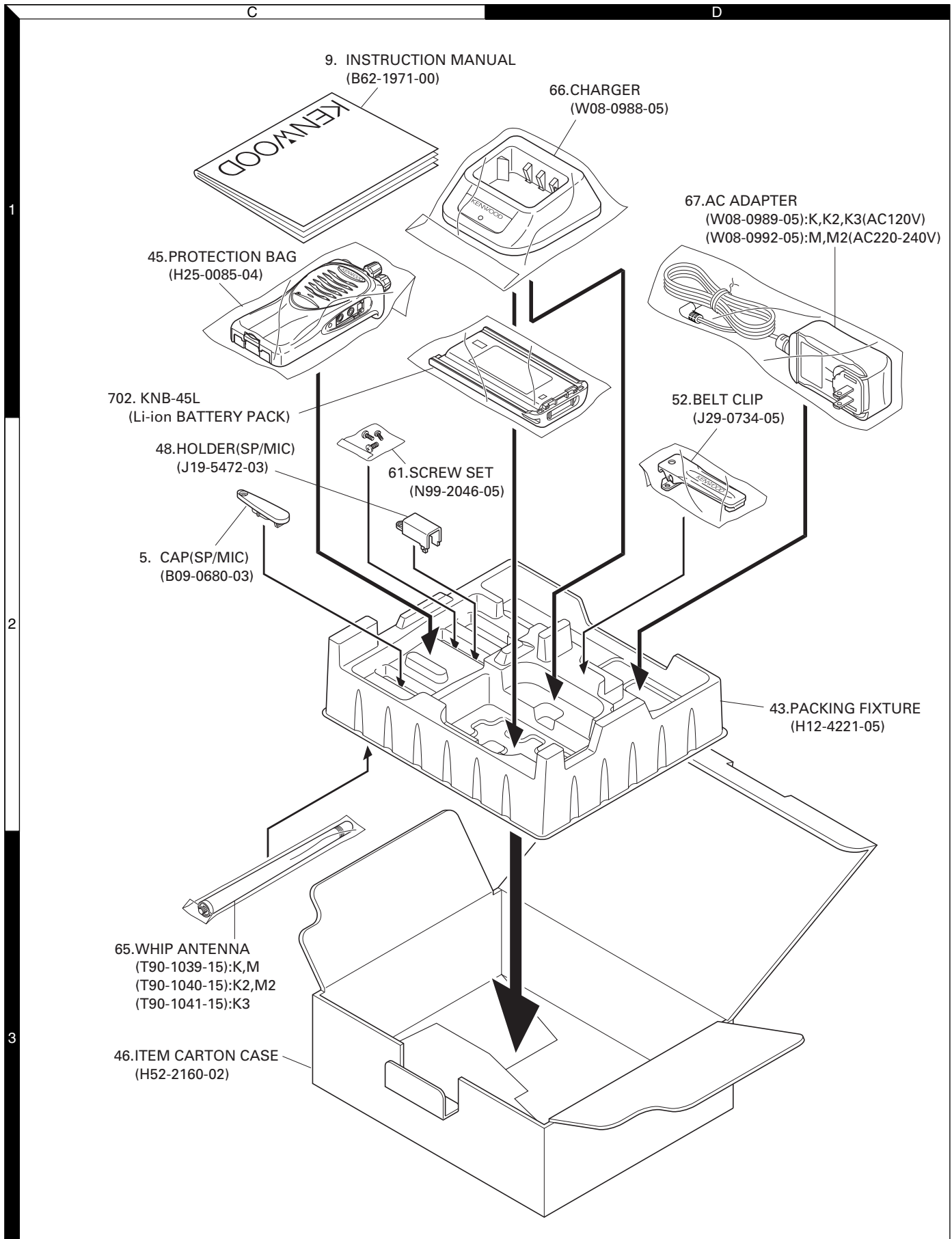
EXPLODED VIEW



- A :N14-0819-04
- B :N14-0832-04
- C :N30-2604-48
- D :N30-2606-48
- E :N83-2005-48

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

PACKING



ADJUSTMENT

Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range	450 to 490MHz (K, M) 470 to 512MHz (K2, M2) 400 to 430MHz (K3)
	Modulation	Frequency modulation and external modulation
	Output	-127dBm/0.1μV to greater than -47dBm/1mV
2. Power Meter	Input Impedance	50Ω
	Operation Frequency	450 to 490MHz (K, M) 470 to 512MHz (K2, M2) 400 to 430MHz (K3)
	Measurement Range	Vicinity of 10W
3. Deviation Meter	Frequency Range	450 to 490MHz (K, M) 470 to 512MHz (K2, M2) 400 to 430MHz (K3)
4. Digital Volt Meter (DVM)	Measuring Range	10mV to 10V DC
	Input Impedance	High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range	10Hz to 1000MHz
	Frequency Stability	0.2ppm or less
7. Ammeter		5A
8. AF Volt Meter (AF VTVM)	Frequency Range	50Hz to 10kHz
	Voltage Range	1mV to 10V
9. Audio Generator (AG)	Frequency Range	50Hz to 5kHz or more
	Output	0 to 1V
10. Distortion Meter	Capability	3% or less at 1kHz
	Input Level	50mV to 10Vrms
11. Spectrum Analyzer	Measuring Range	DC to 1GHz or more
12. Tracking Generator	Center frequency	50kHz to 600MHz
	Output Voltage	100mV or more
13. 8Ω Dummy Load		Approx. 8Ω, 3W
14. Regulated Power Supply		5V to 10V, approx. 3A Useful if ammeter equipped

■ The following parts are required for adjustment

1. Antenna connector adapter

The antenna connector of this transceiver uses an SMA terminal.

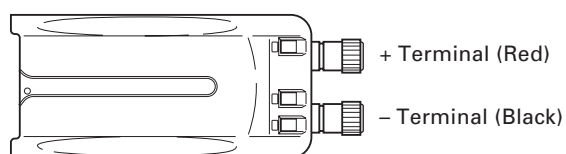
Use an antenna connector adapter [SMA(f) – BNC(f) or SMA(f) – N(f)] for adjustment. (The adapter is not provided as an option, so buy a commercially-available one.)

2. Repair Jig (Chassis)

Use jig (part No.: A10-4086-03) for repairing the transceiver. Place the TX-RX unit on the jig and fit it with screws.

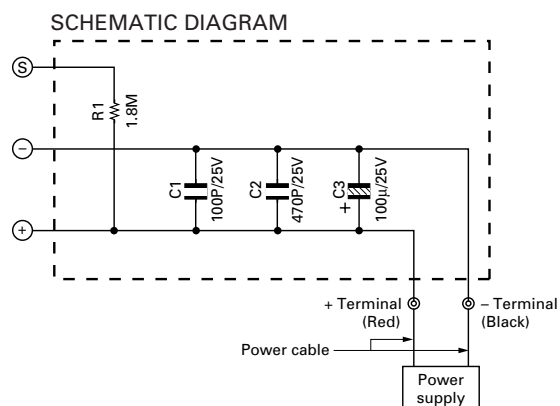
The jig facilitates the voltage check and protects the final amplifier FET when the voltage on the flow side of the TX-RX unit is checked during repairs.

3. Battery Jig (W05-1011-00)



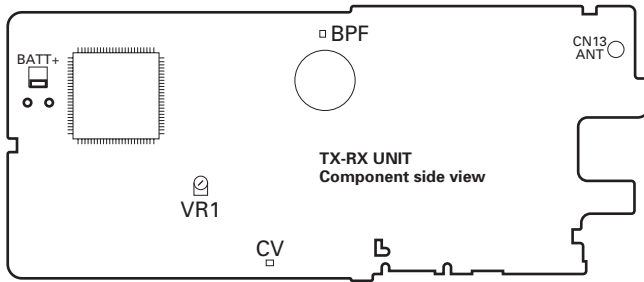
Connect the power cable properly between the battery jig installed in the transceiver and the power supply, and be sure output voltage and the power supply polarity prior to switching the power supply ON, otherwise over voltage and reverse connection may damage the transceiver, or the power supply or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

