UHF FM TRANSCEIVER

TK-3000

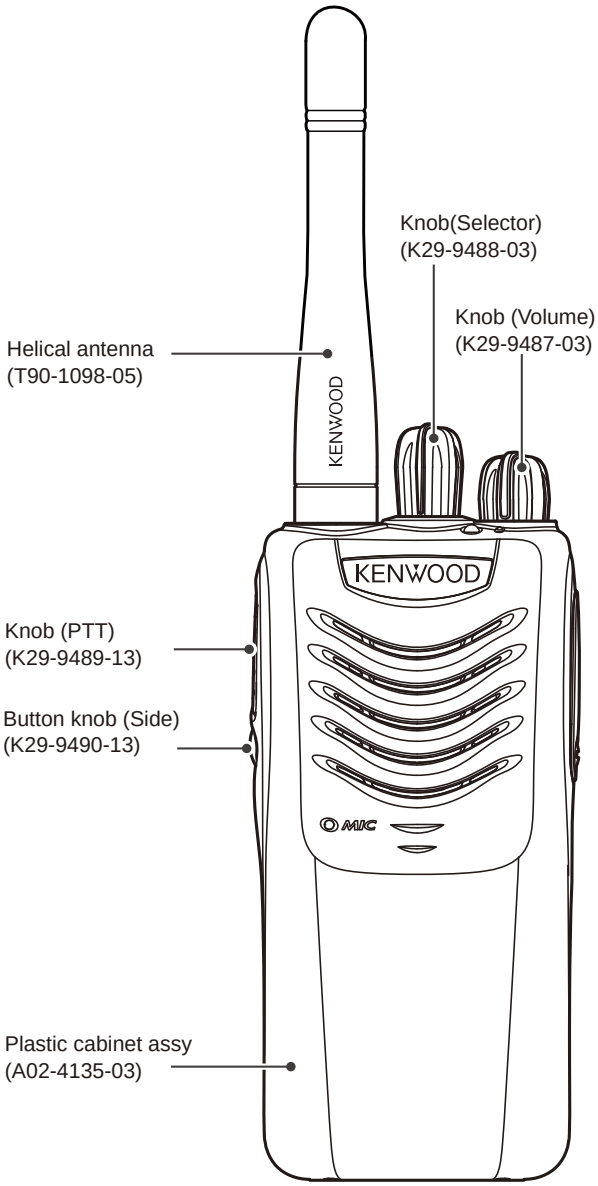
SERVICE MANUAL

M6 version

KENWOOD

Kenwood Corporation

B51-8973-00 (Y) PDF



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

This product uses Lead Free solder.

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GENERAL

INTRODUCTION

SCOPE OF THIS MANUAL

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

ORDERING REPLACEMENT PARTS

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

PERSONAL SAFETY

The following precautions are recommended for personal safety:

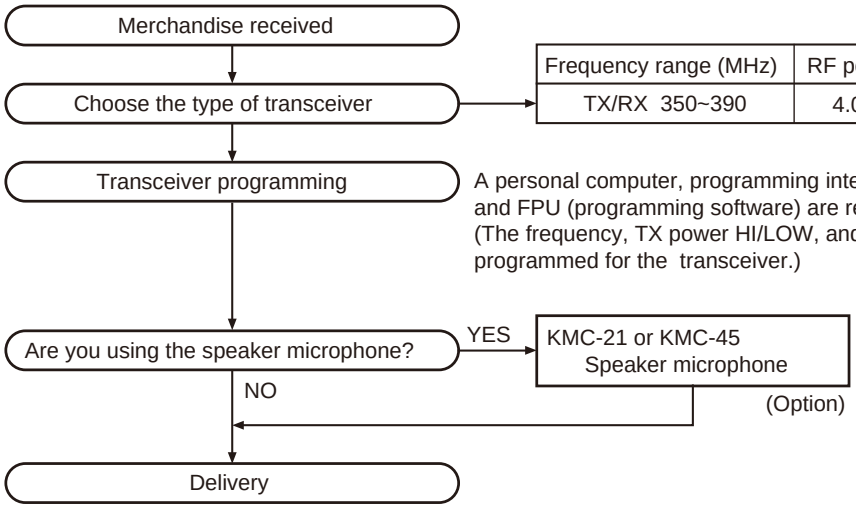
- DO NOT transmit until all RF connectors are verified secure and any open connectors are properly terminated.
- SHUT OFF and DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.
- This equipment should be serviced by a qualified technician only.

SERVICE

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

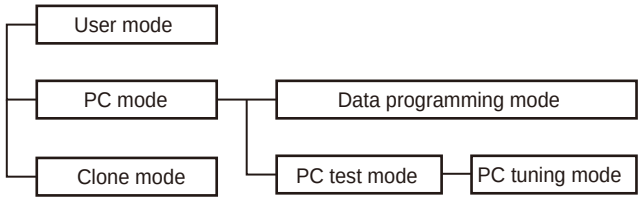
Model	Type	TX-RX unit	Frequency range	Remarks
TK-3000	M6	X57-8100-23	350~390MHz	IF1: 38.85MHz LOC: 38.4MHz

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.
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]+[Side]+Power ON (Two seconds)

3. PC Mode

3-1. Preface

The transceiver is programmed by using a personal computer, a programming interface (KPG-22A/22U, USB adapter (KCT-53U)) and programming software (KPG-137D: ver.1.10 or later).

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

3-2. Connection Procedure

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

REALIGNMENT

Note:
- You must install the KPG-22U driver in the computer to use the USB programming interface cable (KPG-22U).
- 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.

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

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

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

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

3-4. KPG-22U Description (USB programming interface cable: Option)

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

When using the KPG-22U, install the supplied CD-ROM (with driver software) in the computer. The KPG-22U driver runs under Windows XP, Vista or 7.

3-5. 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, XP or Vista (32-bit).

3-6. Programming Software KPG-137D Description

The KPG-137D is the programming software for the transceiver supplied on a CD-ROM. This software runs under windows XP, Vista or 7 on a PC. The software on this disk allows a user to program the transceiver via Programming interface cable (KPG-22A/22U).

Note:
- Use the FPU that matches the market when you first set the market code and model name/frequency data to the service unit. The unit set by mistake cannot be restored.
- Receive frequencies listed below may result in the interference of reception due to the harmonics of internal oscillators. Enter a frequency not listed in the table.

No.	FREQUENCY (MHz)
1	364.79375
2	364.79500
3	364.80000
4	364.80500
5	364.80625
6	383.99375
7	383.99500
8	384.00000
9	384.00500
10	384.00625

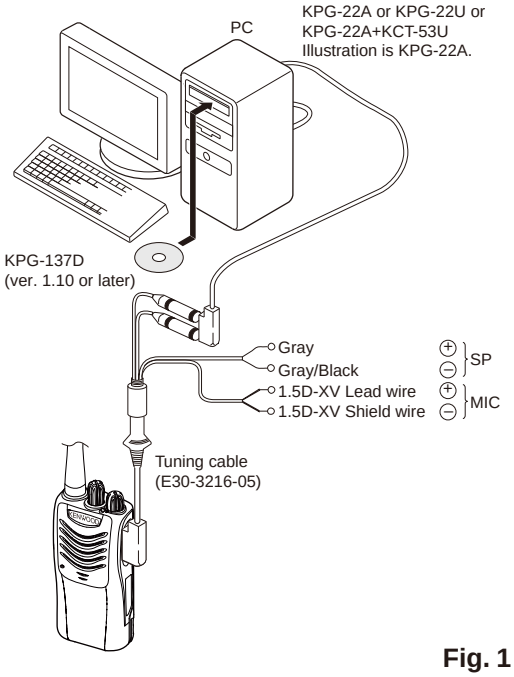
3-7. Programming with PC

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.

REALIGNMENT



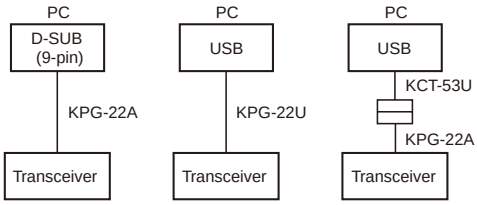


Fig. 1

4. Clone Mode

Programming data can be transferred from one transceiver to another by connecting them via their SP/MIC connectors.

Cloning can be performed as described below (the transmit transceiver is the source and the receive transceiver is the target).

The following data cannot be cloned.
- Tuning data
- Model name data
- ESN data

1. Turn the source transceiver and target transceiver power OFF.
2. Turn the source transceiver power ON while pressing the [PTT] and [Side] keys, to enter clone mode.
3. Connect the cloning cable (part No. E30-3410-05) to the SP/MIC connectors on the source and target transceivers.
4. Turn the target transceiver power ON.
5. Press the [Side] key on the source transceiver. The data of the source is sent to the target. While the source is sending data, red LED will light. While the target is receiving the data, green LED will light. When cloning of data is completed, the source red LED turned off, and the target automatically operates in the User mode.
6. Additional targets can be continuously cloned. When the [Side] key on the source is pressed, the data of the source is sent to the target again. Repeat steps 3 to 5 to clone additional transceivers.

Note:
- The Model name and Market codes must be the same in order to clone the transceiver.
- If the transceivers clone mode is configured as “Disabled”, the transceiver cannot enter clone mode.
- If the Read authorization password is set to the transceiver, the transceiver cannot enter to the clone mode.
- Cannot be cloned if the password (overwrite password) is programmed to the target.

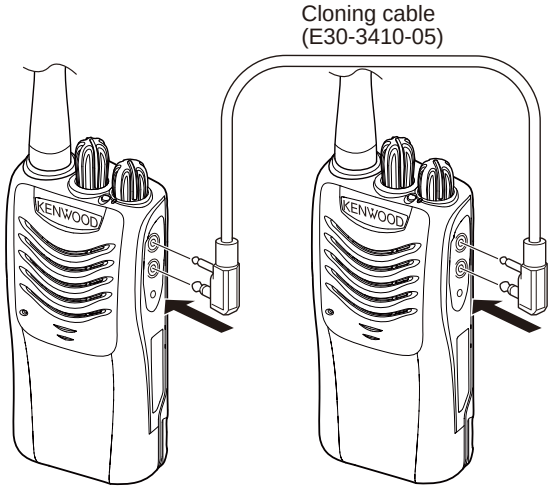
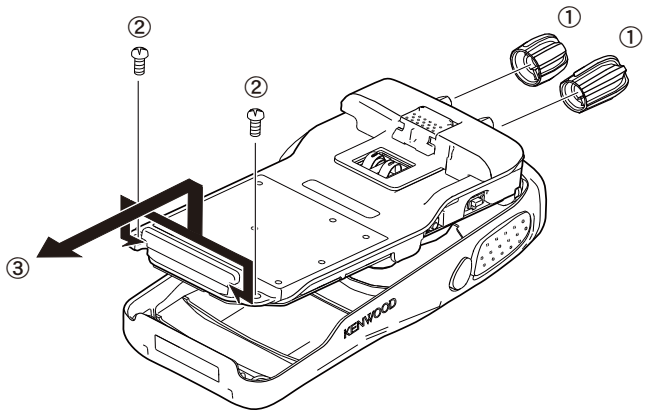


Fig. 2

DISASSEMBLY FOR REPAIR

1. Separating the Case Assembly from the Chassis

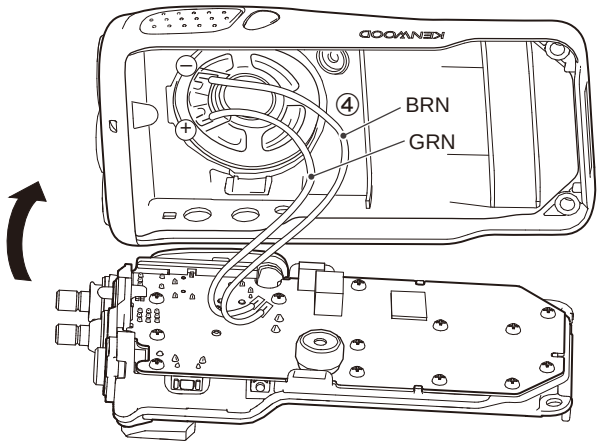
1. Remove the two knobs (①).
2. Remove the two screws (②).
3. Expand the right and left sides of the bottom of the case assembly, lift the chassis, and remove it from the case assembly (③).



4. Taking care not to cut the speaker lead (④), open the chassis and case assembly.

Note:

Solder the speaker wire back in its original position if you have removed it.

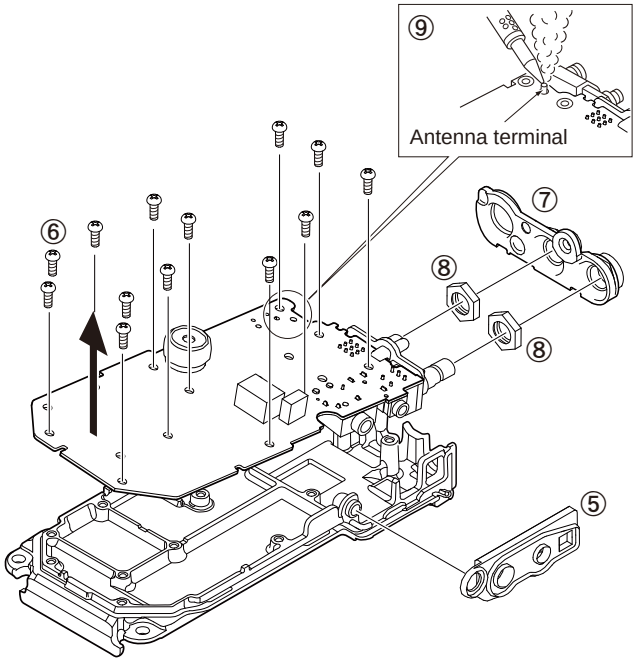


2. Removing the TX-RX unit from the Chassis

1. Remove the packing (⑤).
2. Remove the 13 screws (⑥).
3. Remove the packing (⑦) and two hexagon nuts (⑧).
4. Remove the solder from the antenna terminal using a soldering iron then lift the unit off (⑨).

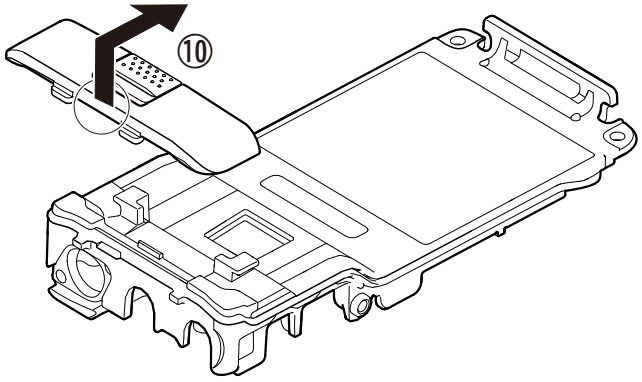
Note:

When reassembling the unit in the chassis, be sure to solder the antenna terminal.



3. Removing the Rear Panel

1. Raise the rear panel on the chassis (⑩).



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 is supplied from the PLL circuit.

The PLL circuit in the transmitter generates the necessary frequencies.

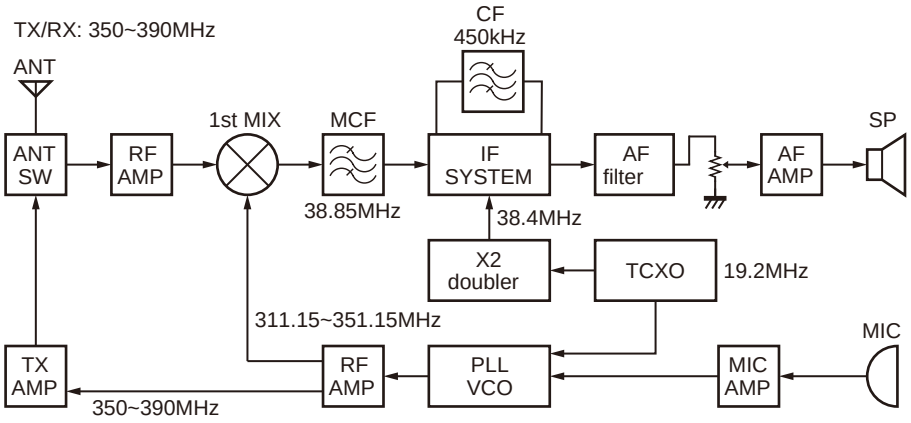


Fig. 1 Frequency configuration

2. Receiver System

The receiver system is shown in Figure 2.

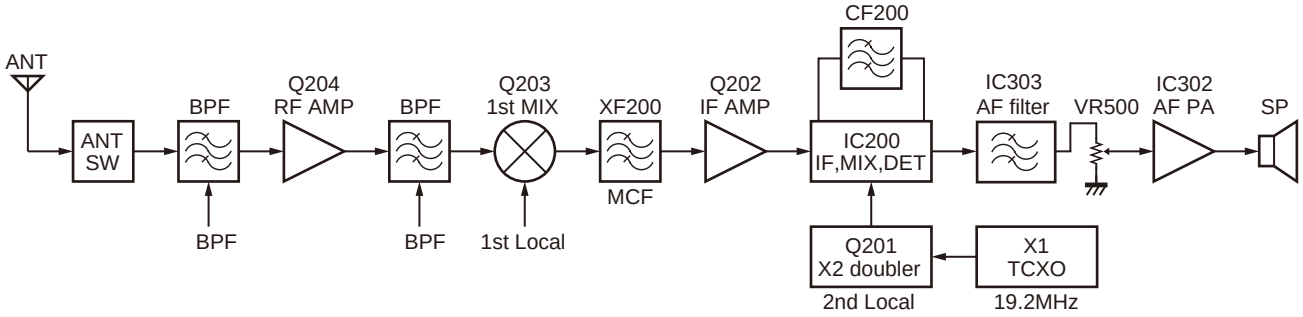


Fig. 2 Receiver system

2-1. Front End (RF Amplifier) Circuit

The signal coming from the antenna passes through the transmit/receive switching diode circuit (D101, D102, D103 and D105) and a BPF (L208 and L210), and is then amplified by the RF amplifier (Q204).

The resulting signal passes through a BPF (L215, L218 and L219) and goes to the mixer. These BPFs are adjusted by variable capacitors (D201 D202, and D204). The input voltage to the variable capacitor is a regulated voltage output from the DAC (IC300).

2-2. First Mixer

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

The resulting signal passes through the XF200 MCF to cut the adjacent spurious and provide the optimum characteristics, such as adjacent frequency selectivity.

CIRCUIT DESCRIPTION

2-3. IF Amplifier Circuit

The first IF signal is passed through a four-pole monolithic crystal filter (XF200) to remove the adjacent channel signal.

The filtered first IF signal is amplified by the first IF amplifier (Q202) and then applied to the IF system IC (IC200).