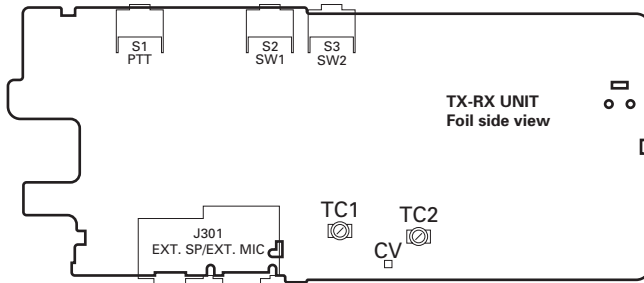
Adjustment points



VR1 : Frequency adjustment

BPF : Band-pass wave form test point

CV : Lock voltage adjustment terminal



TC1 : Transmit lock voltage adjustment

TC2 : Receive lock voltage adjustment

CV : Lock voltage adjustment terminal

Frequency and signaling

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

Frequency (MHz) K, M type

Channel No.	RX Frequency	TX Frequency
1	470.050	470.100
2	450.050	450.100
3	489.950	489.900
4	470.000	470.000
5	470.200	470.200
6	470.400	470.400
7~16	—	—

Frequency (MHz) K2, M2 type

Channel No.	RX Frequency	TX Frequency
1	491.050	491.100
2	470.050	470.100
3	511.950	511.900
4	491.000	491.000
5	491.200	491.200
6	491.400	491.400
7~16	—	—

Frequency (MHz) K3 type

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 159D	DTMF 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 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	K, M type	
	RX Frequency	TX Frequency
Low	450.050MHz	450.100MHz
Low'	460.050MHz	460.100MHz
Center	470.050MHz	470.100MHz
High'	480.050MHz	480.100MHz
High	489.950MHz	489.900MHz

TEST CH	K2, M2 type	
	RX Frequency	TX Frequency
Low	470.050MHz	470.100MHz
Low'	480.550MHz	480.600MHz
Center	491.050MHz	491.100MHz
High'	501.550MHz	501.600MHz
High	511.950MHz	511.900MHz

TEST CH	K3 type	
	RX Frequency	TX Frequency
Low	400.050MHz	400.100MHz
Low'	407.550MHz	407.600MHz
Center	415.050MHz	415.100MHz
High'	422.550MHz	422.600MHz
High	429.950MHz	429.900MHz

ADJUSTMENT

Common Section

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	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	ANT C V	TC2	3.4V K, M 3.0V K2, M2, K3	±0.1V
	2) CH:Low				Check	0.6V or more
3.VCO lock voltage TX	3) CH:High PTT:ON			TC1	3.1V K, M 3.0V K2, M2, K3	±0.1V
	4) CH:Low PTT:ON				Check	0.6V or more

Transmitter Section

Item	Condition	Measurement		Adjustment		Specifications/ Remark	
		Test equipment	Terminal	Parts	Method		
1. Frequency Adjust	1) CH:High 2) PTT:ON	Frequency counter	ANT	VR1	High frequency ±50Hz	Note: After replacing the TCXO (X1) align frequency.	
2.High power Adjust	TEST CH: Low Low' Center High' High (5 points) BATT terminal voltage:7.5V PTT:ON	Power meter Ammeter		Programming Software:KPG-87D		4.0W K, M, K3 3.8W K2, M2	±0.1W 2.0 A or less
3.Low power Adjust	TEST CH: Low Low' Center High' High (5 points) BATT terminal voltage:7.5V PTT:ON					1.05W	±0.1W 1.0 A or less
4.DQT balance Adjust [Wide]	TEST CH: Center Low High (3 points) LPF:3kHz HPF:OFF PTT:ON					Power meter Deviation meter Oscilloscope AG AF VTVM	Make the demodulation wave into square waves.
	[Narrow]	TEST CH:Center PTT:ON					

ADJUSTMENT

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
5. Max deviation Adjust [Wide]	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 SP/MIC connector	Programming Software:KPG-87D	4.2kHz (According to the larger +,-)	±80Hz
	[Narrow]				2.2kHz (According to the larger +,-)	±80Hz
6. VOX 1 Writing	TEST CH: Center AG:1kHz/45mV					
7. QT deviation Adjust [Wide]	TEST CH: Center Low High (3 points) LPF:3kHz HPF:OFF PTT:ON		ANT	Programming Software:KPG-87D	0.75kHz	±40Hz
	[Narrow]				0.38kHz	±40Hz
8. DQT deviation Adjust [Wide]	TEST CH: Center Low High (3 points) LPF:3kHz HPF:OFF PTT:ON				0.75kHz	±40Hz
	[Narrow]				0.38kHz	±40Hz
9. DTMF deviation Adjust [Wide]	TEST CH: Center LPF:15kHz HPF:OFF PTT:ON				3.0kHz	±100Hz
	[Narrow]				1.5kHz	±100Hz
10. MSK deviation Adjust [Wide]	TEST CH: Center Low High (3 points) LPF:15kHz HPF:OFF PTT:ON				3.1kHz	±100Hz
	[Narrow]				1.5kHz	±100Hz

ADJUSTMENT

Receiver Section

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
1.BPF Wave Adjust TK-3202L (K,M)	(1)Center frequency Spectrum analyzer setting Center-f : 470MHz Span : 100MHz RBW : 300kHz VBW : 10kHz ATT : 5dB (2)High-edge frequency Spectrum analyzer setting Center-f : 490MHz (3)Low-edge frequency Spectrum analyzer setting Center-f : 450MHz	Spectrum analyzer	ANT BPF	Programming Software: KPG-87D	Adjust the waveform as shown to the right.	
TK-3202L (K3)	(1)Center frequency Spectrum analyzer setting Center-f : 415MHz Span : 100MHz RBW : 300kHz VBW : 10kHz ATT : 5dB (2)High-edge frequency Spectrum analyzer setting Center-f : 430MHz (3)Low-edge frequency Spectrum analyzer setting Center-f : 400MHz					
TK-3202L (K2,M2)	(1)Center frequency Spectrum analyzer setting Center-f : 491MHz Span : 100MHz RBW : 300kHz VBW : 10kHz ATT : 5dB (2)High-edge frequency Spectrum analyzer setting Center-f : 512MHz (3)Low-edge frequency Spectrum analyzer setting Center-f : 470MHz					

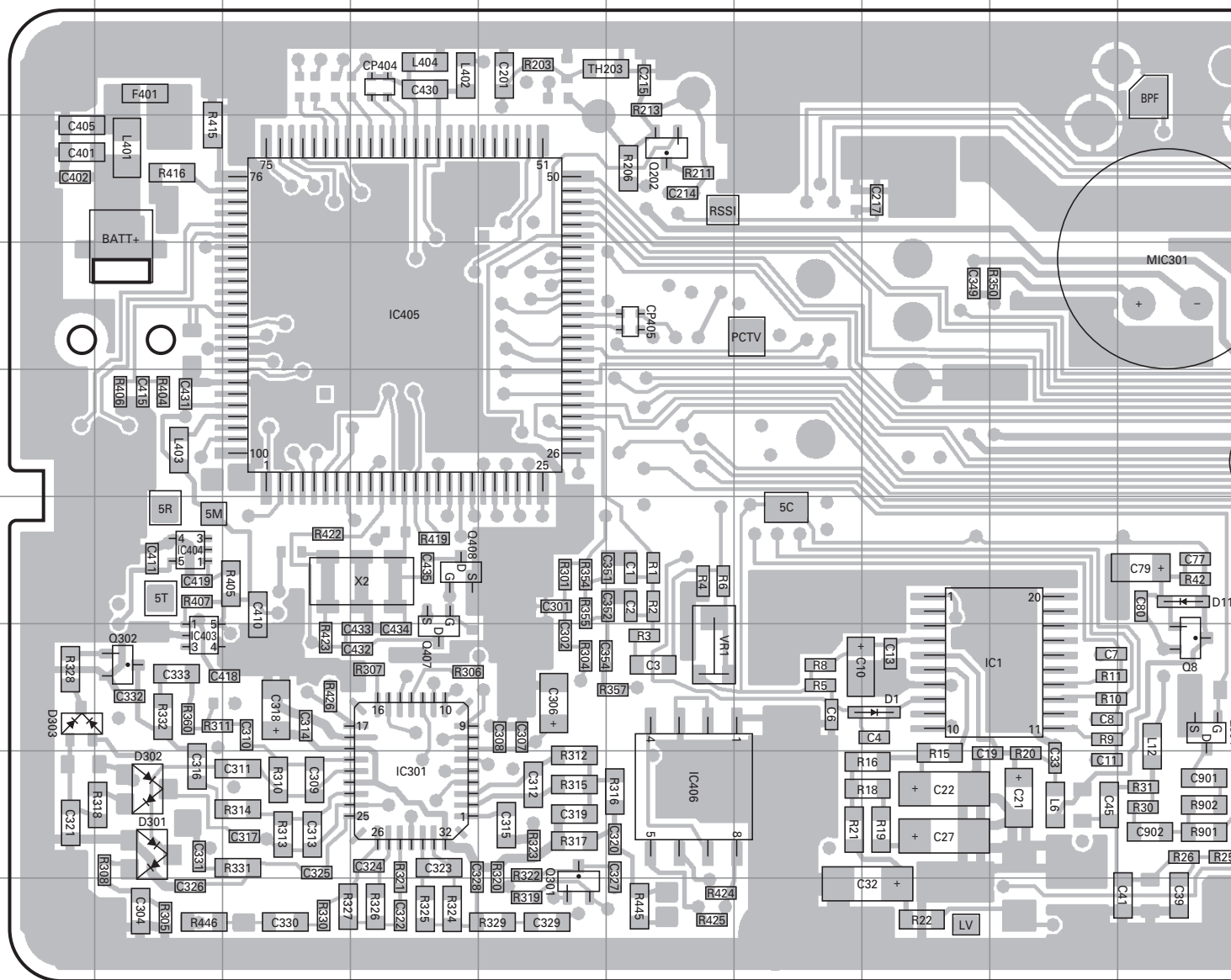
ADJUSTMENT

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
2.Sensitivity Check [Wide]	TEST CH: Low Center High SSG otuput: -117 dBm(0.3μV) SSG MOD:3.0kHz	SSG DVM Oscilloscope AF VTVM	ANT		Check	12dB SINAD or more
[Narrow]	TEST CH: Center SSG otuput: -115 dBm(0.4μV) SSG MOD:1.5kHz					
3.SQL1 (Threshold) Writing [Wide]	TEST CH: Center Low High SSG otuput: -123 dBm(0.16μV) K, M, K3 -122 dBm(0.18μV) K2, M2 SSG MOD:3.0kHz			Programming Software: KPG-87D	Write	Squelch open
[Narrow]	TEST CH: Center SSG otuput: -122 dBm(0.18μV) SSG MOD:1.5kHz					
4.SQL9 (Tight) Writing [Wide]	TEST CH: Center Low High SSG otuput: -117 dBm(0.3μV) K, M, K3 -116 dBm(0.35μV) K2, M2 SSG MOD:3.0kHz					
[Narrow]	TEST CH: Center SSG otuput: -116 dBm(0.35μV) SSG MOD:1.5kHz					
5.BATT detection Writing	BATT terminal voltage:5.9V	DVM	ANT BATT terminal		Write	BATT terminal voltage:5.9V

TK-3202L PC BOARD

TX-RX UNIT (X57-6890-XX) Component side view (J79-0045-09)

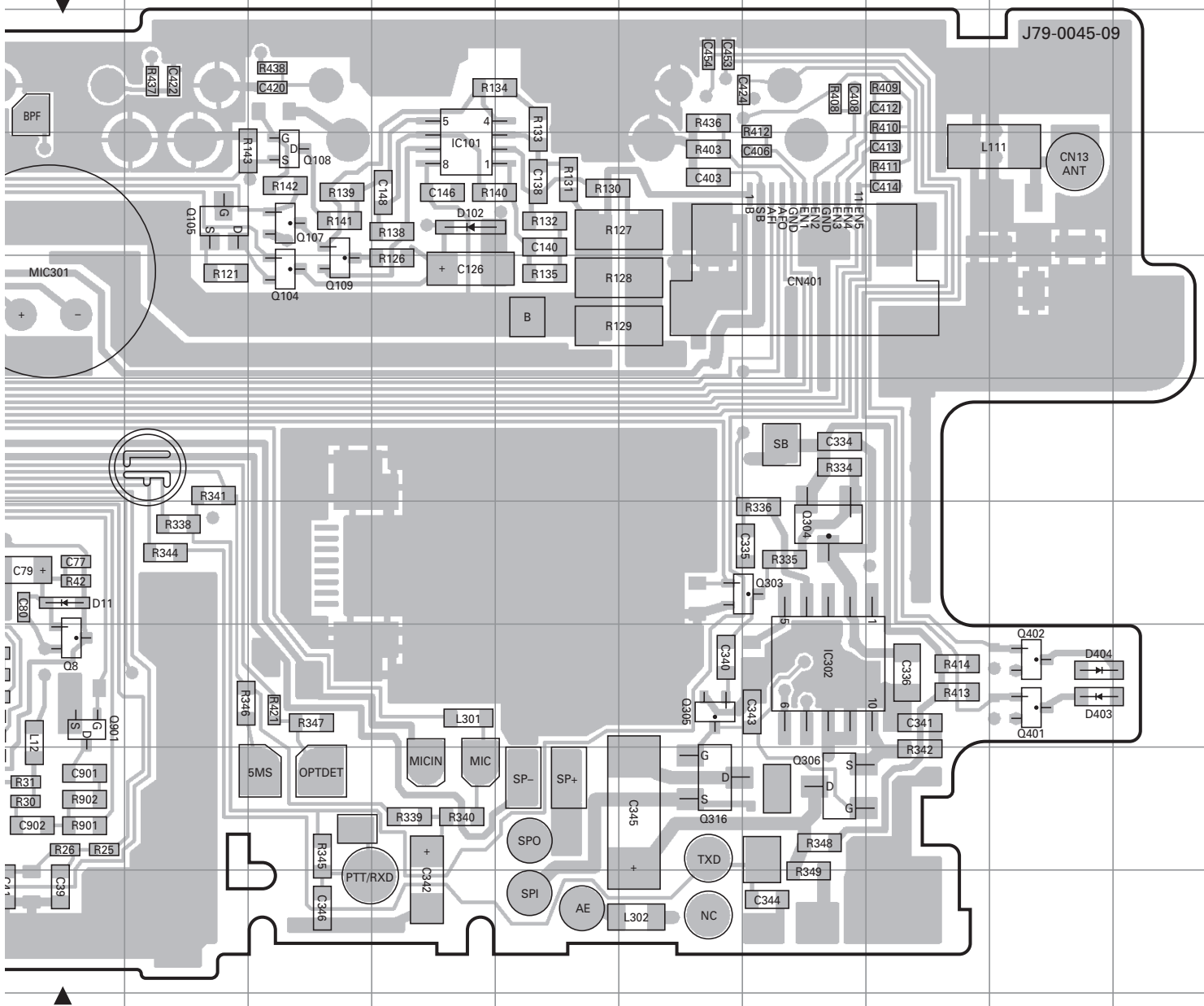
-26 : K,M -27 : K2,M2 -28 : K3



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	8I	Q104	5L	Q304	7P	D1	8H
IC101	4M	Q105	4K	Q305	8O	D11	7J
IC301	9D	Q107	4L	Q306	9P	D102	4M
IC302	8P	Q108	4L	Q316	9O	D301	9B
IC403	8B	Q109	5L	Q401	8R	D302	9B
IC404	7B	Q202	4F	Q402	8R	D303	8A
IC405	5D	Q301	10E	Q407	8D	D403	8R
IC406	9F	Q302	8B	Q408	7D	D404	8R
Q8	8J	Q303	7P	Q901	8J		

PC BOARD TK-3202L

TX-RX UNIT (X57-6890-XX) Component side view (J79-0045-09)
-26 : K,M -27 : K2,M2 -28 : K3