The IF system IC provides a second mixer, second local oscillator, limiting amplifier, quadrature detector and RSSI (Received Signal Strength Indicator).The second mixer mixes the first IF signal with the 38.4MHz of the second local oscillator output (TCXO X1) and produces the second IF signal of 450kHz.

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

2-4. Audio Amplifier Circuit

The demodulated signal from IC200 is amplified by IC305, IC303 and goes to AF amplifier through IC302.

The signal then goes through an volume control (VR500), and is routed to an audio power amplifier (IC302) where it is amplified and output to the speaker.

To output sounds from the speaker, IC400 sends a high signal to the SPMUT line and turns IC400 on through Q300, Q301, Q302 and Q306.

3. Transmitter System

3-1. Microphone Amplifier Circuit

The signal from microphone amplified by IC301 and goes through mute switch (IC300).

IC304 is composed of high-pass filter, low-pass filter and pre-emphasis/IDC circuit.

The output signal from the DAC IC (IC300) goes to the VCO modulation input.

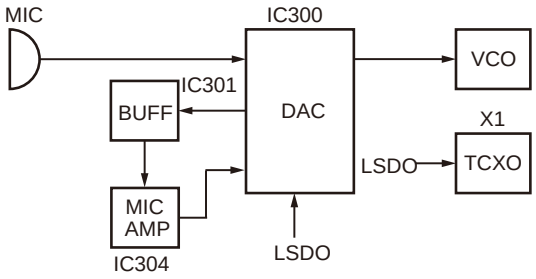


Fig. 3 Microphone amplifier circuit

3-2. Drive and Final Amplifier Circuit

The signal from the T/R switch (D100 is on) is amplified by the pre-drive amplifier (Q100) to 30mW.

The output of the pre-drive amplifier is amplified by the drive amplifier (Q101) and the RF final amplifier (Q102) to 4.0W (1W when the power is low).

The drive amplifier and the RF final amplifier consist of two MOS FET stages.

The output of the RF final amplifier is then passed through the harmonic filter (LPF) and antenna switch (D101 and D102) and is applied to the antenna terminal.

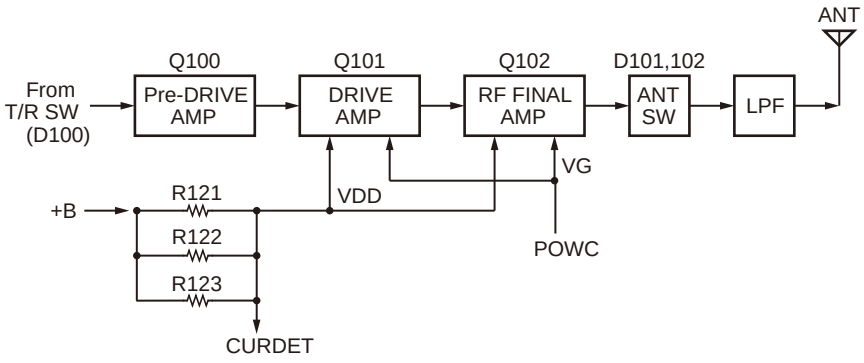


Fig. 4 Drive and final amplifier circuit

CIRCUIT DESCRIPTION

4. Frequency Synthesizer Circuit

4-1. Frequency Synthesizer

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

The TCXO generates 19.2MHz. The frequency stability is 2.5 ppm within the temperature range of –30 to +60°C.

The frequency tuning and modulation of the TCXO are done to apply a voltage to pin 1 of the TCXO. The output of the TCXO is applied to pin 1 of the PLL IC.

The VCO consists of 1VCO and covers a dual range of the 350.00~390.00MHz and the 311.15~351.15MHz. The VCO generates 311.15~351.15MHz for providing to the first local signal in receive.

The PLL IC consists of a prescaler, reference divider, phase comparator, charge pump (The frequency step of the PLL circuit is 5 or 6.25 kHz).

PLL data is output from DATA (pin 19), CLOCK (pin 18) and PLDL (pin 20) of the MCU (IC400). The data are input to the PLL IC when the channel is changed or when transmission is changed to reception and vice versa. A PLL lock condition is always monitored by the pin 22 (PLUL) of the MCU. When the PLL is unlocked, the PLUL goes low.

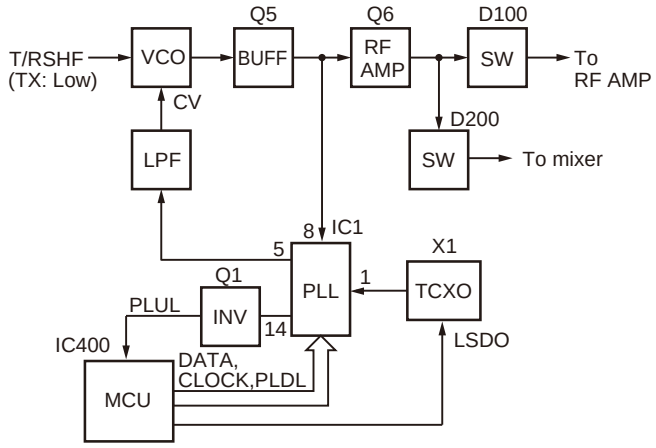


Fig. 5 PLL block diagram

5. Control Circuit

The control consists of the MCU (IC400) and its peripheral circuits. It controls the TX-RX unit. IC400 mainly performs the following;

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

Note:

The EEPROM stores tuning data (Deviation, Squelch, etc.).

Realign the transceiver after replacing the EEPROM.

6. Signaling Circuit

6-1. Encode

■ Low-speed data (QT, DQT)

Low-speed data is output from pin 49 (LSDO) of the MCU (IC400). The signal passes through a low-pass CR filter. The signal is mixed with the audio signal and goes to the VCO and TCXO (X1) modulation input after signal processing in the DAC IC (IC300).

■ High-speed data (DTMF)

High-speed data (HSD) is output from pin 50 (HSDO) of the MCU.

The signal passes through a low-pass CR filter. TX deviation making an adjustment by MCU is applied to the DAC IC (IC300). The signal is mixed with the audio signal and goes to the VCO and TCXO.

6-2. Decode

■ QT/DQT

The output signal from IF IC (IC200) enters the MCU (IC400) through IC300. IC400 determines whether the QT or DQT matches the preset value, and controls the SPMUT and the speaker output sounds according to the squelch results.

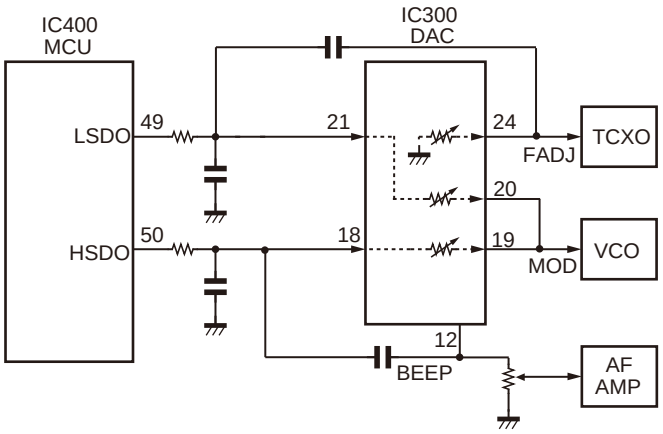


Fig. 6 Encode

7. Power Supply

There are five 5V power supplies for the MCU:

5M is always output while the power is on.

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

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

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

5MS is 5V for the SP/MIC connector and the DAC IC (IC300).

SEMICONDUCTOR DATA

MCU:F2136ACNKDRB (TX-RX unit IC400)

Pin No.	Signal Name	I/O	Function
1	NC	O	NC
2	VREF	-	Reference voltage input
3	MODE	I	Mode select for MCU
4	NC	O	NC
5	NC	O	NC
6	RESET	I	Reset signal input
7	XOUT	O	Oscillation circuit
8	Vss	-	GND
9	XIN	I	Oscillation circuit
10	Vcc	-	Power supply
11	BSFT	O	Beat shift for MCU clock
12	NC	O	NC
13	NC	O	NC
14	NC	O	NC
15	E2WP	O	Write protect for EEPROM
16	E2DAT	I/O	Data input/output from EEPROM
17	E2CLK	O	Clock for EEPROM
18	CLOCK	O	Clock for PLL/DAC IC
19	DATA	O	Data for PLL/DAC IC
20	PLDL	O	Load enable for PLL IC
21	PLPS	O	Power saving for PLL IC
22	PLUL	I	Lock detect signal from PLL IC
23	NC	O	NC
24	EN4	I	Encoder input 4
25	EN3	I	Encoder input 3
26	EN2	I	Encoder input 2
27	EN1	I	Encoder input 1
28	NC	O	NC
29	OPTDET	I	2pin option detection
30	LEDR	O	LED (red) control
31	LEDG	O	LED (green) control
32	SPMUT	O	Power switch for AF amp
33	NC	O	NC
34	5TC	O	5T control
35	5CC	O	5C control (SAVE)
36	5MSC	O	5MS control
37	DACLD	O	Load enable for DAC IC
38	PTT	I	PTT key input
39	PFKEY	I	PF key input
40	INT	I	INT signal input
41	VDCSW	O	Voltage discharge switch
42	WID/NAR	O	Wide/Narrow control
43	RXD	I	Serial data input (FPU)
44	TXD	O	Serial data output (FPU)
45	NC	O	NC
46	NC	O	NC
47	VOXIN	I	VOX level input
48	CVDET	I	VCO voltage detection
49	LSDO	O	Low speed data output
50	HSDO	O	DTMF/beep output
51	BATT	I	Battery voltage input
52	RSSI	I	RSSI input
53	SQL	I	Squelch input
54	LSDIN	I	LSD input
55	THDET	I	Thermistor input
56	CURDET	I	Current detection
57	T/RSHF	O	VCO Shift control
58	5VC	O	5V control
59	NC	O	NC
60	NC	O	NC
61	NC	O	NC
62	TYPE2	I	Destination selection 2
63	TYPE1	I	Destination selection 1
64	5RC	O	5R control

COMPONENTS DESCRIPTION

TX-RX unit (X57-8100-23)

Ref. No.	Part Name	Description
IC1	IC	PLL system
IC200	IC	FM IF system
IC300	IC	DAC
IC301	IC	LSD buffer
IC302	IC	AF power AMP
IC303	IC	AF filter
IC304	IC	MIC AMP
IC305	IC	QT/DQT filter
IC400	IC	MCU
IC401	IC	EEPROM
IC500	IC	Voltage detector/RESET
IC501	IC	Voltage regulator/5V
IC503	IC	Voltage regulator/5V
Q1	Transistor	DC switch
Q2	Transistor	TX/RX RF switch
Q3	Transistor	Ripple filter
Q4	FET	VCO
Q5	Transistor	RF buffer AMP
Q6	Transistor	RF AMP
Q7	Transistor	Voltage regulator/3V
Q100	Transistor	Pre drive AMP
Q101	FET	Drive AMP
Q102	FET	Final AMP
Q103	Transistor	Voltage discharge switch
Q200	Transistor	W/N switch
Q201	Transistor	Doubler
Q202	Transistor	IF AMP
Q203	FET	Mixer
Q204	FET	RF AMP
Q300	Transistor	DC switch
Q301	Transistor	DC switch
Q302	FET	Mute swtch
Q303	FET	DC switch
Q304	Transistor	DC switch
Q305	Transistor	W/N switch
Q306	FET	Mute switch
Q400	Transistor	Switch
Q401	Transistor	DC switch
Q402	Transistor	DC switch
Q500	FET	DC switch
Q501	FET	DC switch
Q502	Transistor	DC switch
D1	Diode	Current steering
D2	Variable capacitance diode	Frequency control/ VCO
D3	Variable capacitance diode	Frequency control/ VCO
D4	Diode	TX/RX RF switch
D5	Variable capacitance diode	Frequency control/ VCO
D6	Variable capacitance diode	Modulator /TX VCO
D7	Diode	Ripple filter
D8	Diode	Current steering
D100	Diode	TX/RX RF switch
D101	Diode	ANT switch
D102	Diode	ANT switch
D103	Diode	ANT switch
D105	Diode	ANT switch
D200	Diode	TX/RX RF switch
D201	Variable capacitance diode	RX BPF tuning
D202	Variable capacitance diode	RX BPF tuning
D204	Variable capacitance diode	RX BPF tuning
D260	Variable capacitance diode	RX BPF tuning
D261	Variable capacitance diode	RX BPF tuning
D301	Diode	Current steering
D400	LED	LED/green
D401	LED	LED/red
D402	Diode	VCO speed up
D500	Diode	Protect
D501	Diode	Current steering

PARTS LIST

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

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

TK-3000
TX-RX UNIT (X57-8100-23)

Ref. No.	Address	New parts	Parts No.	Description	Destination
			TK-3000		
1	1A		A02-4135-03	PLASTIC CABINET ASSY	
2	3A		A10-4150-21	CHASSIS	
3	3B		A82-0081-02	REAR PANEL	
4	2B		B11-1892-03	ILLUMINATION GUIDE	
6	3B		E04-0486-05	RF COAXIAL RECEPTACLE(SMA)	
7	2A		E23-1364-04	TERMINAL	
8	1B		E37-1539-05	PROCESSED LEAD WIRE(SP- BRN)	
9	1B		E37-1540-05	PROCESSED LEAD WIRE(SP+ GRN)	
10	2A		E72-0436-03	TERMINAL BLOCK	
11	3B		G01-4571-04	COIL SPRING	
			G10-1828-04	FIBROUS SHEET	
13	2A		G11-4437-04	SHEET(Q102-CHASSIS)	
14	3A		G13-2364-14	CUSHION(CHASSIS)	
15	3B		G13-2348-14	CUSHION(BATT-TERMINAL)	
16	2A	✻	G53-1867-13	PACKING(CHASSIS)	
18	1B	✻	G53-1868-12	PACKING(TOP)	
19	3B	✻	G53-1869-13	PACKING(JACK)	
20	1A	✻	G53-1871-14	PACKING(MIC)	
22	1B		K29-9487-03	KNOB(VOL)	
23	1B		K29-9488-03	KNOB(SELECTOR)	
24	1A	✻	K29-9489-13	KNOB(PTT)	
25	1A	✻	K29-9490-13	BUTTON KNOB(SIDE)	
26	3B		K29-9491-03	LEVER KNOB(BATTERY)	
A	2B		N09-2438-05	BINDING HEAD SCREW	
B	3A		N30-2606-48	PAN HEAD MACHINE SCREW	
C	1A,2A		N83-2005-48	PAN HEAD TAPTITE SCREW	
28	1B		T07-0787-05	SPEAKER	
				ACCESSORY	
			B09-0744-03	CAP(SP/MIC) ACCESSORY	
			B62-2299-00	INSTRUCTION MANUAL ACCESSORY	
			J29-0751-05	BELT CLIP ACCESSORY	
			N35-3005-43	BINDING HEAD SCREW ACCESSORY	
			T90-1098-05	HELICAL ANTENNA ACCESSORY	
			W08-1246-05	AC ADAPTER ACCESSORY	
			W08-1249-15	CHARGER ACCESSORY	
		✻	W09-1073-15	BATTERY ASSY ACCESSORY	
		✻	X57-8100-24	TX-RX UNIT (FOR SERVICE)	

Ref. No.	Address	New parts	Parts No.	Description		Destination
				TX-RX UNIT (X57-8100-23)		
D400			B30-1782-05	LED(GREEN)		
D401			B30-1779-05	LED(RED)		
C1			CS77CA1ER47M	CHIP TNTL 0.47UF	25WV	
C2			CK73HB1H102K	CHIP C 1000PF	K	
C3			CK73HB1A104K	CHIP C 0.10UF	K	
C4			CS77CA1C100M	CHIP TNTL 10UF	16WV	
C5			CS77CA1E010M	CHIP TNTL 1.0UF	25WV	
C7			CC73HCH1H220G	CHIP C 22PF	G	
C8			CK73HB1A104K	CHIP C 0.10UF	K	
C9			CC73HCH1H030B	CHIP C 3.0PF	B	
C10 ,11			CK73HB1A105K	CHIP C 1.0UF	K	
C12			CC73HCH1H680G	CHIP C 68PF	G	
C13			CS77CP0J010M	CHIP TNTL 1.0UF	6.3WV	
C14 ,15			CK73HB1C103K	CHIP C 0.010UF	K	
C16			CK73HB1H102K	CHIP C 1000PF	K	
C17			CC73HCH1H040B	CHIP C 4.0PF	B	
C19			CK73HB1H102K	CHIP C 1000PF	K	
C20			CS77CA1A220M	CHIP TNTL 22UF	10WV	
C21 ,22			CC73GCH1HR75B	CHIP C 0.75PF	B	
C23 ,24			CK73HB1H102K	CHIP C 1000PF	K	
C25			CC73HCH1H050B	CHIP C 5.0PF	B	
C26			CK73HB1H102K	CHIP C 1000PF	K	
C27			CC73HCH1H220J	CHIP C 22PF	J	
C28			CK73HB1H102K	CHIP C 1000PF	K	
C29			CC73GCH1H0R5B	CHIP C 0.5PF	B	
C30			CK73HB1H102K	CHIP C 1000PF	K	
C31			CK73HB1C103K	CHIP C 0.010UF	K	
C32			CK73HB1H102K	CHIP C 1000PF	K	
C33			CC73HCH1H330J	CHIP C 33PF	J	
C34			CK73HB1H102K	CHIP C 1000PF	K	
C35			CC73HCH1H060B	CHIP C 6.0PF	B	
C36			CC73HCH1H040B	CHIP C 4.0PF	B	
C37			CC73HCH1H060B	CHIP C 6.0PF	B	
C38			CC73GCH1H220J	CHIP C 22PF	J	
C39			CC73HCH1H150G	CHIP C 15PF	G	
C40 ,41			CK73HB1H102K	CHIP C 1000PF	K	
C42			CC73HCH1H040B	CHIP C 4.0PF	B	
C43			CK73HB1H102K	CHIP C 1000PF	K	
C54			CC73HCH1H040B	CHIP C 4.0PF	B	
C100			CC73HCH1H100B	CHIP C 10PF	B	
C101			CC73HCH1H271J	CHIP C 270PF	J	
C102			CC73HCH1H220J	CHIP C 22PF	J	
C103,104			CC73HCH1H271J	CHIP C 270PF	J	
C105			CK73HB1A104K	CHIP C 0.10UF	K	
C107			CC73HCH1H271J	CHIP C 270PF	J	
C108			CC73HCH1H120J	CHIP C 12PF	J	
C109			CC73HCH1H090B	CHIP C 9.0PF	B	
C110,111			CC73HCH1H271J	CHIP C 270PF	J	
C112			CC73HCH1H221J	CHIP C 220PF	J	
C113,114			CC73HCH1H271J	CHIP C 270PF	J	
C116			CK73HB1C103K	CHIP C 0.010UF	K	
C117			CK73FB1A225K	CHIP C 2.2UF	K	
C119,120			CC73HCH1H271J	CHIP C 270PF	J	