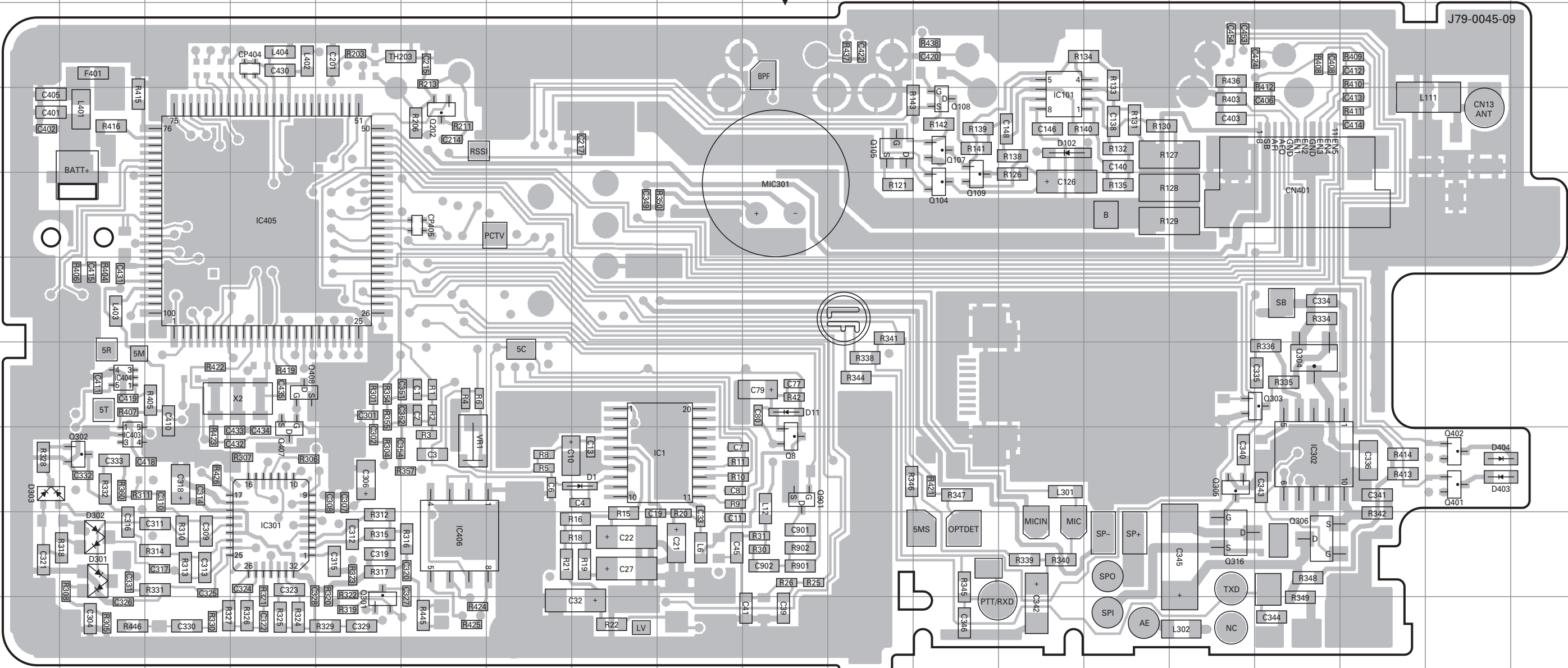
Component side
 Layer 1
 Layer 2
 Layer 3
 Layer 4
 Foil side

TK-3202L PC BOARD

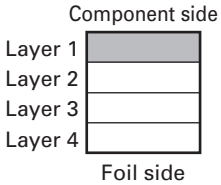
PC BOARD TK-3202L

TX-RX UNIT (X57-6890-XX) Component side view (J79-0045-09)
-26 : K,M -27 : K2,M2 -28 : K3

TX-RX UNIT (X57-6890-XX) Component side view (J79-0045-09)
-26 : K,M -27 : K2,M2 -28 : K3



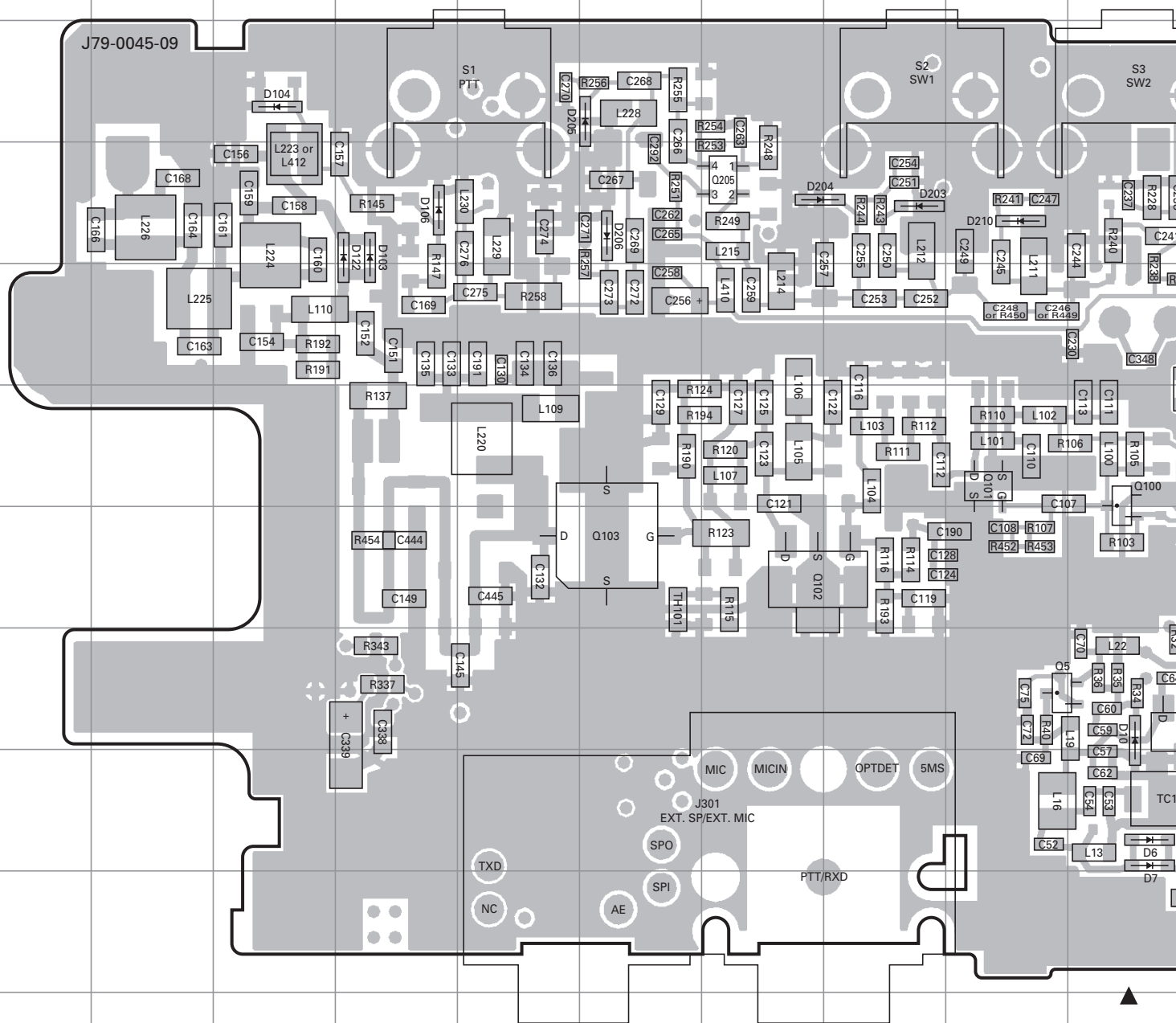
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	8I	Q104	5L	Q304	7P	D1	8H
IC101	4M	Q105	4K	Q305	8O	D11	7J
IC301	9D	Q107	4L	Q306	9P	D102	4M
IC302	8P	Q108	4L	Q316	9O	D301	9B
IC403	8B	Q109	5L	Q401	8R	D302	9B
IC404	7B	Q202	4F	Q402	8R	D303	8A
IC405	5D	Q301	10E	Q407	8D	D403	8R
IC406	9F	Q302	8B	Q408	7D	D404	8R
Q8	8J	Q303	7P	Q901	8J		



TK-3202L PC BOARD

TX-RX UNIT (X57-6890-XX) Foil side view (J79-0045-09)

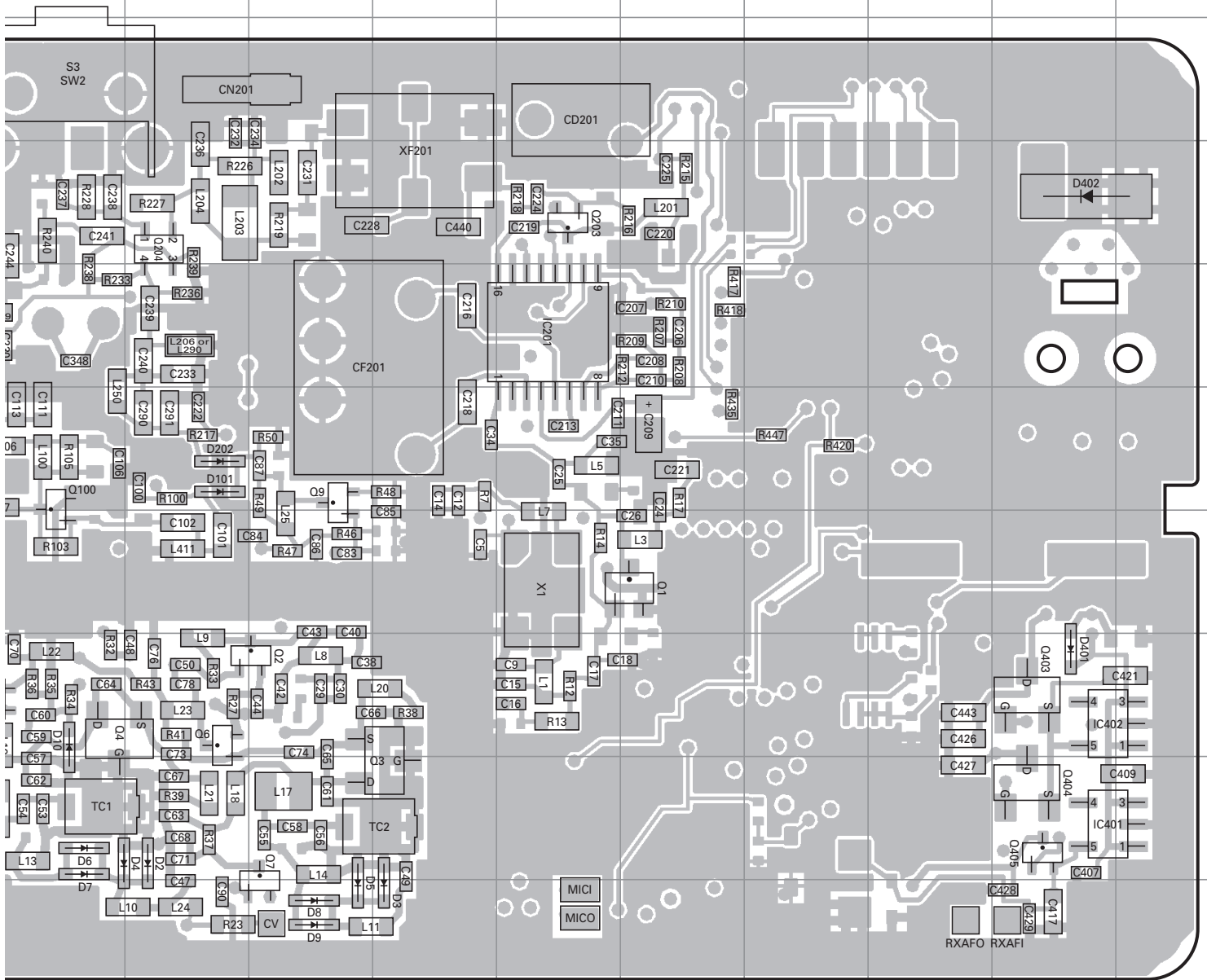
-26 : K,M -27 : K2,M2 -28 : K3



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC201	5N	Q6	8K	Q204	4K	D5	10L	D104	3C	D210	4I
IC401	9R	Q7	9L	Q205	4G	D6	9J	D106	4D	D401	8R
IC402	8R	Q9	6L	Q403	8R	D7	9J	D122	4D	D402	4R
Q1	7O	Q100	6J	Q404	9R	D8	10L	D202	6K		
Q2	8L	Q101	6I	Q405	9R	D9	10L	D203	4H		
Q3	9M	Q102	7G	D2	9K	D10	8J	D204	4G		
Q4	8J	Q103	7F	D3	10M	D101	6K	D205	3F		
Q5	8I	Q203	4N	D4	9J	D103	4D	D206	4F		

PC BOARD TK-3202L

TX-RX UNIT (X57-6890-XX) Foil side view (J79-0045-09)
-26 : K,M -27 : K2,M2 -28 : K3



Component side

Diagram illustrating a four-layered structure:

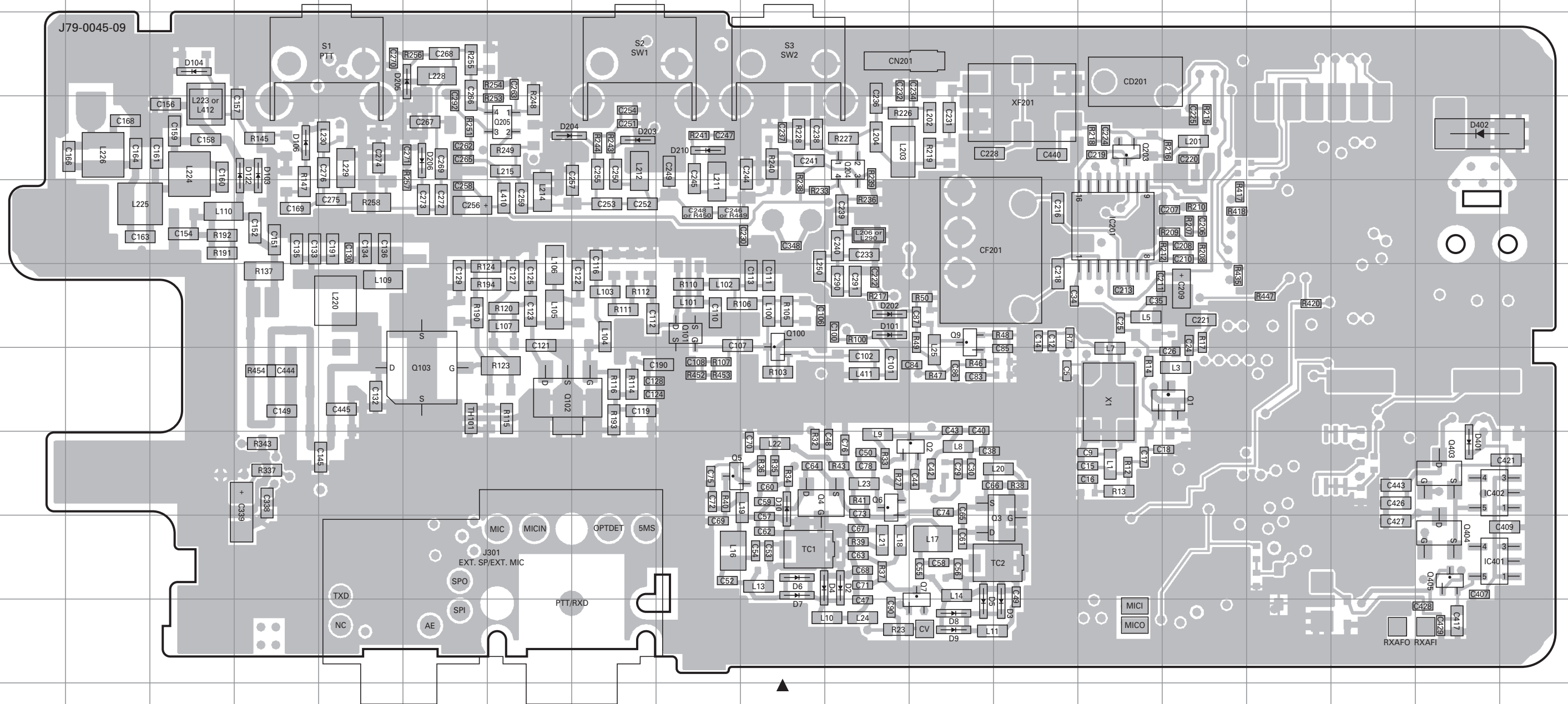
- Layer 1
- Layer 2
- Layer 3
- Layer 4 (Foil side)

TK-3202L PC BOARD

PC BOARD TK-3202L

TX-RX UNIT (X57-6890-XX) Foil side view (J79-0045-09)
-26 : K,M -27 : K2,M2 -28 : K3