PARTS LIST

TX-RX UNIT (X57-8100-23)

Ref. No.	Address	New parts	Parts No.	Description			Destination
C124			CC73HCH1H271J	CHIP C	270PF	J	
C127			CC73GCH1H181J	CHIP C	180PF	J	
C128			CC73GCH1H0R5B	CHIP C	0.5PF	B	
C129			CC73HCH1H271J	CHIP C	270PF	J	
C130			CC73GCH1H090B	CHIP C	9.0PF	B	
C131			CC73GCH1H820J	CHIP C	82PF	J	
C132			CC73GCH1H060B	CHIP C	6.0PF	B	
C133			CC73HCH1H070B	CHIP C	7.0PF	B	
C134			CC73HCH1H271J	CHIP C	270PF	J	
C135			CC73GCH1H030B	CHIP C	3.0PF	B	
C136			CC73GCH1H150J	CHIP C	15PF	J	
C137			CC73GCH1H3R5B	CHIP C	3.5PF	B	
C138			CC73GCH1H090B	CHIP C	9.0PF	B	
C139			CK73FB1A475K	CHIP C	4.7UF	K	
C145			CC73HCH1H271J	CHIP C	270PF	J	
C146			CC73HCH1H1R5B	CHIP C	1.5PF	B	
C150			CC73HCH1H020C	CHIP C	2.0PF	C	
C153			CC73HCH1H390J	CHIP C	39PF	J	
C158,159			CC73HCH1H271J	CHIP C	270PF	J	
C173			CC73GCH1H560J	CHIP C	56PF	J	
C174			CC73GCH1H120J	CHIP C	12PF	J	
C175			CC73GCH1H330J	CHIP C	33PF	J	
C179			CC73GCH1H220J	CHIP C	22PF	J	
C182			CC73GCH1H220J	CHIP C	22PF	J	
C183			CC73GCH1H150J	CHIP C	15PF	J	
C185			CC73GCH1H120J	CHIP C	12PF	J	
C187			CC73GCH1H090B	CHIP C	9.0PF	B	
C200			CK73FB1A106K	CHIP C	10UF	K	
C201			CK73HB1H102K	CHIP C	1000PF	K	
C202			CK73HB1C103K	CHIP C	0.010UF	K	
C203			CC73HCH1H101J	CHIP C	100PF	J	
C204			CK73HB1E223K	CHIP C	0.022UF	K	
C205			CK73HB1A104K	CHIP C	0.10UF	K	
C206,207			CC73HCH1H221J	CHIP C	220PF	J	
C208			CK73HB1A104K	CHIP C	0.10UF	K	
C209			CC73HCH1H220J	CHIP C	22PF	J	
C210			CK73HB1A104K	CHIP C	0.10UF	K	
C211			CK73HB1C333K	CHIP C	0.033UF	K	
C212,213			CK73HB1A104K	CHIP C	0.10UF	K	
C214			CK73HB1C103K	CHIP C	0.010UF	K	
C215			CC73HCH1H220J	CHIP C	22PF	J	
C216			CK73HB1C103K	CHIP C	0.010UF	K	
C217			CC73HCH1H050C	CHIP C	5.0PF	C	
C218			CK73HB1C103K	CHIP C	0.010UF	K	
C219			CC73HCH1H220J	CHIP C	22PF	J	
C220			CK73HB1H102K	CHIP C	1000PF	K	
C221			CK73HB1C103K	CHIP C	0.010UF	K	
C222			CC73HCH1H080D	CHIP C	8.0PF	D	
C223			CC73HCH1H080B	CHIP C	8.0PF	B	
C224			CK73HB1C103K	CHIP C	0.010UF	K	
C225			CC73HCH1H050B	CHIP C	5.0PF	B	
C226			CK73HB1H471K	CHIP C	470PF	K	
C227			CK73HB1C103K	CHIP C	0.010UF	K	
C228			CC73HCH1H030B	CHIP C	3.0PF	B	
C230			CC73HCH1H050B	CHIP C	5.0PF	B	
C233			CC73HCH1H040B	CHIP C	4.0PF	B	
C236			CC73HCH1H100B	CHIP C	10PF	B	
C237			CC73HCH1H120J	CHIP C	12PF	J	
C238			CC73HCH1H040B	CHIP C	4.0PF	B	
C239			CC73HCH1HR75B	CHIP C	0.75PF	B	

Ref. No.	Address	New parts	Parts No.	Description			Destination
C240-242			CK73HB1H471K	CHIP C	470PF	K	
C243			CK73HB1A104K	CHIP C	0.10UF	K	
C244			CK73HB1H471K	CHIP C	470PF	K	
C245			CC73HCH1H020B	CHIP C	2.0PF	B	
C247			CC73HCH1HR75B	CHIP C	0.75PF	B	
C248			CK73HB1A104K	CHIP C	0.10UF	K	
C250			CK73HB1H471K	CHIP C	470PF	K	
C252			CC73HCH1H010B	CHIP C	1.0PF	B	
C253			CC73HCH1H100B	CHIP C	10PF	B	
C254			CC73HCH1H1R5B	CHIP C	1.5PF	B	
C255			CK73HB1A104K	CHIP C	0.10UF	K	
C256			CK73HB1H471K	CHIP C	470PF	K	
C257			CC73HCH1H030B	CHIP C	3.0PF	B	
C258			CK73HB1H102K	CHIP C	1000PF	K	
C259			CK73HB1C103K	CHIP C	0.010UF	K	
C262			CK73HB1H471K	CHIP C	470PF	K	
C263			CC73HCH1H180J	CHIP C	18PF	J	
C268,269			CC73HCH1H100B	CHIP C	10PF	B	
C270			CC73HCH1H1R5B	CHIP C	1.5PF	B	
C271			CC73HCH1H020B	CHIP C	2.0PF	B	
C274			CK73HB1H471K	CHIP C	470PF	K	
C275			CK73HB1C103K	CHIP C	0.010UF	K	
C276			CK73HB1H471K	CHIP C	470PF	K	
C277			CK73HB1A104K	CHIP C	0.10UF	K	
C300,301			CK73HB1H102K	CHIP C	1000PF	K	
C302			C92-0953-05	ELECTRO	100UF	6.3WV	
C303			CK73HB1C473K	CHIP C	0.047UF	K	
C304			CK73FB1A106K	CHIP C	10UF	K	
C305			CK73HB1C103K	CHIP C	0.010UF	K	
C306			CK73HB1A224K	CHIP C	0.22UF	K	
C308			CK73GB1E105K	CHIP C	1.0UF	K	
C309			CK73HB1A104K	CHIP C	0.10UF	K	
C310			CK73HB1C473K	CHIP C	0.047UF	K	
C311			CK73HB1A105K	CHIP C	1.0UF	K	
C312			CK73HB1C473K	CHIP C	0.047UF	K	
C313			CK73HB1A104K	CHIP C	0.10UF	K	
C314			CC73HCH1H101J	CHIP C	100PF	J	
C315			CK73FB1A106K	CHIP C	10UF	K	
C316			CK73HB1A104K	CHIP C	0.10UF	K	
C317			CK73HB1C103K	CHIP C	0.010UF	K	
C318			CC73HCH1H221J	CHIP C	220PF	J	
C319			CK73HB1C103K	CHIP C	0.010UF	K	
C320			CK73GB1E104K	CHIP C	0.10UF	K	
C321			CK73HB1C103K	CHIP C	0.010UF	K	
C322			CC73HCH1H271J	CHIP C	270PF	J	
C323			CK73HB1A104K	CHIP C	0.10UF	K	
C324			CK73HB1A184K	CHIP C	0.18UF	K	
C326			CK73HB1H822K	CHIP C	8200PF	K	
C328			CK73HB1A394K	CHIP C	0.39UF	K	
C329			CK73HB1C333K	CHIP C	0.033UF	K	
C330			CK73HB1H561K	CHIP C	560PF	K	
C332			CK73HB1C103K	CHIP C	0.010UF	K	
C333			CK73HB1H102K	CHIP C	1000PF	K	
C334,335			CK73HB1A184K	CHIP C	0.18UF	K	
C336			CK73HB1C103K	CHIP C	0.010UF	K	
C337			CK73HB1A184K	CHIP C	0.18UF	K	
C338			CC73HCH1H331J	CHIP C	330PF	J	
C339			CK73HB1A104K	CHIP C	0.10UF	K	
C340			CC73HCH1H100B	CHIP C	10PF	B	
C341			CK73HB1H222K	CHIP C	2200PF	K	

PARTS LIST

TX-RX UNIT (X57-8100-23)

Ref. No.	Address	New parts	Parts No.	Description	Destination
C342			CK73HB1C103K	CHIP C 0.010UF K	
C343			CK73HB1A184K	CHIP C 0.18UF K	
C344			CK73HB1C273K	CHIP C 0.027UF K	
C345			CK73HB1H102K	CHIP C 1000PF K	
C346			CK73HB1A184K	CHIP C 0.18UF K	
C347			CK73GB1A105K	CHIP C 1.0UF K	
C349			CK73HB1C333K	CHIP C 0.033UF K	
C350			CK73HB1H102K	CHIP C 1000PF K	
C352			CK73HB1H102K	CHIP C 1000PF K	
C353			CK73GB1E105K	CHIP C 1.0UF K	
C354			CK73HB1A224K	CHIP C 0.22UF K	
C355			CK73HB1A105K	CHIP C 1.0UF K	
C357,358			CK73HB1A104K	CHIP C 0.10UF K	
C360			CK73HB1A104K	CHIP C 0.10UF K	
C397			CC73HCH1H271J	CHIP C 270PF J	
C400			CK73HB1A104K	CHIP C 0.10UF K	
C401			CK73HB1H102K	CHIP C 1000PF K	
C402			CC73HCH1H120J	CHIP C 12PF J	
C403			CC73HCH1H010B	CHIP C 1.0PF B	
C404			CK73HB1A104K	CHIP C 0.10UF K	
C405			CK73HB1H102K	CHIP C 1000PF K	
C406			CC73HCH1H120J	CHIP C 12PF J	
C407			CK73HB1H102K	CHIP C 1000PF K	
C408			CK73HB1C103K	CHIP C 0.010UF K	
C409			CK73HB1H102K	CHIP C 1000PF K	
C411-415			CK73HB1H102K	CHIP C 1000PF K	
C500			CC73HCH1H101J	CHIP C 100PF J	
C501,502			CK73HB1H102K	CHIP C 1000PF K	
C503			CK73FB1A475K	CHIP C 4.7UF K	
C504			CK73HB1H102K	CHIP C 1000PF K	
C505			CK73GB1E105K	CHIP C 1.0UF K	
C506			CK73HB1H102K	CHIP C 1000PF K	
C507			CK73FB1A106K	CHIP C 10UF K	
C511			CK73HB1H102K	CHIP C 1000PF K	
C513,514			CK73GB1E105K	CHIP C 1.0UF K	
C515,516			CC73HCH1H271J	CHIP C 270PF J	
C517			CK73FB1A475K	CHIP C 4.7UF K	
C522-524			CC73HCH1H271J	CHIP C 270PF J	
C525			CK73HB1H102K	CHIP C 1000PF K	
CN103			E23-1167-05	TERMINAL	
J300	2B		E11-0484-05	3.5D PHONE JACK(MIC)	
J301	2B		E11-0717-05	2.5D PHONE JACK(SP)	
F101			F53-0287-05	FUSE(0.5A)	
F300			F53-0467-05	FUSE(0.315A)	
F500			F53-0372-05	FUSE(3.15A)	
101	2A		J30-1308-04	SPACER(MIC300)	
CF200	2A		L72-1046-05	CERAMIC FILTER(450KHZ)	
CD200	2A		L79-1914-05	CERAMIC DISCRIMINATOR	
L1			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	
L2			L41-1078-14	SMALL FIXED INDUCTOR(10NH)	
L3			L41-2778-14	SMALL FIXED INDUCTOR(27NH)	
L4 -6			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	
L7			L40-2775-71	SMALL FIXED INDUCTOR(27NH)	
L8			L40-1575-71	SMALL FIXED INDUCTOR(15NH)	
L9			L40-4775-71	SMALL FIXED INDUCTOR(47NH)	
L10			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	
L12			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	
L100			L40-1575-71	SMALL FIXED INDUCTOR(15NH)	

Ref. No.	Address	New parts	Parts No.	Description	Destination
L101			L40-3375-71	SMALL FIXED INDUCTOR(33NH)	
L102			L40-1275-71	SMALL FIXED INDUCTOR(12NH)	
L103			L41-3375-53	SMALL FIXED INDUCTOR(33NH)	
L104			L34-4572-05	AIR-CORE COIL	
L108			L34-4571-05	AIR-CORE COIL	
L109			L41-2285-43	SMALL FIXED INDUCTOR(220NH)	
L110			L34-4573-05	AIR-CORE COIL	
L111,112			L34-4572-05	AIR-CORE COIL	
L113			L41-1575-53	SMALL FIXED INDUCTOR(15NH)	
L204			L41-5685-39	SMALL FIXED INDUCTOR(0.56UH)	
L205			L40-1875-71	SMALL FIXED INDUCTOR(18NH)	
L208			L41-1578-14	SMALL FIXED INDUCTOR(15NH)	
L210			L41-1578-14	SMALL FIXED INDUCTOR(15NH)	
L211			L40-5681-86	SMALL FIXED INDUCTOR(0.56UH)	
L212			L40-8281-86	SMALL FIXED INDUCTOR(0.82UH)	
L213			L40-5681-86	SMALL FIXED INDUCTOR(0.56UH)	
L214			L40-3975-71	SMALL FIXED INDUCTOR(39NH)	
L215			L41-1578-14	SMALL FIXED INDUCTOR(15NH)	
L216			L40-1885-92	SMALL FIXED INDUCTOR(180NH)	
L217			L41-2785-45	SMALL FIXED INDUCTOR(270NH)	
L218,219			L41-1578-14	SMALL FIXED INDUCTOR(15NH)	
X1			L77-3074-05	TCXO(19.2MHZ)	
X400			L77-2974-05	CRYSTAL RESONATOR(11.0592MHZ)	
XF200			L71-0669-05	MCF(38.85MHZ)	
R1			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R2			RK73HB1J103J	CHIP R 10K J 1/16W	
R3			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R5			RK73HB1J821J	CHIP R 820 J 1/16W	
R7			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R9			RK73HB1J103J	CHIP R 10K J 1/16W	
R11			RK73HB1J104J	CHIP R 100K J 1/16W	
R12			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R13			RK73HB1J104J	CHIP R 100K J 1/16W	
R14			RK73HB1J103J	CHIP R 10K J 1/16W	
R15			RK73HB1J104J	CHIP R 100K J 1/16W	
R16 ,17			RK73HB1J103J	CHIP R 10K J 1/16W	
R18			RK73HB1J223J	CHIP R 22K J 1/16W	
R19 -22			RK73HB1J103J	CHIP R 10K J 1/16W	
R25			RK73HB1J100J	CHIP R 10 J 1/16W	
R26			RK73HB1J392J	CHIP R 3.9K J 1/16W	
R27			RK73HB1J221J	CHIP R 220 J 1/16W	
R28			RK73HB1J680J	CHIP R 68 J 1/16W	
R29			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R30			RK73HB1J470J	CHIP R 47 J 1/16W	
R32			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R33			RK73HB1J473J	CHIP R 47K J 1/16W	
R34			RK73HB1J100J	CHIP R 10 J 1/16W	
R37			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R38			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R39			RK73HB1J271J	CHIP R 270 J 1/16W	
R40			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R41			RK73HB1J100J	CHIP R 10 J 1/16W	
R42			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R43			RK73HB1J103J	CHIP R 10K J 1/16W	
R45			RK73HB1J000J	CHIP R 0 J 1/16W	
R50			RK73HB1J104J	CHIP R 100K J 1/16W	
R51			RK73HB1J333J	CHIP R 33K J 1/16W	
R100			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R101			RK73HB1J102J	CHIP R 1.0K J 1/16W	

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

PARTS LIST

TX-RX UNIT (X57-8100-23)

Ref. No.	Address	New parts	Parts No.	Description				Destination
R102			RK73HB1J222J	CHIP R	2.2K	J	1/16W	
R103			RK73HB1J150J	CHIP R	15	J	1/16W	
R104			RK73HB1J222J	CHIP R	2.2K	J	1/16W	
R105			RK73HB1J100J	CHIP R	10	J	1/16W	
R106			RK73HB1J473J	CHIP R	47K	J	1/16W	
R107			RK73HB1J270J	CHIP R	27	J	1/16W	
R108			RK73HB1J683J	CHIP R	68K	J	1/16W	
R109			RK73HB1J470J	CHIP R	47	J	1/16W	
R111			RK73HB1J683J	CHIP R	68K	J	1/16W	
R112			RK73HB1J390J	CHIP R	39	J	1/16W	
R113			RK73HB1J473J	CHIP R	47K	J	1/16W	
R114			RK73GB2A000J	CHIP R	0	J	1/10W	
R115			RK73FB2B000J	CHIP R	0	J	1/8W	
R116			RK73HB1J393J	CHIP R	39K	J	1/16W	
R117			RK73HB1J271J	CHIP R	270	J	1/16W	
R119			RK73HB1J271J	CHIP R	270	J	1/16W	
R120			RK73HB1J331J	CHIP R	330	J	1/16W	
R121-123			RK73EB2ER39K	CHIP R	0.39	K	1/4W	
R136			RK73HB1J182J	CHIP R	1.8K	J	1/16W	
R155			RK73HB1J150J	CHIP R	15	J	1/16W	
R156,157			RK73HB1J000J	CHIP R	0	J	1/16W	
R200			RK73HB1J103J	CHIP R	10K	J	1/16W	
R201			RK73HB1J470J	CHIP R	47	J	1/16W	
R202			RK73HB1J272J	CHIP R	2.7K	J	1/16W	
R203			RK73HB1J393J	CHIP R	39K	J	1/16W	
R204			RK73HB1J271J	CHIP R	270	J	1/16W	
R205			RK73HB1J682J	CHIP R	6.8K	J	1/16W	
R206			RK73HB1J274J	CHIP R	270K	J	1/16W	
R207			RK73HB1J562J	CHIP R	5.6K	J	1/16W	
R208			RK73HB1J101J	CHIP R	100	J	1/16W	
R209			RK73HB1J470J	CHIP R	47	J	1/16W	
R210			RK73HB1J334J	CHIP R	330K	J	1/16W	
R212			RK73HB1J184J	CHIP R	180K	J	1/16W	
R213			RK73HB1J222J	CHIP R	2.2K	J	1/16W	
R214			RK73HB1J561J	CHIP R	560	J	1/16W	
R215			RK73HB1J331J	CHIP R	330	J	1/16W	
R217			RK73HB1J222J	CHIP R	2.2K	J	1/16W	
R218			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R220			RK73HB1J104J	CHIP R	100K	J	1/16W	
R221			RK73HB1J823J	CHIP R	82K	J	1/16W	
R222			RK73HB1J104J	CHIP R	100K	J	1/16W	
R223			RK73HB1J000J	CHIP R	0	J	1/16W	
R224			RK73HB1J563J	CHIP R	56K	J	1/16W	
R226,227			RK73HB1J474J	CHIP R	470K	J	1/16W	
R229			RK73HB1J474J	CHIP R	470K	J	1/16W	
R230			RK73HB1J820J	CHIP R	82	J	1/16W	
R231			RK73HB1J271J	CHIP R	270	J	1/16W	
R232,233			RK73HB1J104J	CHIP R	100K	J	1/16W	
R237,238			RK73HB1J474J	CHIP R	470K	J	1/16W	
R239			RK73HB1J151J	CHIP R	150	J	1/16W	
R240			RK73HB1J683J	CHIP R	68K	J	1/16W	
R241,242			RK73HB1J470J	CHIP R	47	J	1/16W	
R243,244			RK73HB1J000J	CHIP R	0	J	1/16W	
R258			RK73HB1J181J	CHIP R	180	J	1/16W	
R267			RK73HB1J000J	CHIP R	0	J	1/16W	
R300			RK73HB1J152J	CHIP R	1.5K	J	1/16W	
R301			RK73HB1J101J	CHIP R	100	J	1/16W	
R302			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R303			RK73HB1J471J	CHIP R	470	J	1/16W	
R304			RK73HB1J473J	CHIP R	47K	J	1/16W	