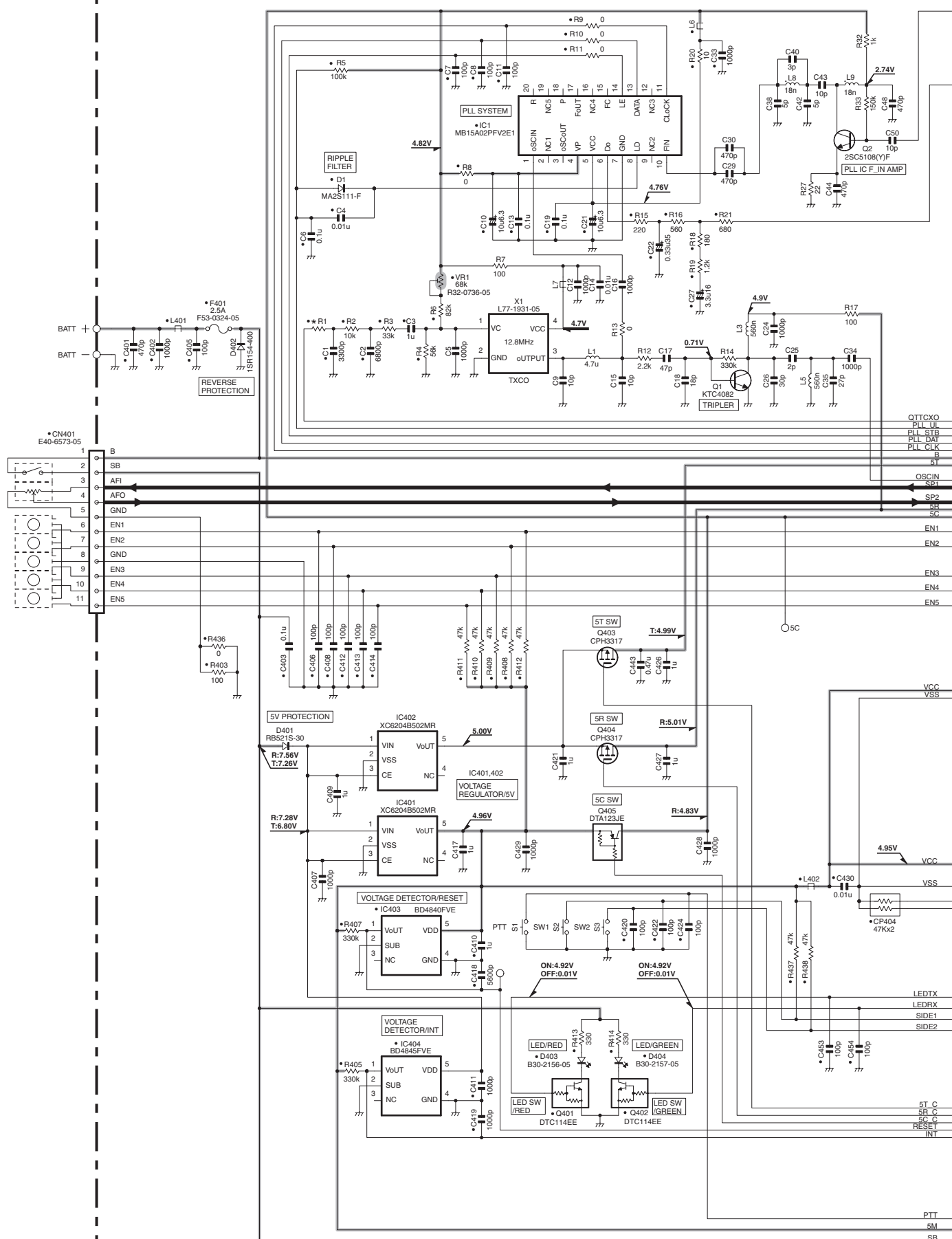
TX-RX UNIT (X57-6890-XX) Foil side view (J79-0045-09)
-26 : K,M -27 : K2,M2 -28 : K3



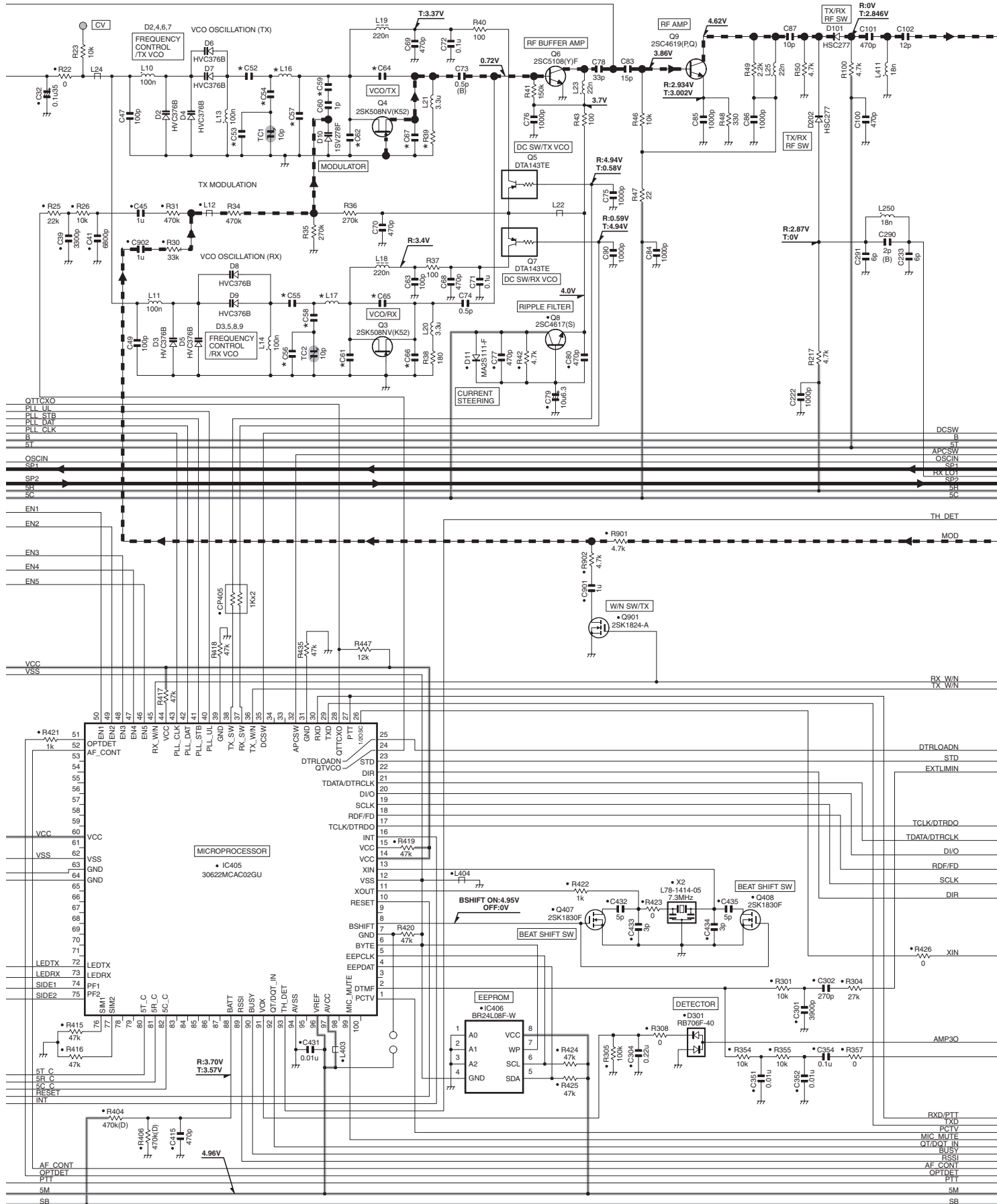
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC201	5N	Q6	8K	Q204	4K	D5	10L	D104	3C	D210	4I
IC401	9R	Q7	9L	Q205	4G	D6	9J	D106	4D	D401	8R
IC402	8R	Q9	6L	Q403	8R	D7	9J	D122	4D	D402	4R
Q1	7O	Q100	6J	Q404	9R	D8	10L	D202	6K		
Q2	8L	Q101	6I	Q405	9R	D9	10L	D203	4H		
Q3	9M	Q102	7G	D2	9K	D10	8J	D204	4G		
Q4	8J	Q103	7F	D3	10M	D101	6K	D205	3F		
Q5	8I	Q203	4N	D4	9J	D103	4D	D206	4F		

TK-3202L SCHEMATIC DIAGRAM

TX-RX UNIT (X57-6890-XX)



TX-RX UNIT (X57-6890-XX)



SCHEMATIC DIAGRAM TK-3202L

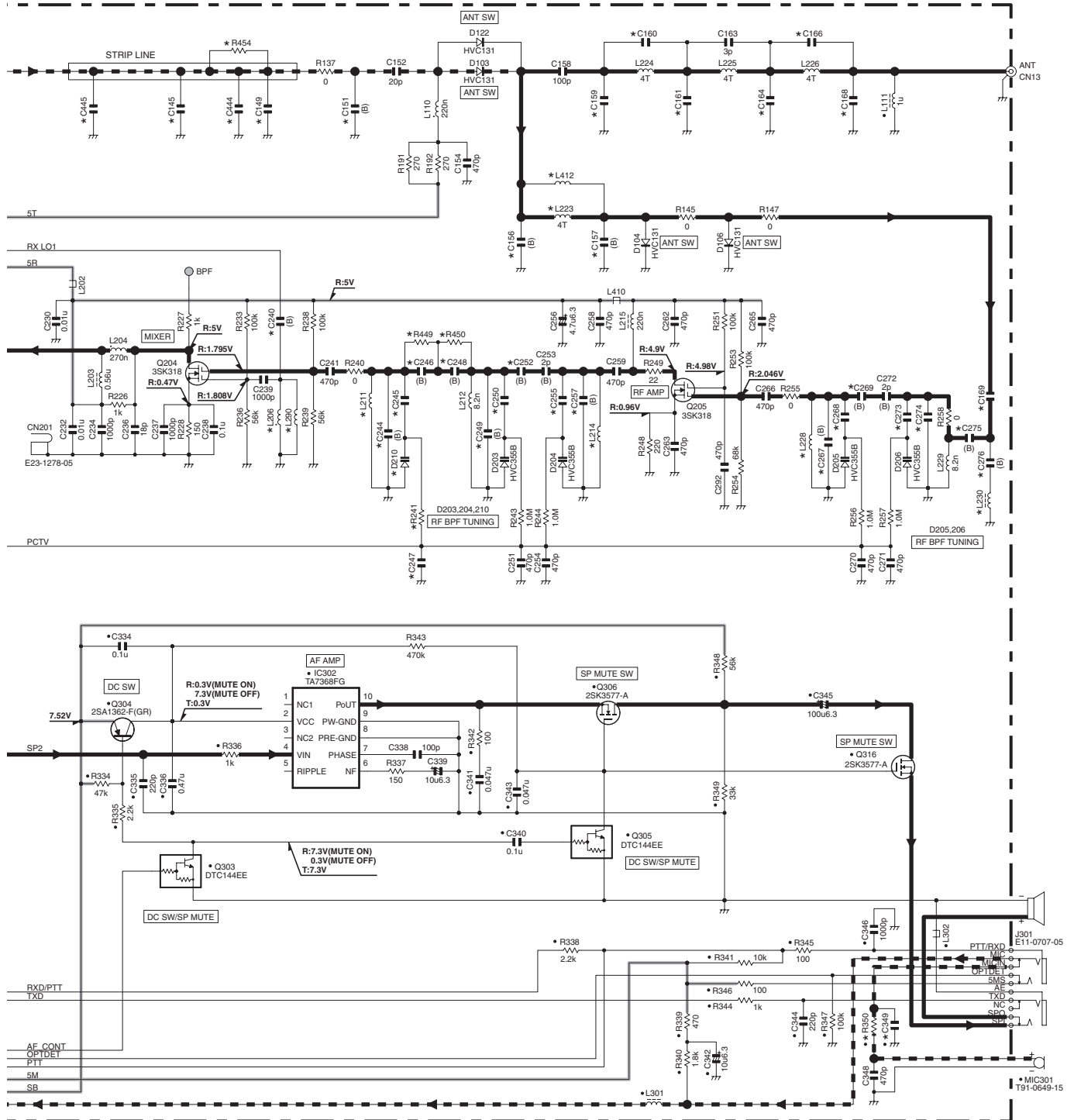
X57-6890-XX	D210	C52	C53	C54	C55	C56	C57	C58	C59	C61	C62	C64	C65	C66	C67	C107	C116	C121	C125	C127	C132	C145	C149	C151	C156	C157	C159	
-26	K,M	HVC355B	11p	2p	6p	11p	2p	NO	6p	1p	3p	2p	4p	6p	6p	5p	6p	11p	NO	6p	20p	20p	18p	7p	NO	4p	2.5p	2p
-27	K2,M2	HVC355B	13p	2p	9p	12p	NO	NO	9p	1p	4p	2p	5p	5p	6p	5p	6p	11p	NO	6p	20p	27p	18p	NO	7p	3.5p	4p	
-28	K3	NO	11p	4p	7p	12p	5p	0.5p	7p	1.5p	4p	3p	4p	5p	5p	4p	7p	3p	12p	11p	NO	39p	30p	7p	7p	3p	4p	2p

X57-6890-XX	C160	C161	C164	C166	C168	C169	C240	C244	C245	C246	C247	C248	C249	C250	C252	C255	C257	C267	C268	C269	C273	C274	C275	C276	C349	C444	C445	
-26	K,M	2p	5p	5p	0.75p	1p	4p	3.5p	3p	22p	1p	470p	2p	6p	22p	2p	4.5p	3.5p	22p	2p	22p	1p	2p	3.5p	NO	NO	NO	
-27	K2,M2	1.5p	6p	6p	1.5p	0.3p	3p	3.5p	3.5p	18p	0.75p	470p	1p	6p	18p	0.75p	18p	6p	5p	18p	2.5p	18p	2p	9p	4p	NO	NO	20p
-28	K3	2p	5p	5p	0.75p	NO	10p	1p	NO	NO	NO	NO	NO	5p	22p	1.5p	22p	7p	6p	22p	2p	22p	4p	2p	4p	0.033u	2p	NO

X57-6890-XX	L16	L17	L100	L101	L105	L107	L206	L211	L214	L223	L228	L230	L290	L412	R1	R39	R103	R106	R114	R120	R194	R241	R350	R449	R450	R454	
-26	K,M	22n	27n	15n	15n	15n	1.2n	NO	8.2n	8.2n	L34-4572-05	8.2n	47n	30n	NO	22k	150	47k	22	47k	NO	47k	1.0M	0	NO	NO	NO
-27	K2,M2	18n	22n	15n	15n	22n	1.2n	27n	8.2n	6.8n	L34-4572-05	6.8n	47n	NO	NO	100k	180	47k	22	120k	NO	47k	1.0M	0	NO	NO	0
-28	K3	27n	33n	33n	22n	15n	NO	39n	NO	8.2n	NO	8.2n	56n	NO	L34-4564-05	22k	150	33k	120	68k	0	68k	NO	10k	0	0	NO

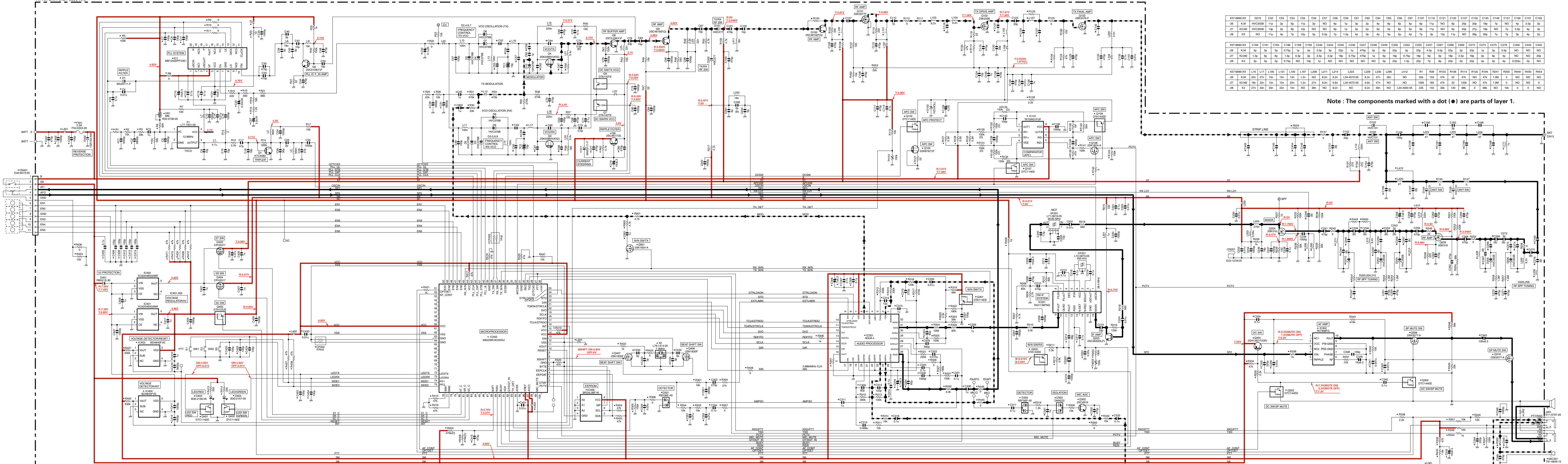
Note : The components marked with a dot (●) are parts of layer 1.