Ref. No.	Address	New parts	Parts No.	Description				Destination
R305-308			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R309			RK73HB1J182J	CHIP R	1.8K	J	1/16W	
R310,311			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R312,313			RK73HB1J222J	CHIP R	2.2K	J	1/16W	
R314			RK73HB1J392J	CHIP R	3.9K	J	1/16W	
R315			RK73HB1J103J	CHIP R	10K	J	1/16W	
R316			RK73HB1J000J	CHIP R	0	J	1/16W	
R317			RK73HB1J334J	CHIP R	330K	J	1/16W	
R318			RK73HB1J274J	CHIP R	270K	J	1/16W	
R321			RK73HB1J474J	CHIP R	470K	J	1/16W	
R322			RK73HB1J105J	CHIP R	1.0M	J	1/16W	
R323			RK73HB1J562J	CHIP R	5.6K	J	1/16W	
R324,325			RK73HH1J473D	CHIP R	47K	D	1/16W	
R326			RK73HB1J000J	CHIP R	0	J	1/16W	
R327			RK73HB1J824J	CHIP R	820K	J	1/16W	
R328			RK73HB1J684J	CHIP R	680K	J	1/16W	
R329,330			RK73HB1J103J	CHIP R	10K	J	1/16W	
R332			RK73HB1J272J	CHIP R	2.7K	J	1/16W	
R334			RK73HB1J103J	CHIP R	10K	J	1/16W	
R335			RK73HB1J000J	CHIP R	0	J	1/16W	
R336			RK73HB1J823J	CHIP R	82K	J	1/16W	
R337			RK73HB1J000J	CHIP R	0	J	1/16W	
R340			RK73HB1J103J	CHIP R	10K	J	1/16W	
R342			RK73HB1J153J	CHIP R	15K	J	1/16W	
R344			RK73HB1J103J	CHIP R	10K	J	1/16W	
R345			RK73HB1J000J	CHIP R	0	J	1/16W	
R347			RK73HB1J103J	CHIP R	10K	J	1/16W	
R348			RK73HB1J563J	CHIP R	56K	J	1/16W	
R350			RK73HB1J471J	CHIP R	470	J	1/16W	
R351			RK73HB1J181J	CHIP R	180	J	1/16W	
R352			RK73HB1J104J	CHIP R	100K	J	1/16W	
R353			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R354			RK73HB1J334J	CHIP R	330K	J	1/16W	
R355			RK73HB1J473J	CHIP R	47K	J	1/16W	
R356			RK73HB1J183J	CHIP R	18K	J	1/16W	
R357			RK73HB1J564J	CHIP R	560K	J	1/16W	
R358			RK73HB1J473J	CHIP R	47K	J	1/16W	
R360			RK73HB1J184J	CHIP R	180K	J	1/16W	
R361			RK73HB1J821J	CHIP R	820	J	1/16W	
R363			RK73HB1J562J	CHIP R	5.6K	J	1/16W	
R364			RK73HB1J471J	CHIP R	470	J	1/16W	
R365			RK73HB1J000J	CHIP R	0	J	1/16W	
R366			RK73HB1J104J	CHIP R	100K	J	1/16W	
R367			RK73HB1J473J	CHIP R	47K	J	1/16W	
R369			RK73HB1J103J	CHIP R	10K	J	1/16W	
R370			RK73HH1J473D	CHIP R	47K	D	1/16W	
R371			RK73HB1J472J	CHIP R	4.7K	J	1/16W	
R372			RK73HH1J473D	CHIP R	47K	D	1/16W	
R373			RK73HB1J000J	CHIP R	0	J	1/16W	
R374			RK73HH1J473D	CHIP R	47K	D	1/16W	
R375			RK73HB1J103J	CHIP R	10K	J	1/16W	
R376			RK73HH1J473D	CHIP R	47K	D	1/16W	
R377			RK73HB1J393J	CHIP R	39K	J	1/16W	
R378			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R379			RK73HB1J104J	CHIP R	100K	J	1/16W	
R386			RK73HB1J392J	CHIP R	3.9K	J	1/16W	
R388			RK73HB1J472J	CHIP R	4.7K	J	1/16W	
R389			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R390			RK73HB1J000J	CHIP R	0	J	1/16W	
R392,393			RK73HB1J102J	CHIP R	1.0K	J	1/16W	

PARTS LIST

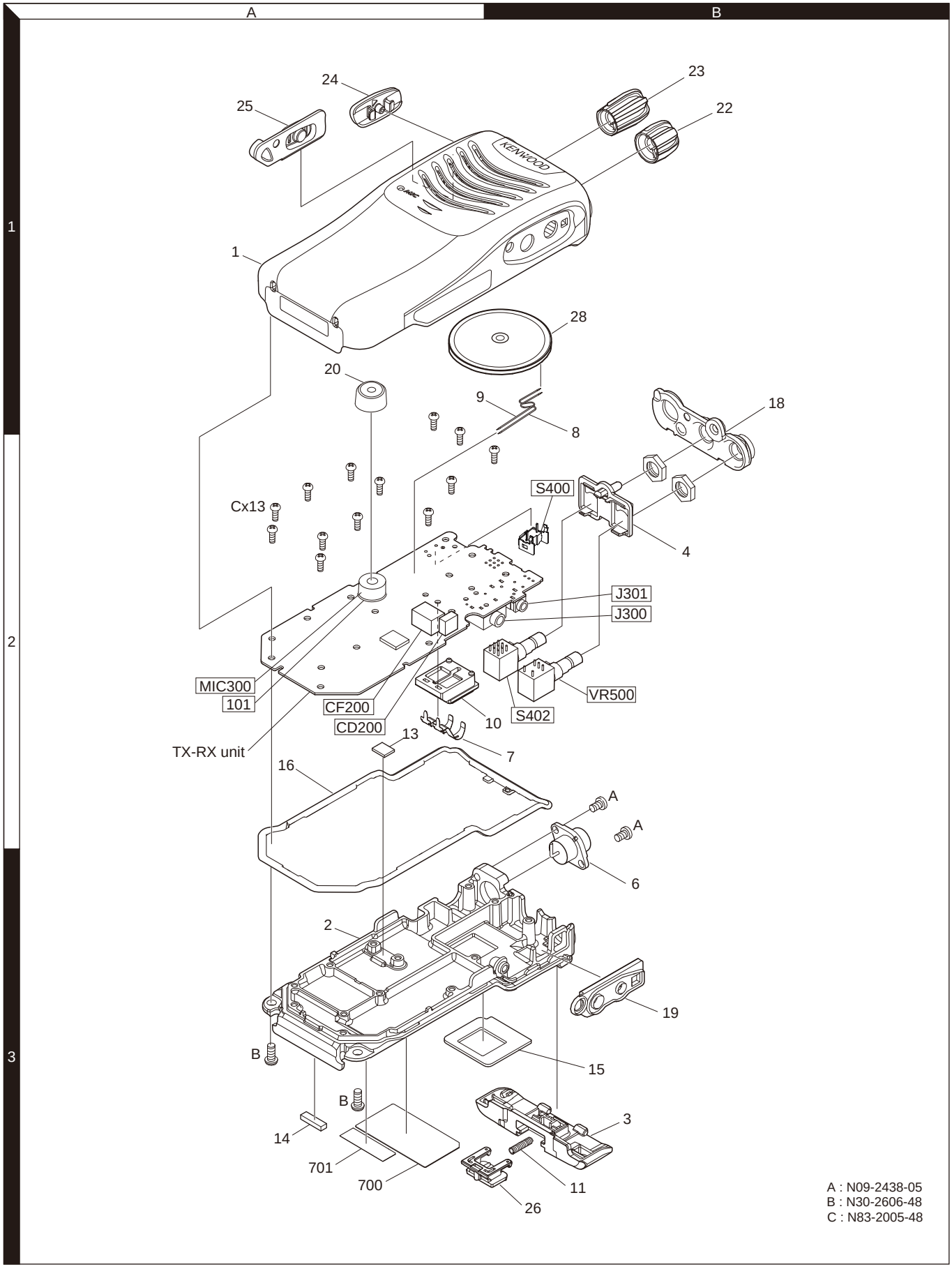
TX-RX UNIT (X57-8100-23)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R400			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R401			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R406			RK73HB1J101J	CHIP R 100 J 1/16W	
R407			RK73HB1J473J	CHIP R 47K J 1/16W	
R408			RK73HB1J101J	CHIP R 100 J 1/16W	
R409,410			RK73GB2A221J	CHIP R 220 J 1/10W	
R411,412			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R413			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R414			RK73HB1J474J	CHIP R 470K J 1/16W	
R438			RK73HB1J473J	CHIP R 47K J 1/16W	
R455			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R470			RK73HB1J103J	CHIP R 10K J 1/16W	
R473			RK73HB1J000J	CHIP R 0 J 1/16W	
R502			RK73HB1J334J	CHIP R 330K J 1/16W	
R505			RK73HB1J473J	CHIP R 47K J 1/16W	
R508			RK73HB1J473J	CHIP R 47K J 1/16W	
R509			RK73HB1J104J	CHIP R 100K J 1/16W	
R511			RK73HB1J334J	CHIP R 330K J 1/16W	
VR500	2B		R31-0684-05	VARIABLE RESISTOR	
S400	2B		S70-0414-05	TACT SWITCH(PTT)	
S401			S70-0514-05	TACT SWITCH	
S402	2B		S60-0447-05	ROTARY SWITCH(SELECTOR)	
MIC300	2A		T91-0674-05	MIC ELEMENT	
D1			DA2S101	DIODE	
D2 ,3			1SV325F	VARIABLE CAPACITANCE DIODE	
D4			HSC277	DIODE	
D5 ,6			HVC350B	VARIABLE CAPACITANCE DIODE	
D7 ,8			DA2S101	DIODE	
D100			HSC277	DIODE	
D101-103			HVC131	DIODE	
D105			HVC131	DIODE	
D200			HSC277	DIODE	
D201,202			HVC350B	VARIABLE CAPACITANCE DIODE	
D204			HVC350B	VARIABLE CAPACITANCE DIODE	
D260,261			HVC350B	VARIABLE CAPACITANCE DIODE	
D301			KDR731	DIODE	
D402			DA2S101	DIODE	
D500			GN1G	DIODE	
D501			RB521S-30	DIODE	
IC1			MB15E03SL-E1	MOS-IC	
IC200			NJM2591V	BI-POLAR IC	
IC300			R2A20178NP	DAC IC	
IC301			NJM12904RB1	MOS-IC	
IC302			TA7368PL	MOS-IC	
IC303-305			NJM12904RB1	MOS-IC	
IC400			F2136ACNKDRB	MCU	
IC401			EX24016ATAS0A	ROM IC	
IC500			XC6120N302N-G	MOS-IC	
IC501			XC6209B502P-G	MOS-IC	
IC503			XC6209B502P-G	MOS-IC	
Q1 ,2			RT1N141U-T111	TRANSISTOR	
Q3			2SC5383-T111	TRANSISTOR	
Q4			MCH3914(7)-H	FET	
Q5			2SC5108(Y)F	TRANSISTOR	
Q6			2SC5636	TRANSISTOR	
Q7			2SC5383-T111	TRANSISTOR	
Q100			2SC4926YD	TRANSISTOR	
Q101			RFM01U7P	FET	

Ref. No.	Address	New parts	Parts No.	Description	Destination
Q102			RD07MUS2BT112	FET	
Q103			RT1N141U-T111	TRANSISTOR	
Q200			RT1P237U-T111	TRANSISTOR	
Q201,202			KTC4080E-P	TRANSISTOR	
Q203,204			3SK318	FET	
Q300,301			RT1N441U-T111	TRANSISTOR	
Q302			2SK3577-A	FET	
Q303			SSM6J08FU(F)	FET	
Q304			RT1P237U-T111	TRANSISTOR	
Q305			RT1N144U-T111	TRANSISTOR	
Q306			2SK3577-A	FET	
Q400			2SC4919-S	TRANSISTOR	
Q401,402			RT1N144U-T111	TRANSISTOR	
Q500,501			SSM3J05FU-F	FET	
Q502			RT1P237U-T111	TRANSISTOR	
Q401,402			RT1N144U-T111	TRANSISTOR	
Q500,501			SSM3J05FU-F	FET	
Q502			RT1P237U-T111	TRANSISTOR	
TH100			B57331V2104J	THERMISTOR	

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

EXPLODED VIEW



A : N09-2438-05
B : N30-2606-48
C : N83-2005-48

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

ADJUSTMENT

Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range Modulation Output	350 to 390MHz Frequency modulation and external modulation –127dBm/0.1µV to greater than –47dBm/1mV
2. RF Power Meter	Input Impedance Operation Frequency Measurement Range	50Ω 350 to 390MHz Vicinity of 10W
3. Deviation Meter	Frequency Range	350 to 390MHz
4. Digital Volt Meter (DVM)	Measuring Range Input Impedance	10mV to 10V DC High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range Frequency Stability	10Hz to 1000MHz 0.2ppm or less
7. DC Ammeter		5A
8. AF Volt Meter (AF VTVM)	Frequency Range Voltage Range	50Hz to 10kHz 1mV to 10V
9. Audio Generator (AG)	Frequency Range Output	50Hz to 5kHz or more 0 to 1V
10. Distortion Meter	Capability Input Level	3% or less at 1kHz 50mV to 10Vrms
11. Spectrum Analyzer	Measuring Range	DC to 1GHz or more
12. Tracking Generator	Center Frequency Output Voltage	50kHz to 600MHz 100mV or more
13. 8Ω Dummy Load		Approx. 8Ω, 3W
14. Regulated Power Supply		5V to 10V, approx. 3A Useful if ammeter equipped

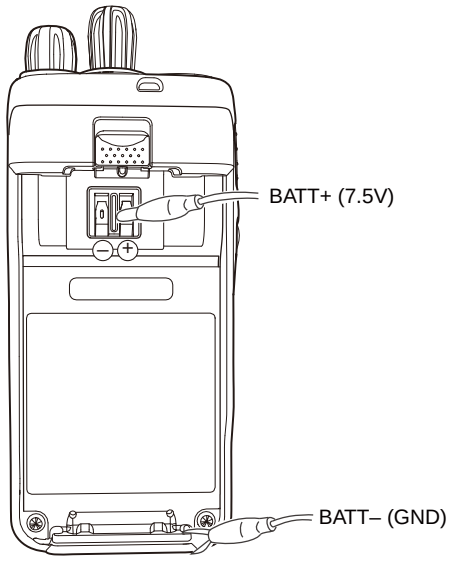
■ Antenna connector adapter

The antenna connector of this transceiver uses an SMA terminal.

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

■ DC Supply

BATT+, BATT– : External power supply terminal (Fasten it with an alligator clip.)



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.

■ Test Frequency (MHz)

CH	RX Frequency	TX Frequency
1	370.05000	370.10000
2	350.05000	350.10000
3	389.95000	389.90000
4	370.00000	370.00000
5	370.20000	370.20000
6	370.40000	370.40000
7~16	-	-

■ Signaling

No.	RX (Decode)	TX (Encode)
1	None	None
2	None	100Hz Square Wave
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 210.7Hz	QT 210.7Hz
6	QT 254.1Hz	QT 254.1Hz
7	DQT D023N	DQT D023N
8	DQT D754I	DQT D754I
9	None	DTMF (Code: 159D)
10	None	DTMF (Code: 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).

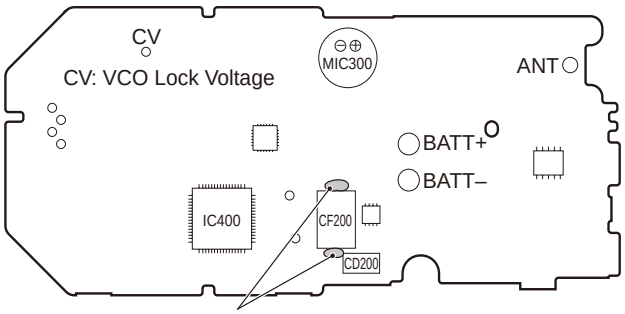
The speaker output connector must be terminated with a 8Ω dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during tuning.

■ Adjustment frequency (MHz)

Tuning point	RX	TX
Low	350.05000	350.10000
Center	370.05000	370.10000
High	389.95000	389.90000

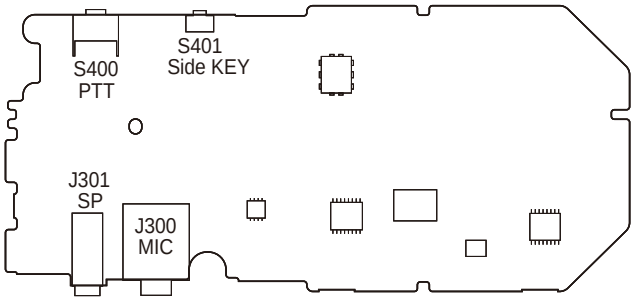
Adjustment Points

TX-RX UNIT Component side view



Note: When replacing CF200, apply bond to the point shown in the figure.