TX-RX UNIT (X57-6890-XX)

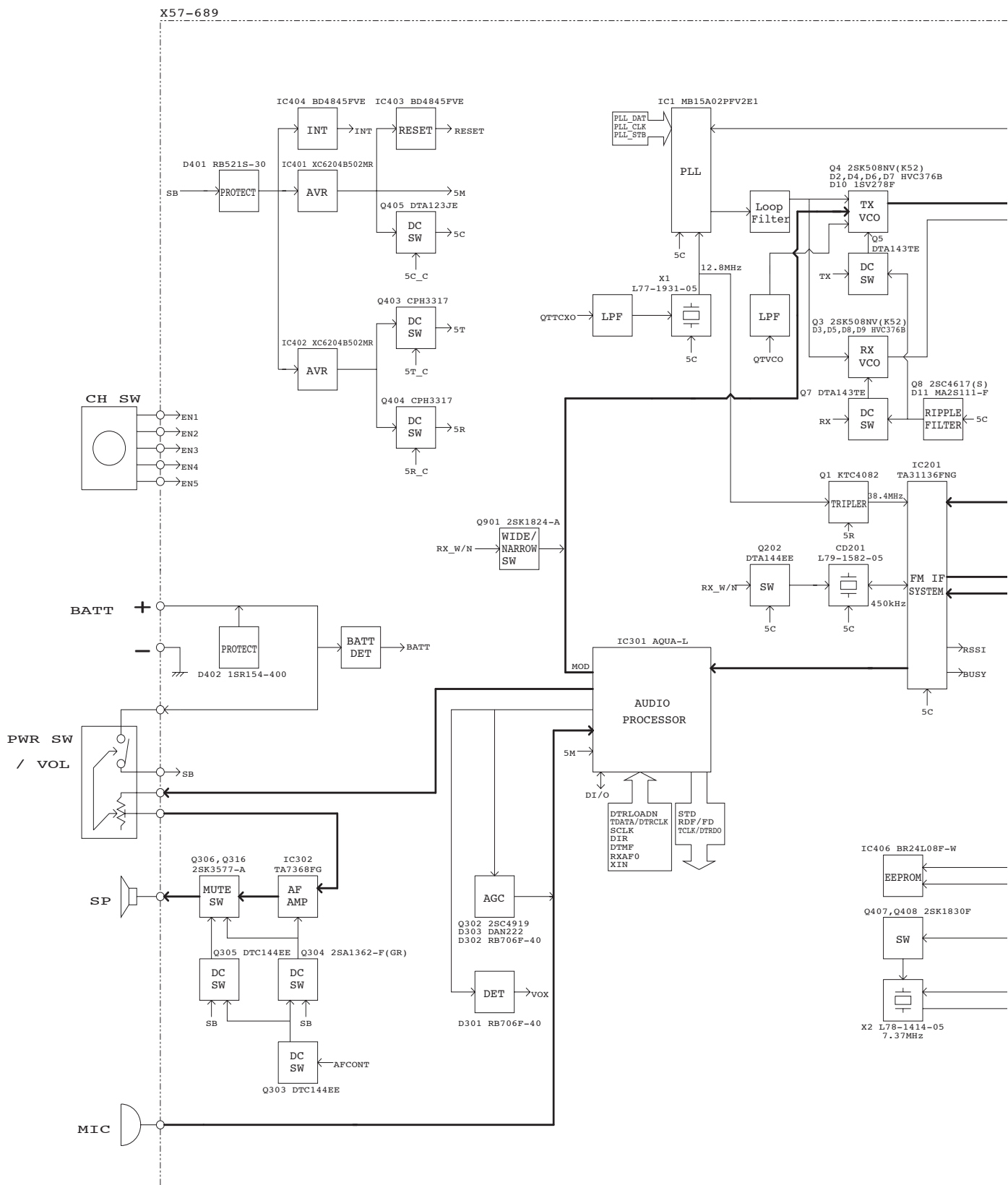


TK-3202L SCHEMATIC DIAGRAM

TX-RX UNIT (X57-6890-XX)



BLOCK DIAGRAM

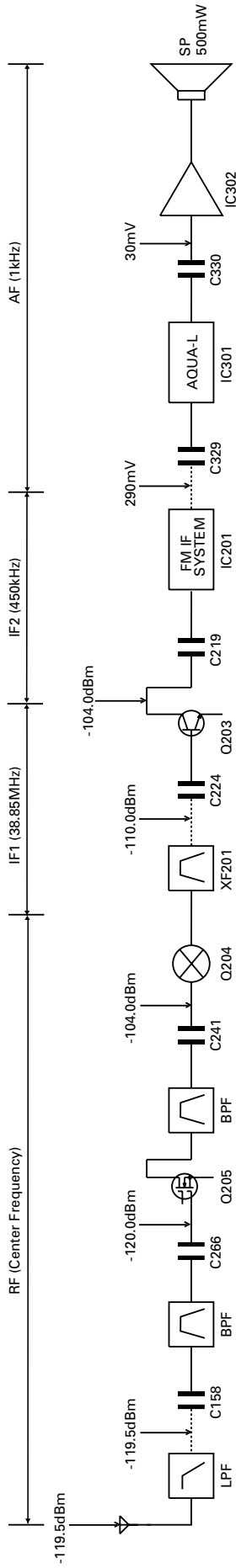


BLOCK DIAGRAM



LEVEL DIAGRAM

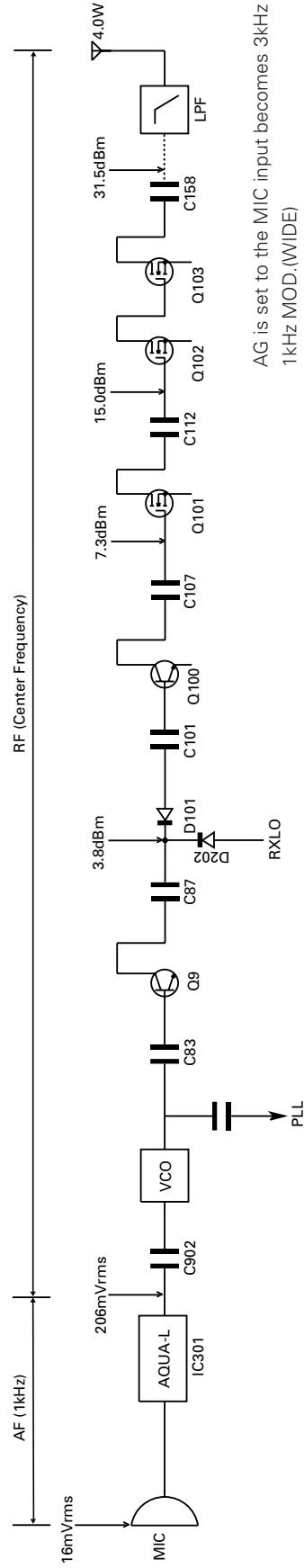
Receiver Section



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 1000pF coupling capacitor. (The display shows the SSG input value required to obtain 12dB SINAD without local level.)

Transmitter Section



AG is set to the MIC input becomes 3kHz DEV at 1kHz MOD. (WIDE)

To make measurements in the AF section, connect the AC level meter.

In the RF section, use 1000pF coupling capacitor.

OPTIONAL ACCESSORIES

KSC-35 (RAPID CHARGER)

■ External View



■ Specifications

Charging time KNB-45L : Approx.180 minutes

Dimensions (Charger only) 86.3W x 43.2H x 100.0D (mm)

3-3/8W x 1-45/64 x 4D (inches)

Weight (Charger only) Approx. 90g / 0.2 lbs

KNB-45L (Li-ion BATTERY PACK)

■ External View

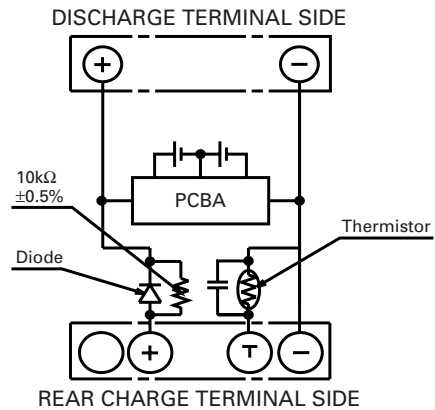


■ Specifications

Voltage 7.4V (3.7V x 2)

Battery capacity... 2000mAh

■ Schematic Diagram



SPECIFICATIONS

General

Frequency Range	450~490MHz (K,M) 470~512MHz (K2,M2) 400~430MHz (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 $\pm 20\%$
Battery Life (5-5-90 duty cycle with battery saver on) With KNB-45L (2000mAh battery)	Approx. 18 hours
Operating Temperature Range	-30°C to +60°C (-22 °F to +140 °F)
Frequency Stability	$\pm 2.5\text{ppm}$ (-30°C to +60°C)
Channel Frequency Spread	40MHz (K,M) 42MHz (K2,M2) 30MHz (K3)
Dimensions and Weight (Dimensions not including protrusions)	
Radio Only	54 (2-1/8) W x 122 (4-13/16) H x 21.1 (13/16) D mm (inches) 160g (0.35lbs)
With KNB-45L (2000mAh battery)	54 (2-1/8) W x 122 (4-13/16) H x 33 (1-5/16) D mm (inches) 280g (0.62lbs)

Receiver (Measurements made per TIA/EIA-603)

Sensitivity	
EIA 12dB SINAD	0.25 μ V (Wide)/0.28 μ V (Narrow)
Selectivity	70dB (Wide)/60dB (Narrow)
Intermodulation	65dB (Wide)/60dB (Narrow)
Spurious Response	60dB
Audio Power Output	500mW at 8 Ω 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%

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