TX-RX UNIT Foil side view



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	1) Adj item: High		TX-RX	ANT (CV)		FPU	4.0V	±0.1V

Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency	1) Adj item: High Press [Transmit] button.	f. counter	TX-RX	ANT		FPU	389.900MHz	±50Hz
2. High Transmit Power and Protective Current	1) Adj item: Low, Center, High (3 points) BATT terminal voltage: 7.5V Press [Transmit] button.	Power meter Ammeter				FPU	3.8W	±0.1W 2.0A or less
3. Low Transmit Power	1) Adj item: Low, Center, High (3 points) BATT terminal voltage: 7.5V Press [Transmit] button.						1.0W	±0.1W 1.0A or less
4. DQT Balance [Wide]	1) Adj item: Low, Center, High (3 points) (Signaling Square Wave) Deviation meter filter LPF: 3kHz HPF: OFF Press [Transmit] button.	Power meter Deviation meter Oscilloscope AG AF VTVM	TX-RX	ANT SP/MIC connector		FPU	Make the modulation wave into square waves.	
5. Maximum Deviation [Wide]	1) Adj item: Center, Low, High (3 points) AG: 1kHz/150mV Deviation meter filter LPF: 15kHz HPF: OFF Press [Transmit] button.						4.0kHz (According to the larger +, –)	±100Hz
6. Battery Warning Level	1) BATT terminal voltage: 5.9V	DVM	TX-RX	BATT terminal		FPU	Write	BATT terminal voltage: 5.9V
7. Battery Detection Check (User mode)	1) BATT terminal voltage: 5.7V PTT: ON	Power meter		ANT			Check	LED blinks No transmit power
	2) BATT terminal voltage: 7.5V PTT: ON	DVM		BATT terminal				LED does not blink

• This transceiver is designed to make adjustments simple.
• It is not necessary to adjust the fixed values for the DTMF-DEV, DQT-DEV, QT-DEV, and MIC sensitivity.
• The TX-DEV Narrow setting uses the Wide calculated adjustment level value.

ADJUSTMENT

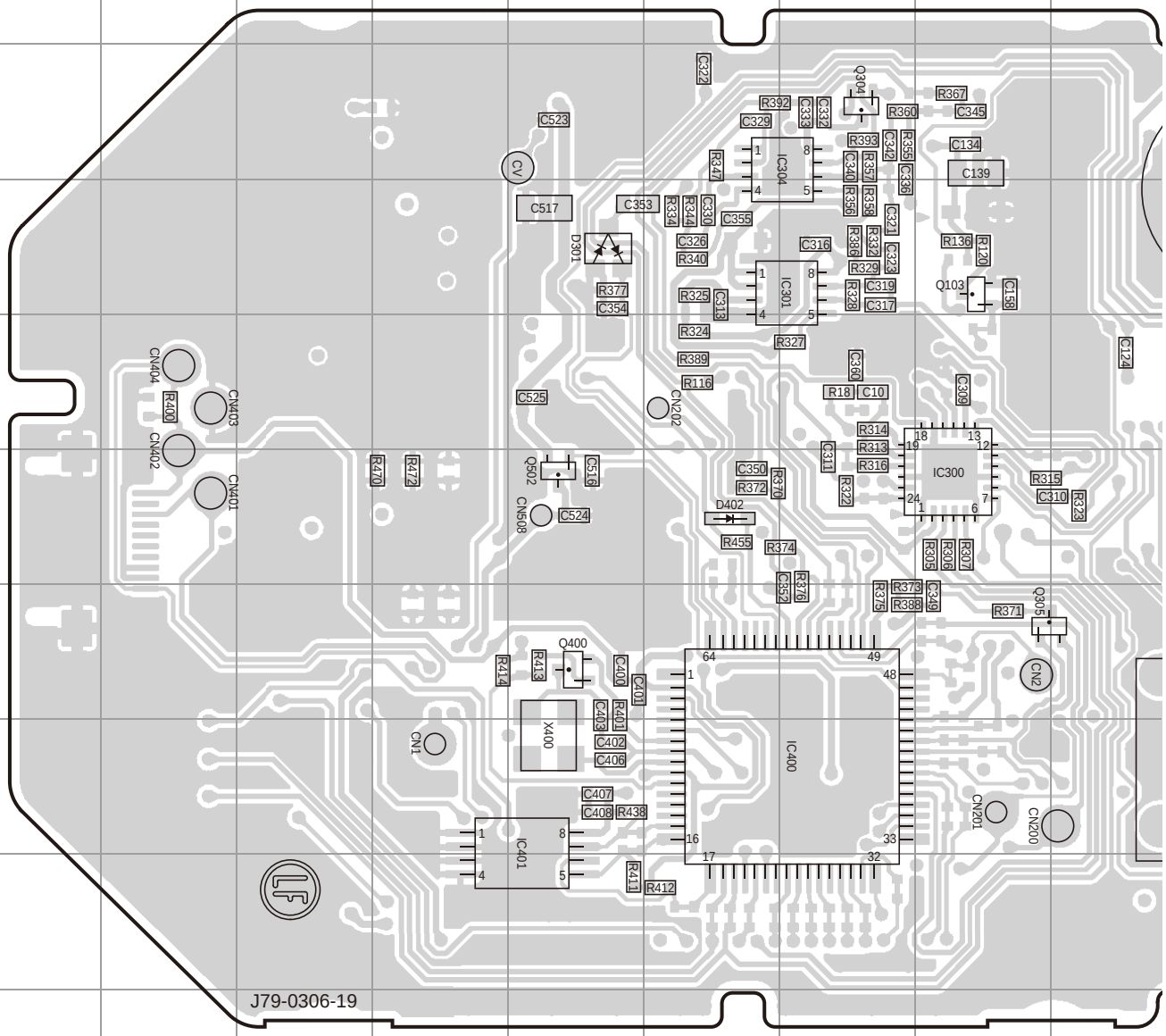
Receiver Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Sensitivity Check [Narrow]	1) Adj item: Low, High (2 points) SSG output: –115dBm (0.4µV) SSG DEV: 1.5kHz	SSG DVM Oscilloscope AF VTVM	TX-RX	ANT SP/MIC connector			Check	12dB SINAD or more
[Wide]	2) TEST CH: 1 SSG output: –117dBm (0.32µV) SSG DEV: 3.0kHz							
2. Squelch Level 5 Write [Wide]	(3 points) 1) Adj item: Low SSG output: –121dBm (0.2µV) SSG DEV: 3.0kHz 2) Adj item: Center SSG output: –122dBm (0.178µV) SSG DEV: 3.0kHz 3) Adj item: High SSG output: –122dBm (0.178µV) SSG DEV: 3.0kHz					FPU	Write	
[Narrow]	(3 points) 4) Adj item: Low SSG output: –120dBm (0.22µV) SSG DEV: 1.5kHz 5) Adj item: Center SSG output: –120dBm (0.22µV) SSG DEV: 1.5kHz 6) Adj item: High SSG output: –120dBm (0.22µV) SSG DEV: 1.5kHz							

• It is not necessary to adjust the fixed value for the BPF.
• The Squelch Level 9 setting uses the Squelch Level 5 calculated adjustment level value.

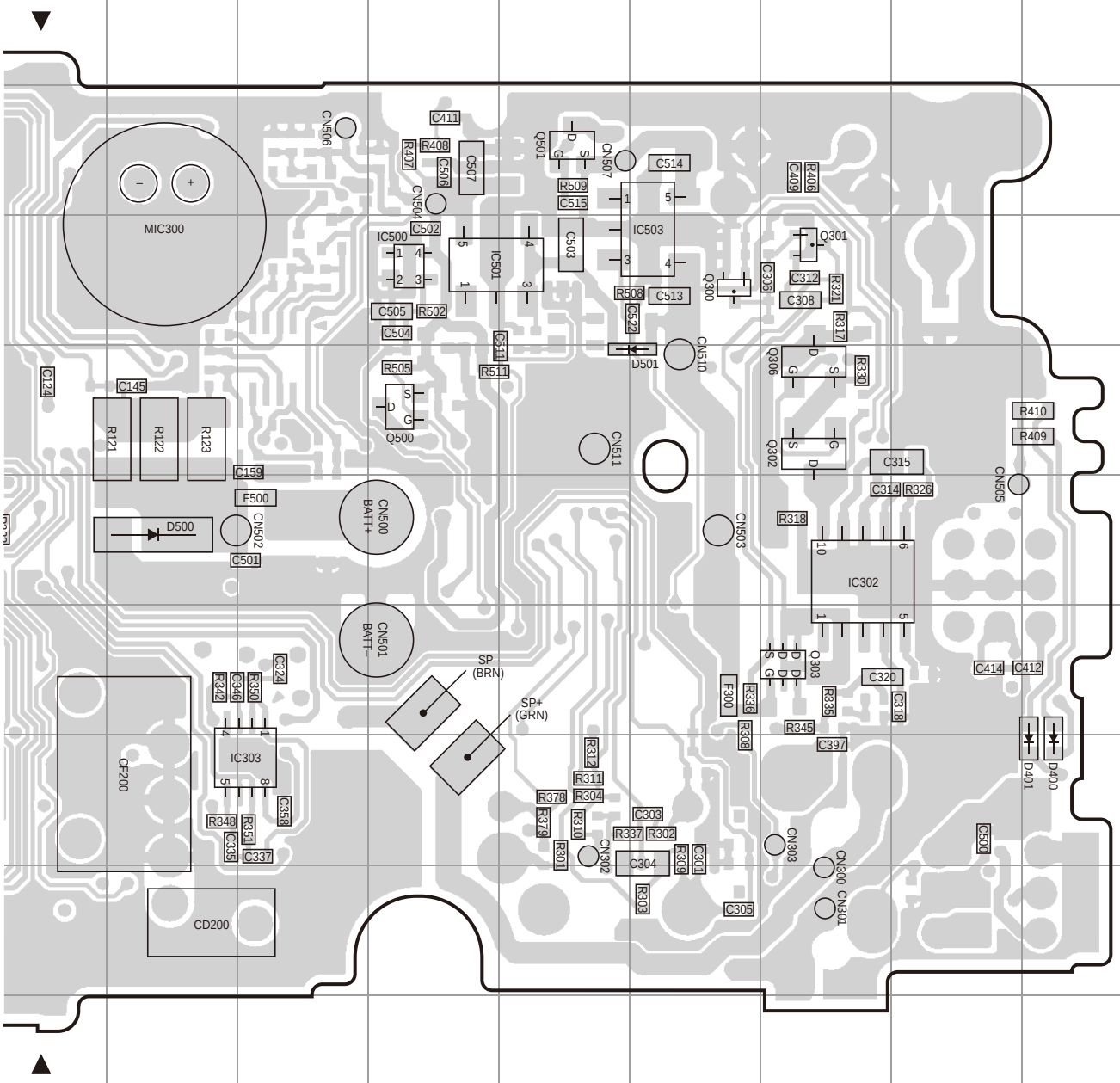
TK-3000 PC BOARD

TX-RX UNIT (X57-8100-23) Component side view (J79-0306-19)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC300	6I	Q103	4I	Q501	3N
IC301	4H	Q300	4O	Q502	6F
IC302	6P	Q301	4P	D301	4F
IC303	8L	Q302	5P	D400	8R
IC304	3H	Q303	7P	D401	8R
IC400	8H	Q304	3H	D402	6G
IC401	8F	Q305	7I	D500	6K
IC500	4M	Q306	5P	D501	5O
IC501	4M	Q400	7F		
IC503	4O	Q500	5M		

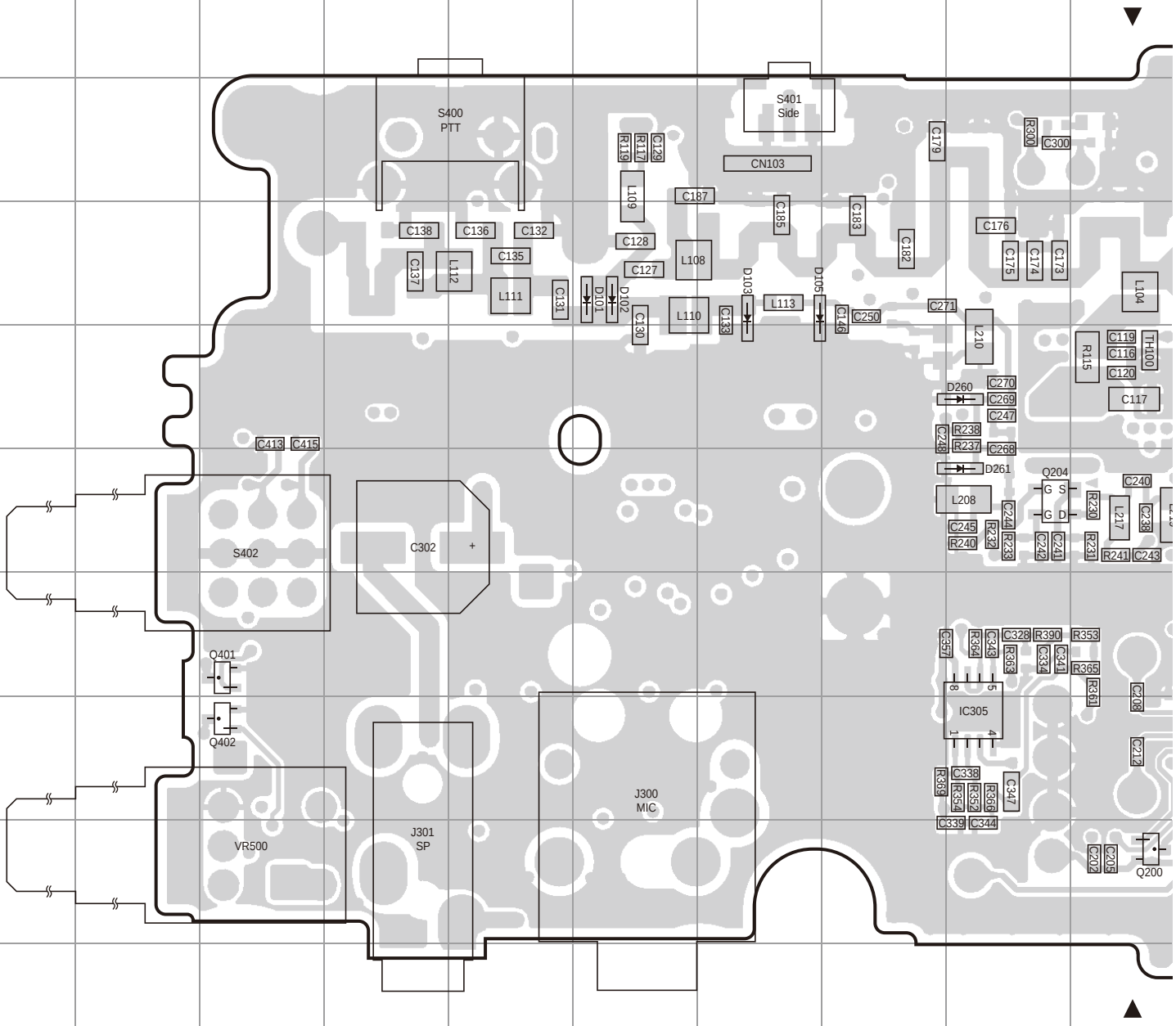
TX-RX UNIT (X57-8100-23) Component side view (J79-0306-19)



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

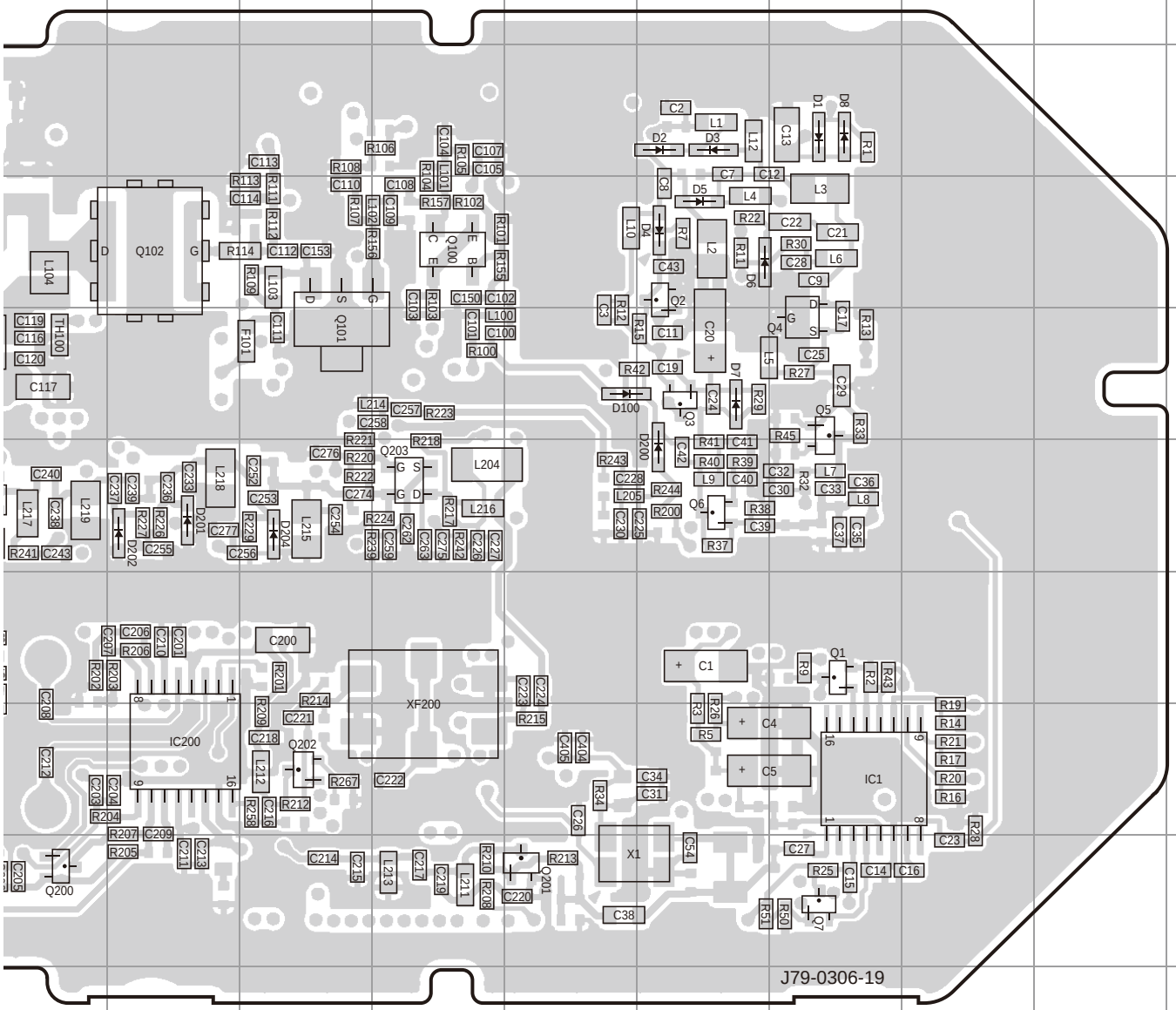
TK-3000 PC BOARD

TX-RX UNIT (X57-8100-23) Foil side view (J79-0306-19)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	8P	Q100	4M	D1	3P	D102	4F
IC200	8K	Q101	5L	D2	3O	D103	4G
IC305	8I	Q102	4K	D3	3O	D105	4G
Q1	7P	Q200	9J	D4	4O	D200	6O
Q2	4O	Q201	9N	D5	4O	D201	6K
Q3	5O	Q202	8L	D6	4O	D202	6K
Q4	5P	Q203	6M	D7	5O	D204	6L
Q5	5P	Q204	6I	D8	3P	D260	5I
Q6	6O	Q401	7C	D100	5N	D261	6I
Q7	9P	Q402	8C	D101	4F		

TX-RX UNIT (X57-8100-23) Foil side view (J79-0306-19)



Component side

Layer 1

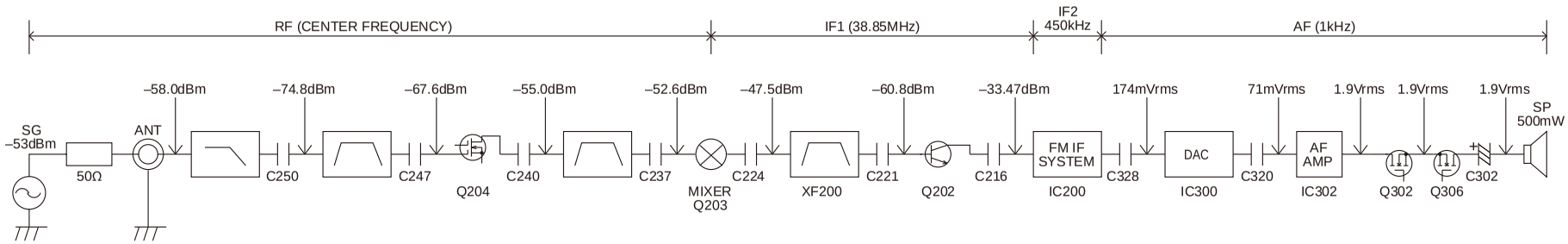
Layer 2

Layer 3

Layer 4

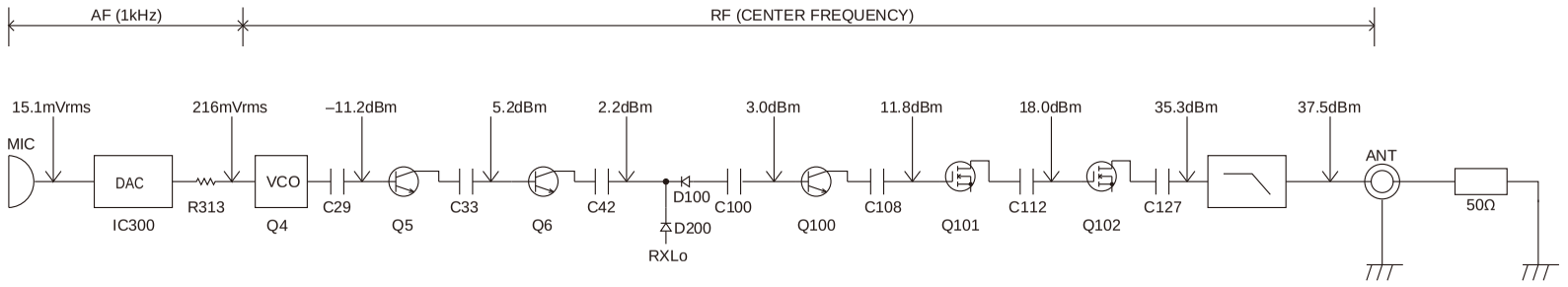
Foil side

Receiver Section



To make measurements in the AF section, connect the AC level meter.
(ANT input: –53dBm,1kHz FM, 1.5kHz Dev (Narrow).)
In the RF section, use a high impedance probe. (ANT input: –53dBm, MOD off).

Transmitter Section

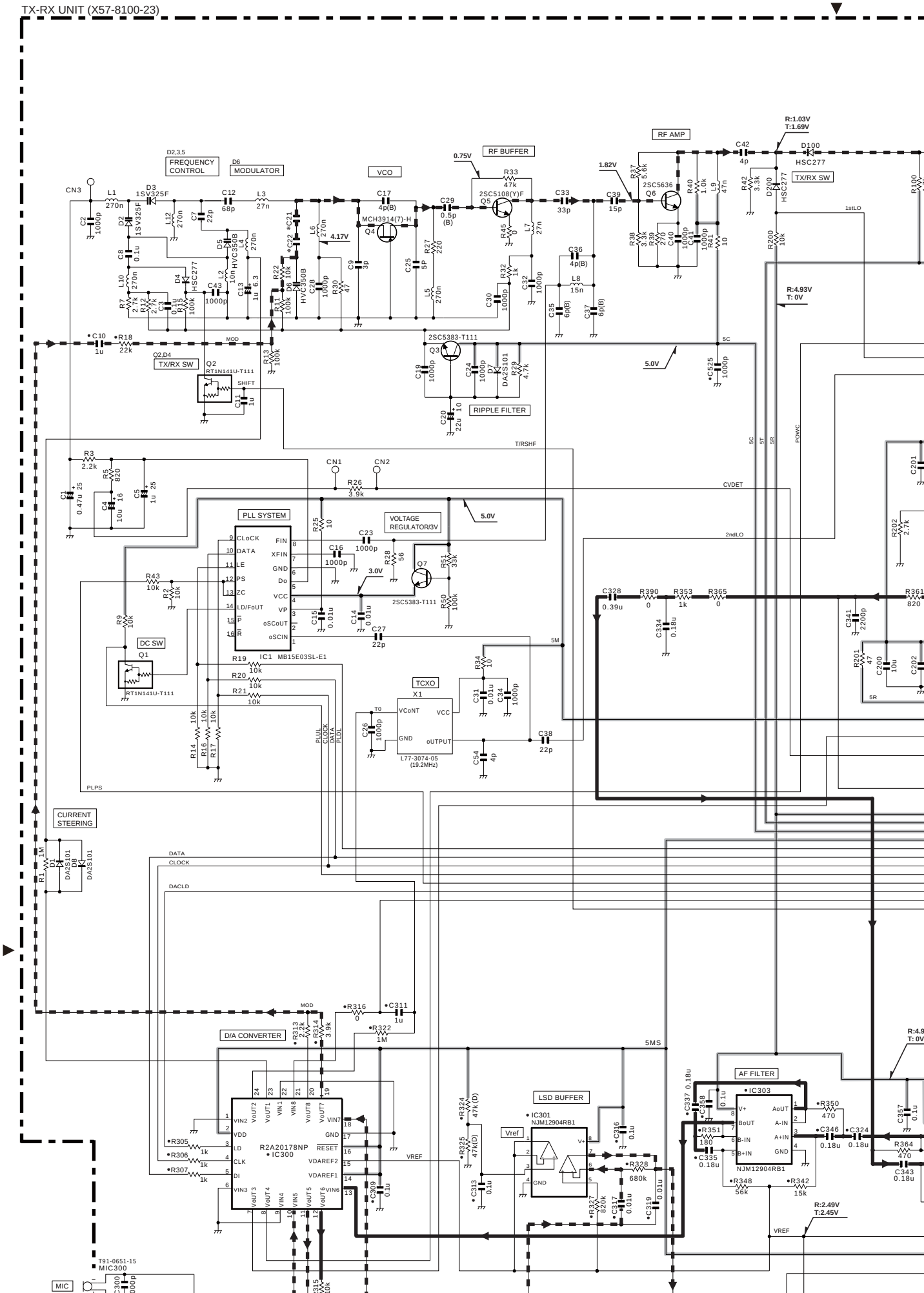


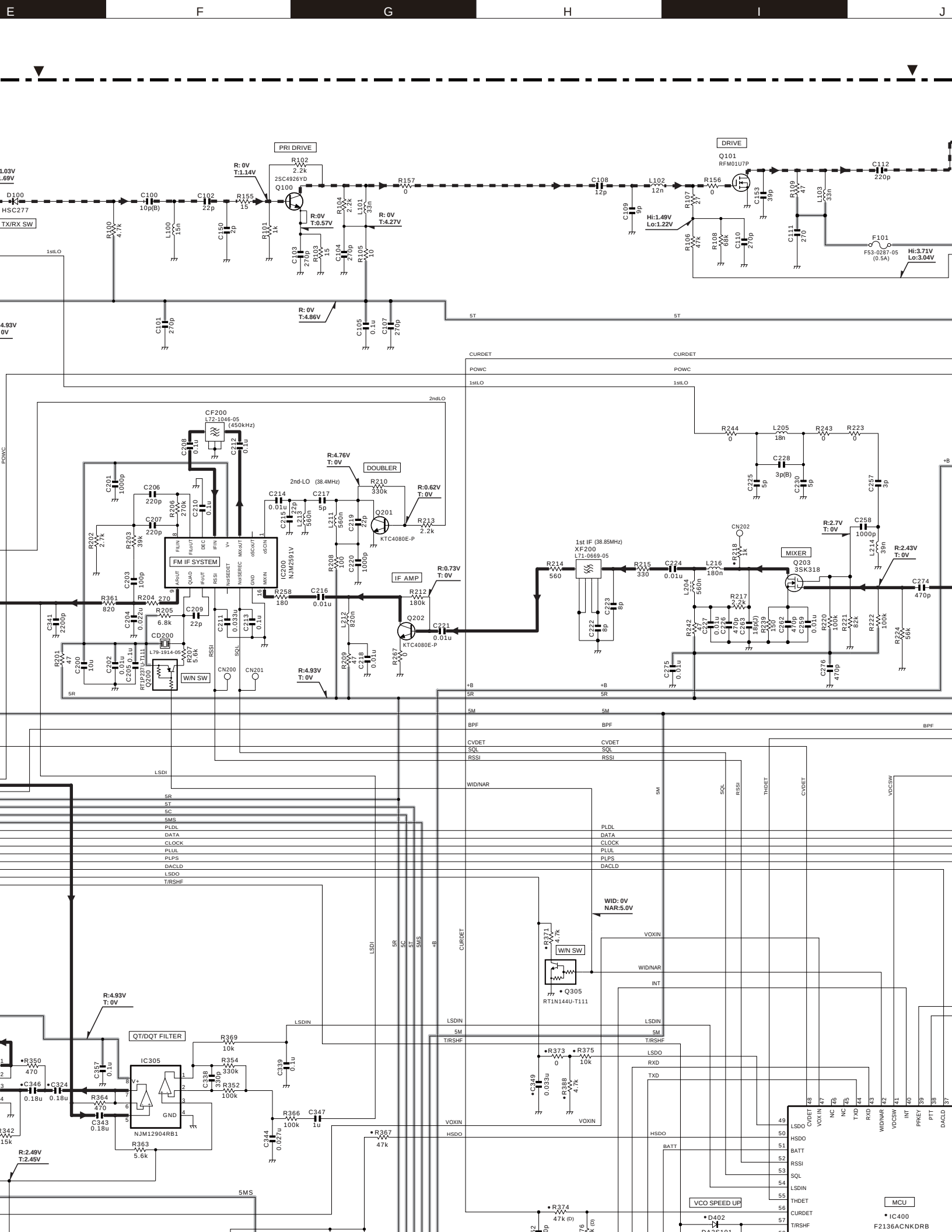
AG is set to the MIC input becomes 1.5kHz Dev, at 1kHz MOD. (Narrow)
To make measurements in the AF section, connect the AC level meter.
In the RF section, use a 1000pF coupling capacitor.

SCHEMATIC DIAGRAM TK-3000

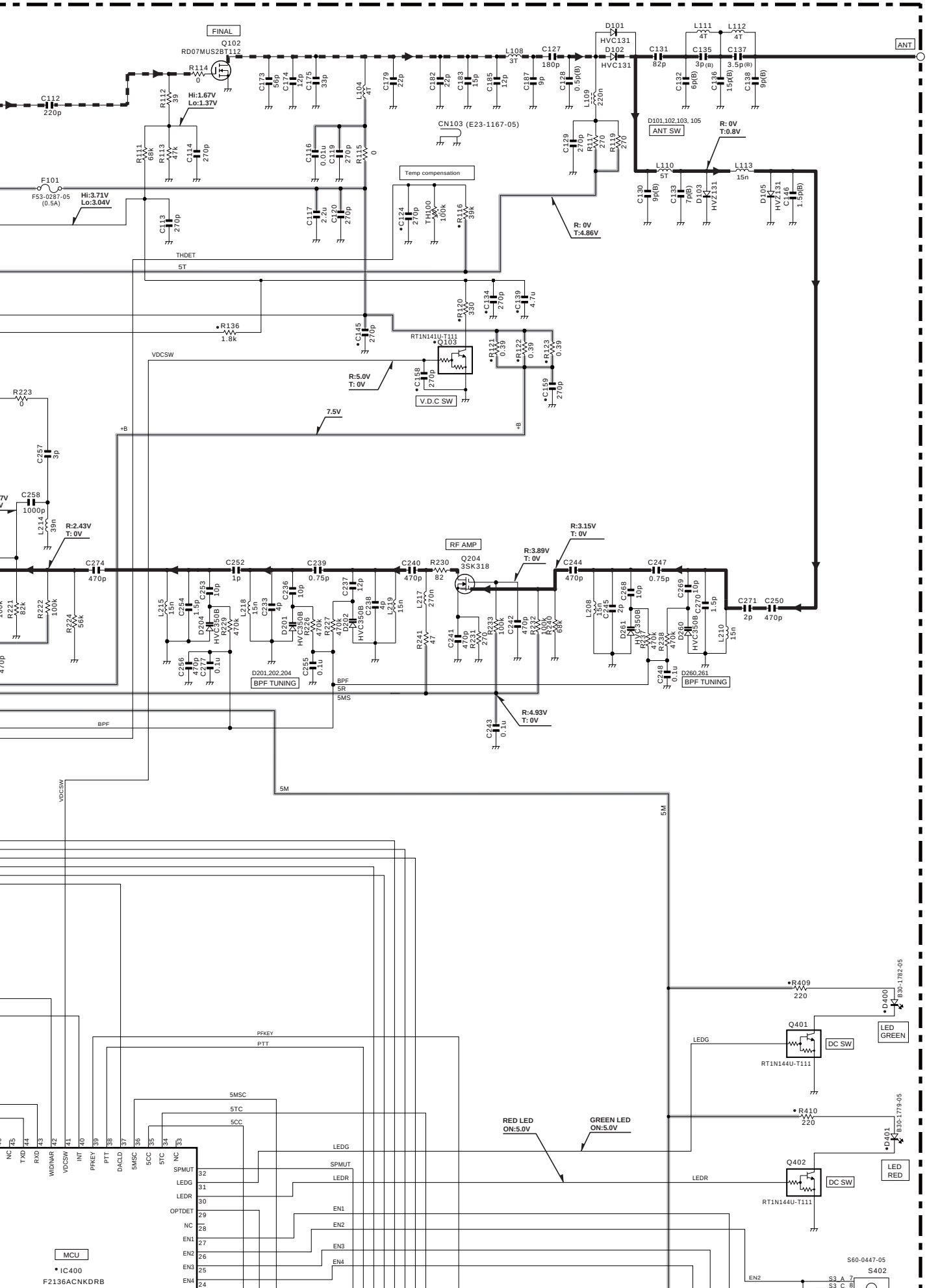
TX-RX UNIT (X57-8100-23)

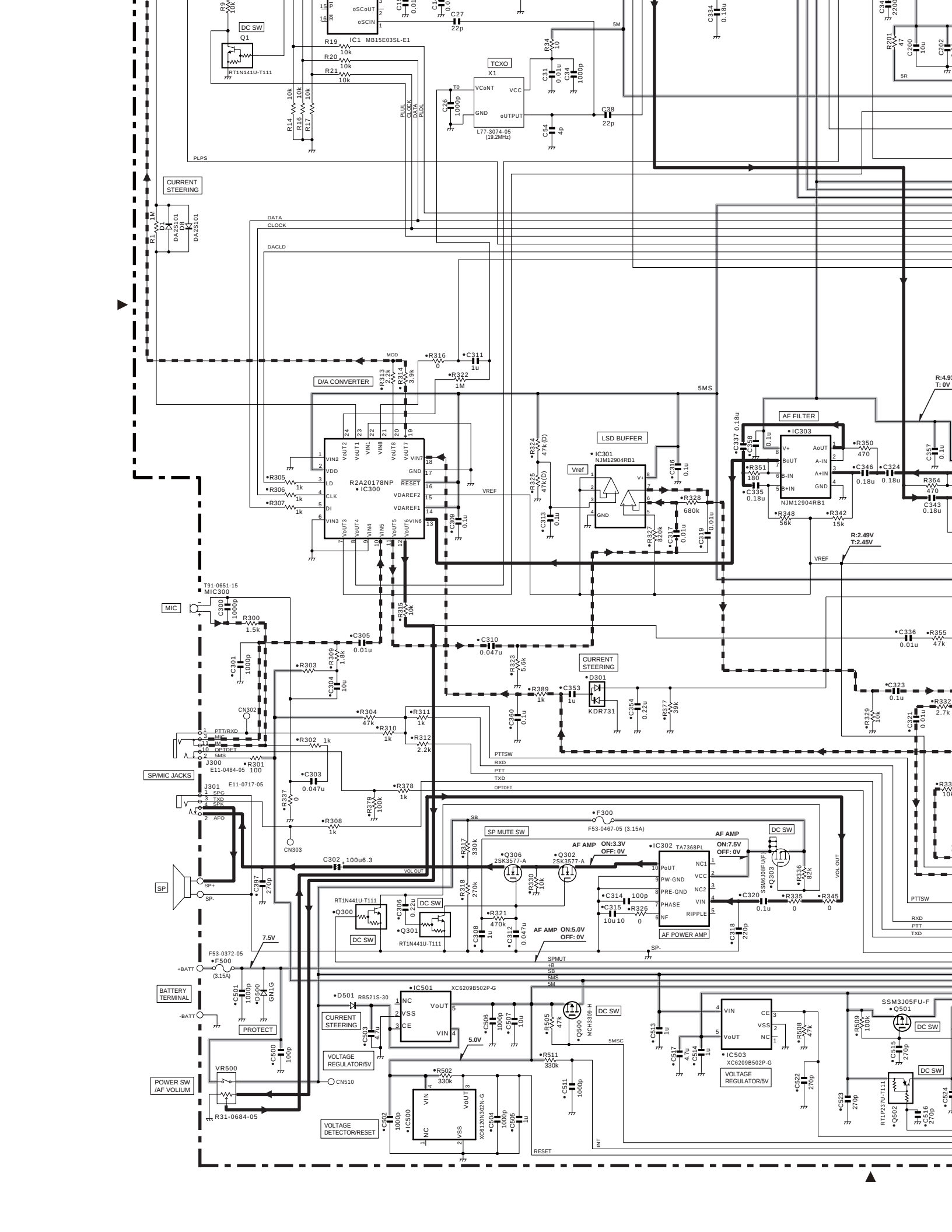
Note : The components marked with a dot (•) are parts of layer 1.

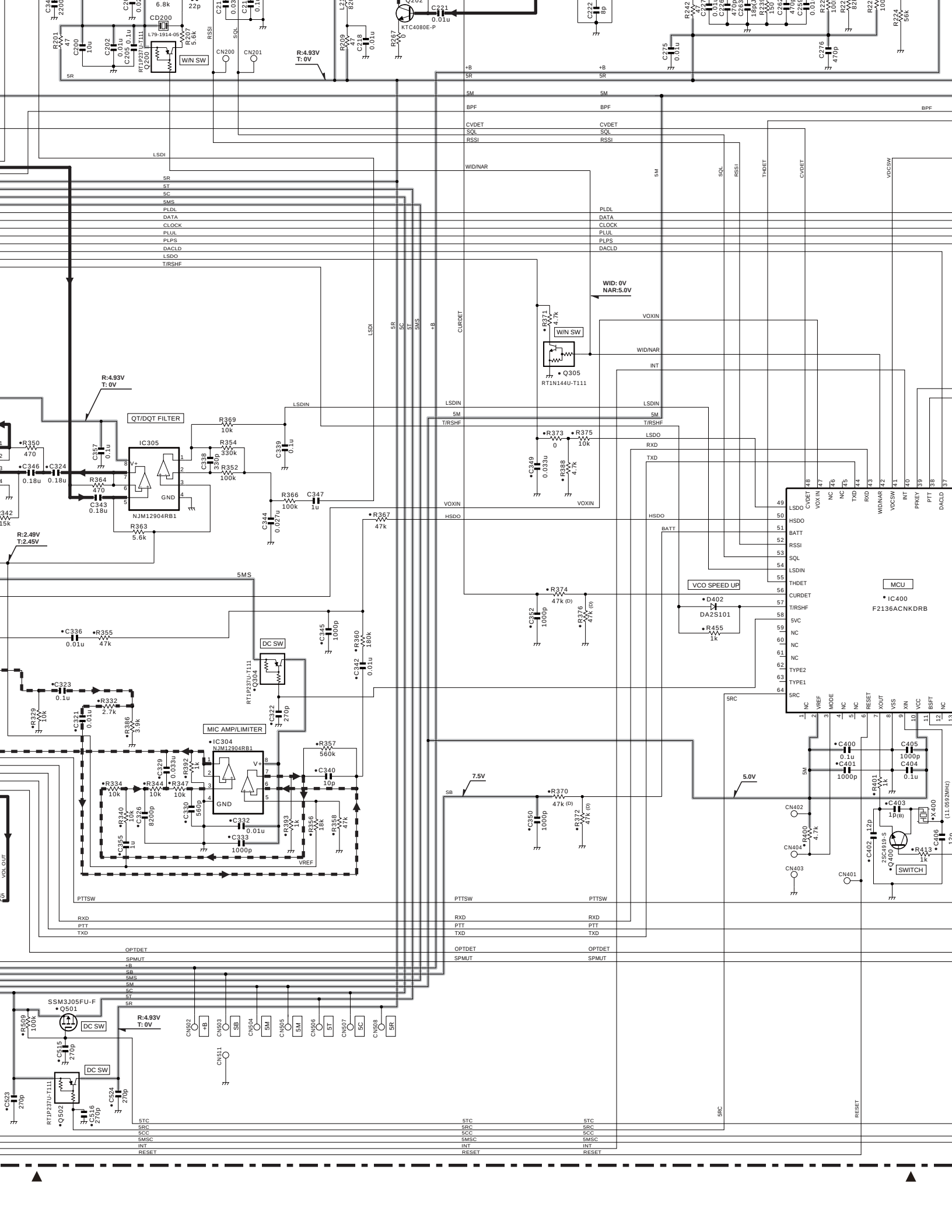

TX-RX UNIT (X57-8100-23)
FREQUENCY CONTROL
MODULATOR
VCO
RF BUFFER
RF AMP
TX/RX SW
RIPPLE FILTER
PLL SYSTEM
VOLTAGE REGULATOR/3V
DC SW
TCXO
D/A CONVERTER
LSD BUFFER
AF FILTER
CURRENT STEERING
IC1 MB15E03SL-E1
IC300 R2A20178NP
IC301 NJM12904RB1
IC303 NJM12904RB1
L77-3074-05 (19.2MHz)
MIC300 T91-0651-15
2SC5108(Y)F
2SC5636
2SC5383-T111
RT1N141U-T111
MCH3914(7)-H
HSC277
1SV325F
HVC350B
DA2S101
0.75V
1.82V
4.17V
3.0V
5.0V
R:1.03V T:1.69V
R:4.93V T: 0V
R:2.49V T:2.45V
CN1
CN2
CN3
1stLO
2ndLO
CVDET
T/RSHF
POWC
MOD
SHIFT
DATA
CLOCK
DACLD
PLPS
VREF
MIC

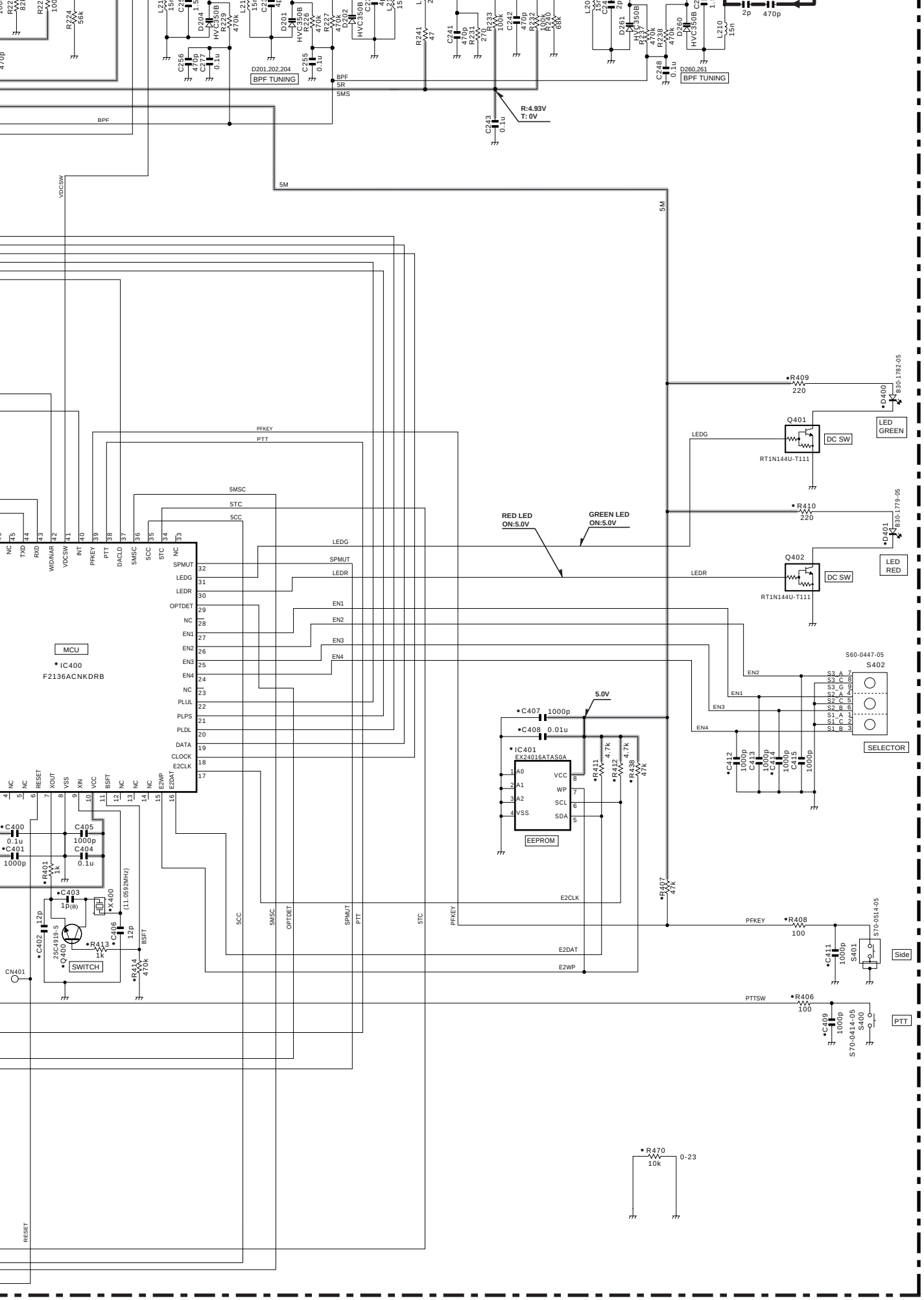

E
F
G
H
I
J
PRI DRIVE
DRIVE
Q101
RFM01U7P
Q100
2SC4926YD
D100
HSC277
TX/RX SW
1stLO
2ndLO
CF200
L72-1046-05
(450kHz)
DOUBLER
2nd-LO (38.4MHz)
KTC4080E-P
FM IF SYSTEM
IC200
NJM2591V
IF AMP
KTC4080E-P
1st IF (38.85MHz)
XF200
L71-0669-05
MIXER
Q203
3SK318
CD200
L79-1914-05
W/N SW
Q200
RT1P237U-T111
Q305
RT1N144U-T111
QT/DQT FILTER
IC305
NJM12904RB1
VCO SPEED UP
D402
MCU
IC400
F2136ACNKDRB
F101
F53-0287-05
(0.5A)
CN200
CN201
CN202
POWC
CURDET
LSDI
5R
5T
5C
5MS
PLDL
DATA
CLOCK
PLUL
PLPS
DACLD
LSDO
T/RSHF
WID/NAR
BPF
CVDET
SQL
RSSI
5M
+B
VOXIN
HSDO
BATT
INT
LSDIN
RXD
TXD
THDET
VDCSW
PRKEY
PTT
R:0V T:1.14V
R:0V T:0.57V
R:0V T:4.27V
R:0V T:4.86V
Hi:1.49V Lo:1.22V
Hi:3.71V Lo:3.04V
R:4.76V T: 0V
R:0.62V T: 0V
R:0.73V T: 0V
R:4.93V T: 0V
R:2.7V T: 0V
R:2.43V T: 0V
R:2.49V T:2.45V
WID: 0V NAR:5.0V

SCHEMATIC DIAGRAM TK-3000



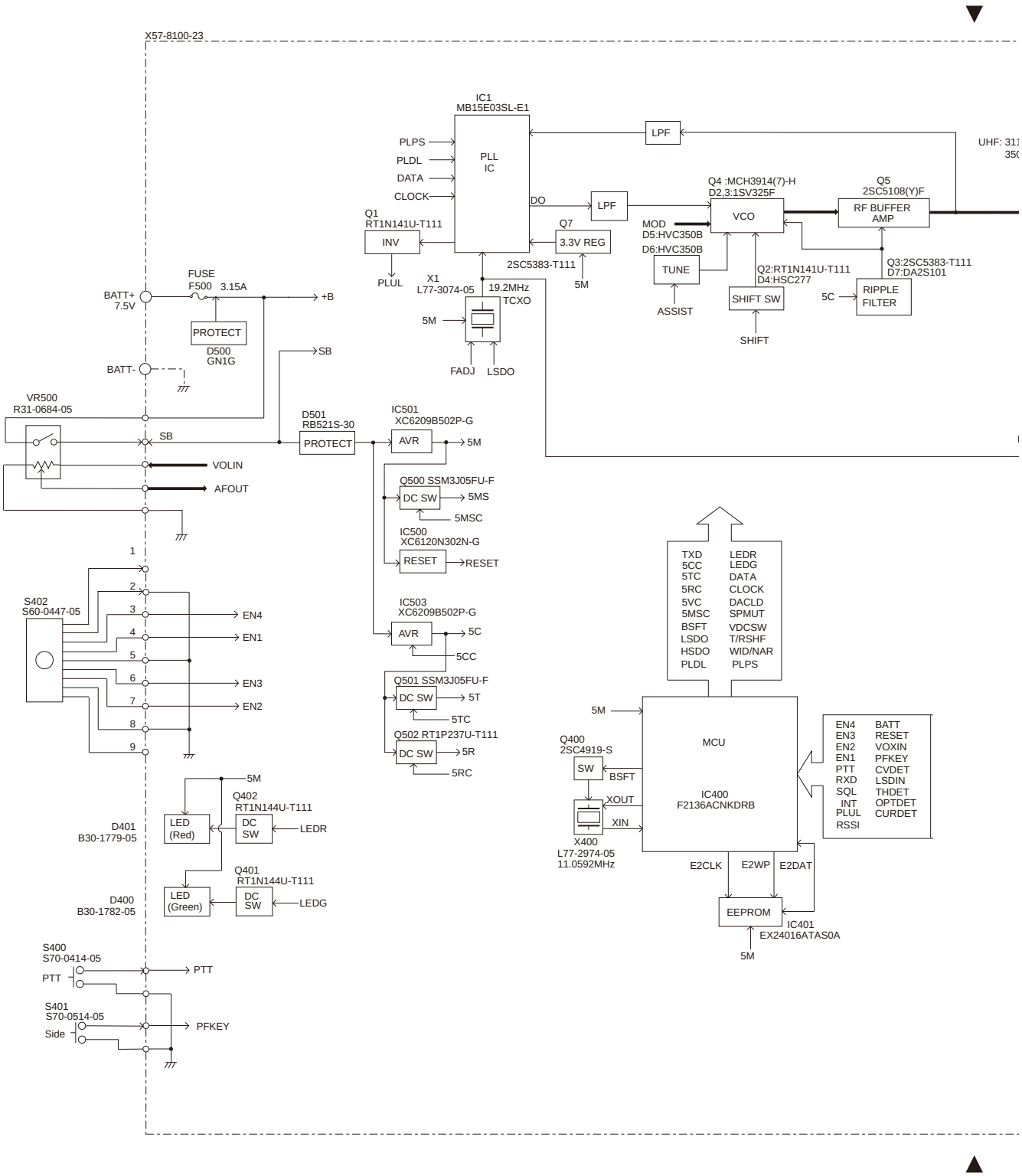

DC SW
Q1
RT1N141U-T111
IC1 MB15E03SL-E1
TCXO
X1
L77-3074-05 (19.2MHz)
CURRENT STEERING
D/A CONVERTER
IC300 R2A20178NP
LSD BUFFER
IC301 NJM12904RB1
Vref
AF FILTER
IC303 NJM12904RB1
MIC
MIC300 T91-0651-15
SP/MIC JACKS
J300 E11-0484-05
J301 E11-0717-05
CN302
CN303
SP
SP MUTE SW
F300 F53-0467-05 (3.15A)
AF AMP ON:3.3V OFF: 0V
AF AMP ON:7.5V OFF: 0V
AF AMP ON:5.0V OFF: 0V
IC302 TA7368PL
AF POWER AMP
Q306 2SK3577-A
Q302 2SK3577-A
Q300 RT1N441U-T111
Q301 RT1N441U-T111
Q303 SSM6J08F(F)
BATTERY TERMINAL
F500 F53-0372-05 (3.15A)
PROTECT
D500 GN1G
D501 RB521S-30
IC501 XC6209B502P-G
IC503 XC6209B502P-G
Q500 MCH3309-H
Q501 SSM3J05FU-F
Q502 RT1P237U-T111
VOLTAGE REGULATOR/5V
VOLTAGE DETECTOR/RESET
IC500 XC6120N302N-G
POWER SW /AF VOLIUM
VR500 R31-0684-05
CN510
DATA
CLOCK
DACLD
PLPS
MOD
VREF
5MS
5M
5MSC
SB
+B
PTTSW
RXD
PTT
TXD
OPTDET
VOL OUT
SPMUT
INT
RESET
7.5V
5.0V
R:2.49V T:2.45V
R:4.93 T: 0V


W/N SW
CD200
L79-1914-05
Q200
RT1P237U-T111
KTC4080E-P
Q202
CN200
CN201
R:4.93V
T: 0V
RSSI
SQL
+B
5R
5M
BPF
CVDET
SQL
RSSI
LSDI
WID/NAR
5R
5T
5C
5MS
PLDL
DATA
CLOCK
PLUL
PLPS
DACLD
LSDO
T/RSHF
WID: 0V
NAR:5.0V
R371
4.7k
W/N SW
Q305
RT1N144U-T111
VOXIN
WID/NAR
INT
CURDET
LSDIN
T/RSHF
LSDO
RXD
TXD
VOXIN
HSDO
BATT
QT/DQT FILTER
IC305
NJM12904RB1
R:2.49V
T:2.45V
5MS
VCO SPEED UP
D402
DA2S101
MCU
IC400
F2136ACNKDRB
DC SW
Q304
RT1P237U-T111
MIC AMP/LIMITER
IC304
NJM12904RB1
VREF
7.5V
5.0V
SB
PTTSW
RXD
PTT
TXD
OPTDET
SPMUT
SSM3J05FU-F
Q501
Q502
CN502
CN503
CN504
CN505
CN506
CN507
CN508
CN511
CN402
CN404
CN403
CN401
X400
(11.0592MHz)
Q400
2SC4915-S
SWITCH
5TC
5RC
5CC
5MSC
INT
RESET

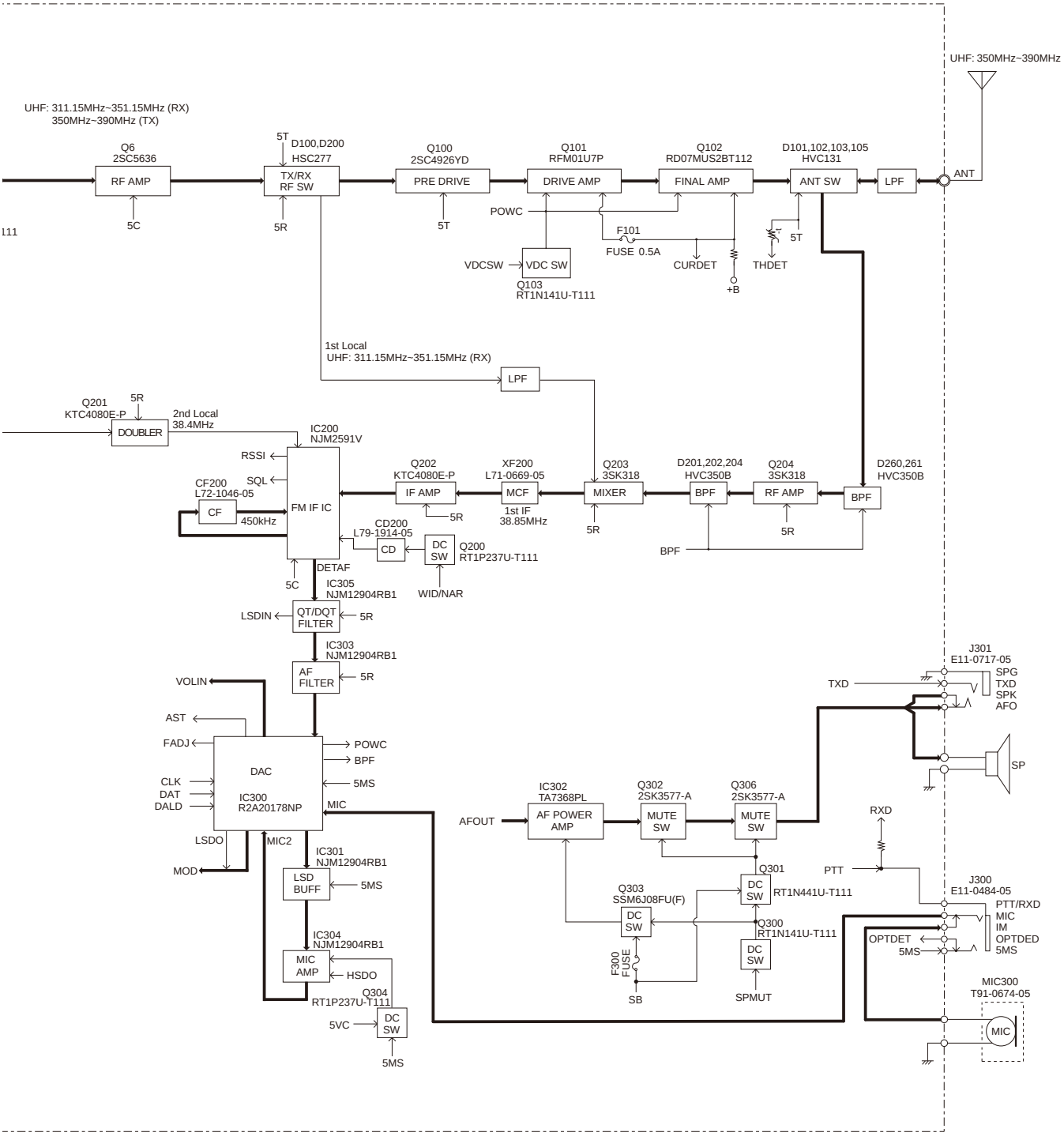


Note : The components marked with a dot (•) are parts of layer 1.

BLOCK DIAGRAM



BLOCK DIAGRAM



TK-3000

SPECIFICATIONS

General

Frequency Range	350~390MHz
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 10 hours at 4 watts (5-5-90 duty cycle, save off) With KNB-63L battery
Operating Temperature Range	–20°C to +60°C
Frequency Stability	±2.5ppm
Channel Frequency Spread	40MHz
Dimensions and Weight (Dimensions not including protrusions)	
Radio Only	54 W x 113 H x 14 D mm, 130g
With KNB-63L battery (1130mAh battery)	54 W x 113 H x 24.9 D mm, 203g

Receiver (Measurements made per TIA/EIA-603)

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

Transmitter (Measurements made per TIA/EIA-603)

RF Output Power	4W/1W
Spurious Response	65dB
Modulation	16K0F3E (Wide) / 11K0F3E (Narrow)
FM Hum & Noise	45dB (Wide) / 40dB (Narrow)
Modulation Distortion	Less than 5%

Measurements made per TIA/EIA-603 and specifications shown are typical.
Kenwood reserves the right to change specifications without prior notice or obligation.

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

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Kenwood Electronics Deutschland GmbH
Rembrücker Str. 15, 63150 Heusenstamm, Germany

Kenwood Electronics Belgium N.V.
Leuvensesteenweg 248 J, 1800 Vilvoorde, Belgium

Kenwood Electronics France S.A.
L' Etoile Paris Nord 2, 50 Allée des Impressionnistes, Bp 58416 Villepinte, 95944 Roissy Ch De Gaulle Cedex

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KENWOOD House, Dwight Road, Watford, Herts., WD18 9EB United Kingdom

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Bolivia, 239-08020 Barcelona, Spain

Kenwood Electronics Australia Pty. Ltd.
Talavera Business Park Building A, 4 Talavera Road, North Ryde NSW 2113 Australia

Kenwood Electronics (Hong Kong) Ltd.
Suite 2504, 25/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, New Territories, Hong Kong

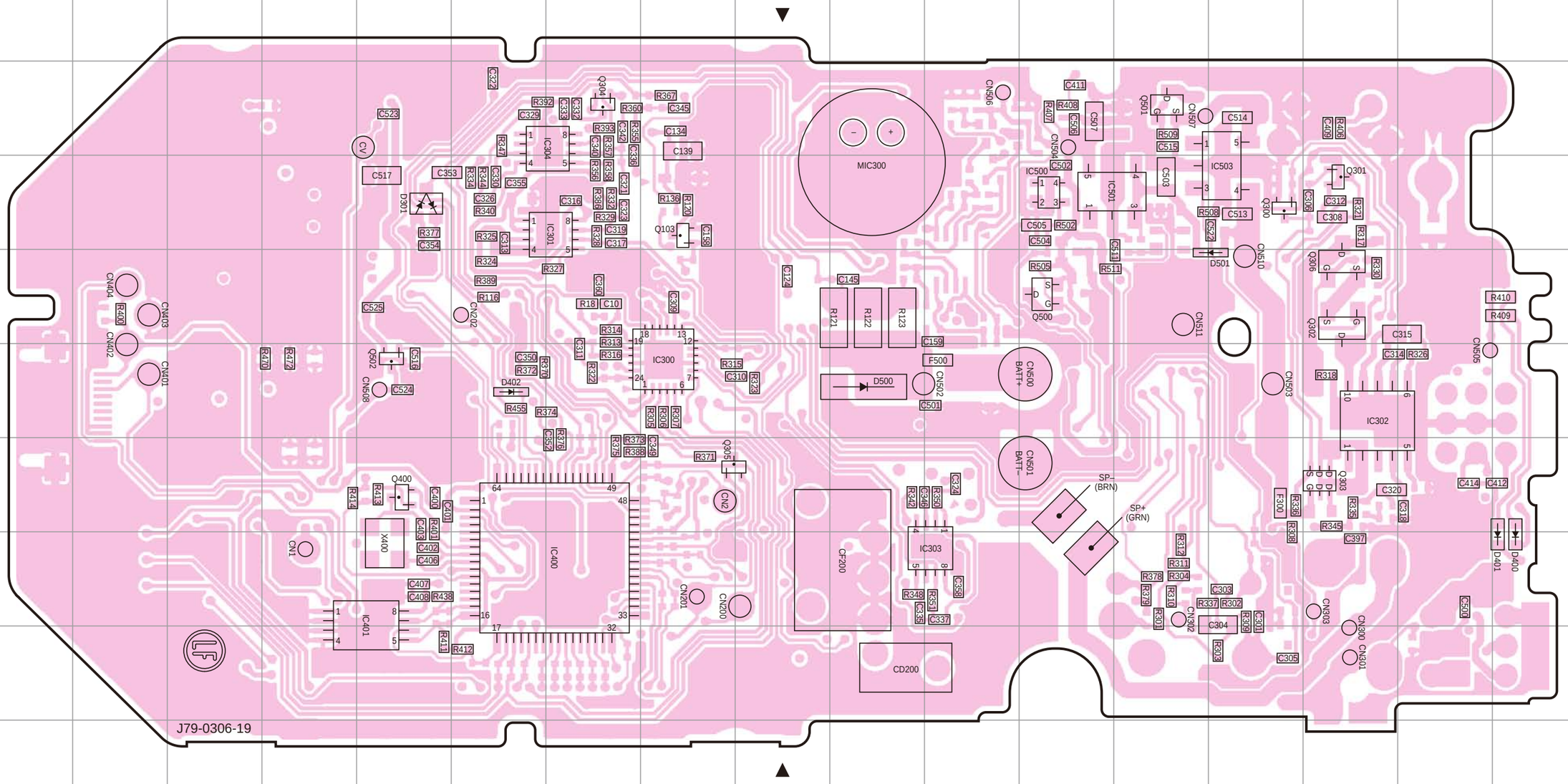
Kenwood Electronics Singapore Pte Ltd
1 Ang Mo Kio Street 63, Singapore 569110

TK-3000 PC BOARD

PC BOARD TK-3000

TX-RX UNIT (X57-8100-23) Component side view (J79-0306-19)

TX-RX UNIT (X57-8100-23) Component side view (J79-0306-19)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC300	6I	Q103	4I	Q501	3N
IC301	4H	Q300	4O	Q502	6F
IC302	6P	Q301	4P	D301	4F
IC303	8L	Q302	5P	D400	8R
IC304	3H	Q303	7P	D401	8R
IC400	8H	Q304	3H	D402	6G
IC401	8F	Q305	7I	D500	6K
IC500	4M	Q306	5P	D501	5O
IC501	4M	Q400	7F		
IC503	4O	Q500	5M		

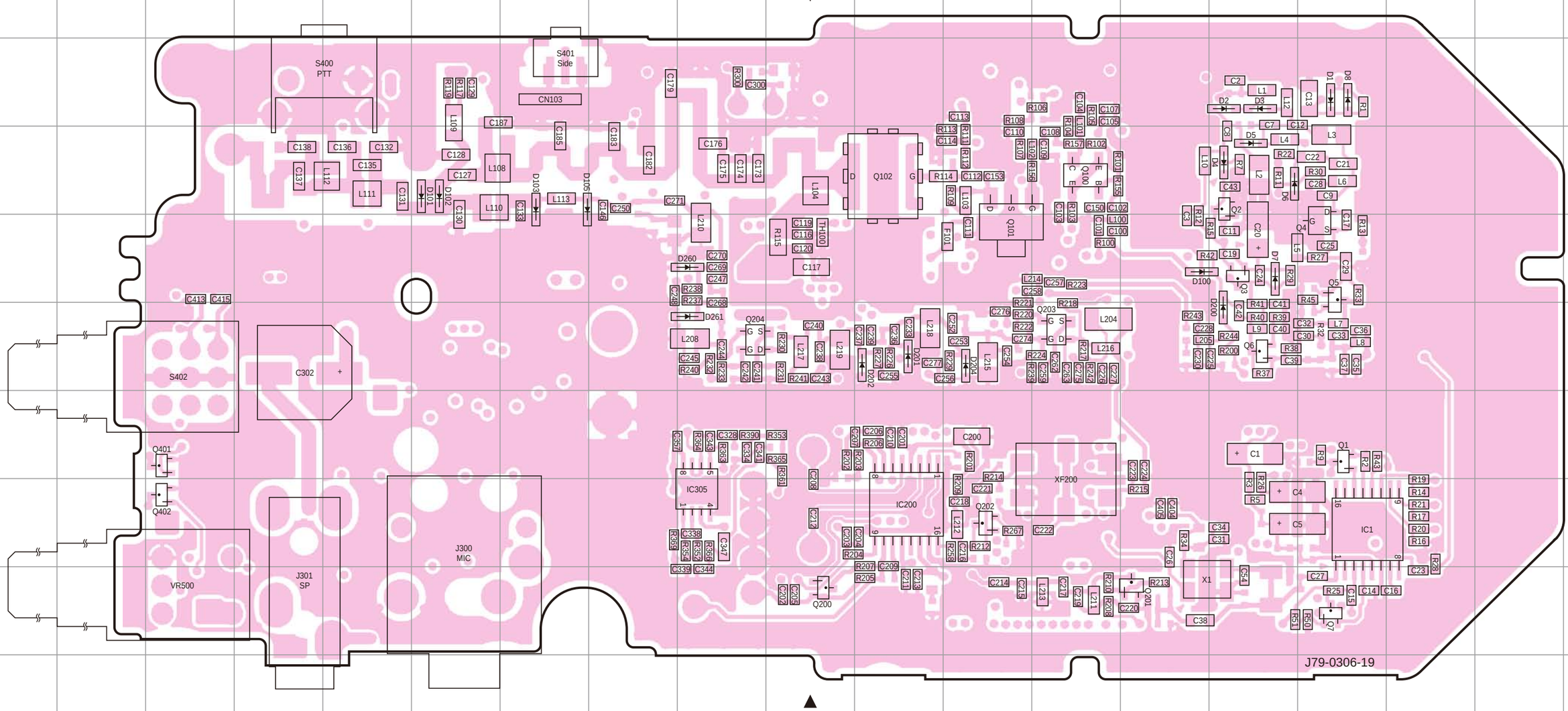
Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

TK-3000 PC BOARD

PC BOARD TK-3000

TX-RX UNIT (X57-8100-23) Foil side view (J79-0306-19)

TX-RX UNIT (X57-8100-23) Foil side view (J79-0306-19)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	8P	Q100	4M	D1	3P	D102	4F
IC200	8K	Q101	5L	D2	3O	D103	4G
IC305	8I	Q102	4K	D3	3O	D105	4G
Q1	7P	Q200	9J	D4	4O	D200	6O
Q2	4O	Q201	9N	D5	4O	D201	6K
Q3	5O	Q202	8L	D6	4O	D202	6K
Q4	5P	Q203	6M	D7	5O	D204	6L
Q5	5P	Q204	6I	D8	3P	D260	5I
Q6	6O	Q401	7C	D100	5N	D261	6I
Q7	9P	Q402	8C	D101	4F		

Component side

Layer 1

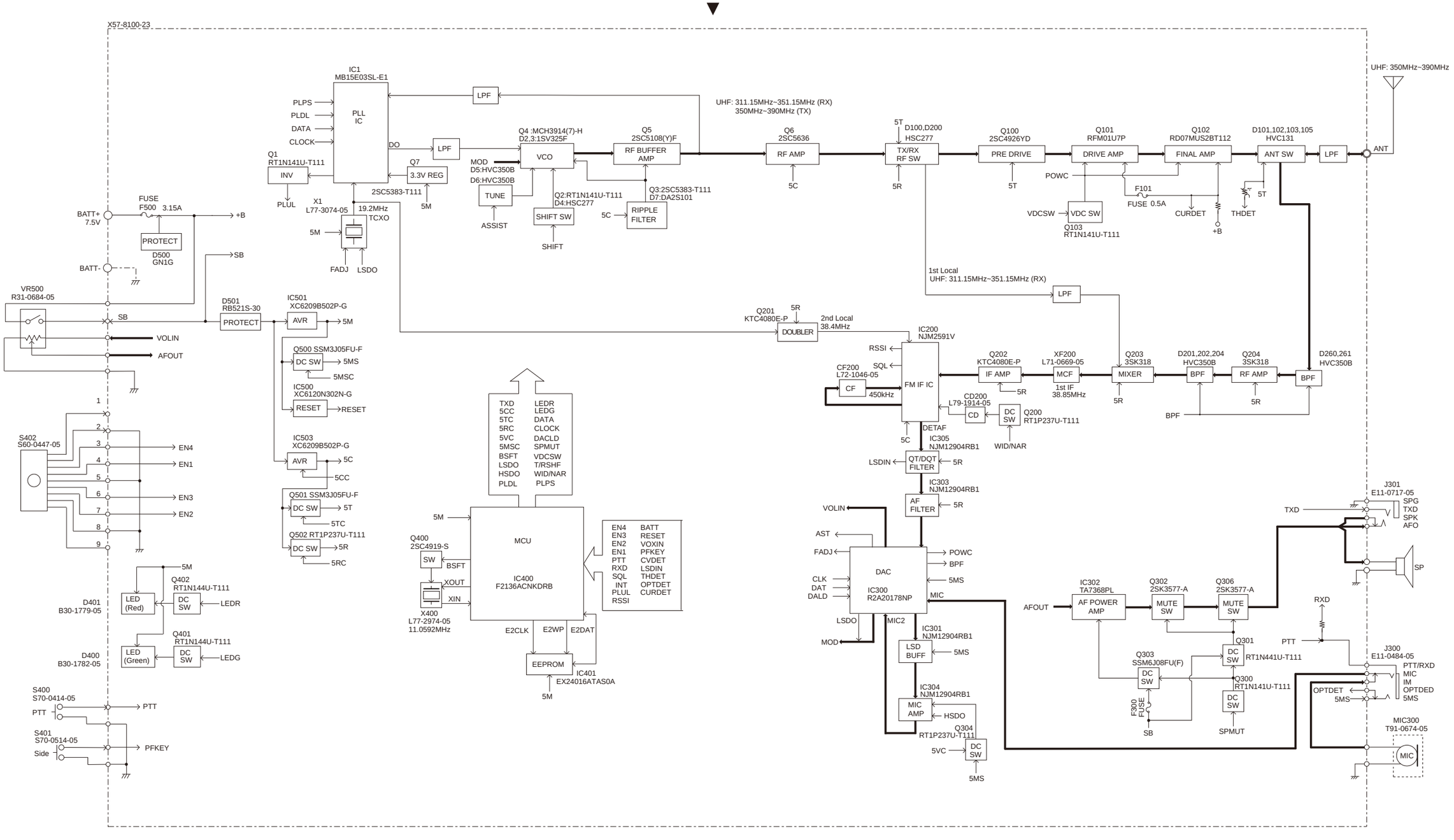
Layer 2

Layer 3

Layer 4

Foil side

TX-RX UNIT (X57-8100-23)


X57-8100-23
IC1
MB15E03SL-E1
PLPS
PLDL
DATA
CLOCK
PLL IC
DO
LPF
Q1
RT1N141U-T111
INV
PLUL
Q7
3.3V REG
2SC5383-T111
5M
X1
L77-3074-05
19.2MHz
TCXO
FADJ
LSDO
Q4 :MCH3914(7)-H
D2,3:1SV325F
VCO
MOD
D5:HVC350B
D6:HVC350B
TUNE
ASSIST
SHIFT SW
SHIFT
Q2:RT1N141U-T111
D4:HSC277
Q5
2SC5108(Y)F
RF BUFFER AMP
Q3:2SC5383-T111
D7:DA2S101
RIPPLE FILTER
5C
UHF: 311.15MHz~351.15MHz (RX)
350MHz~390MHz (TX)
Q6
2SC5636
RF AMP
5T
D100,D200
HSC277
TX/RX RF SW
5R
Q100
2SC4926YD
PRE DRIVE
Q101
RFM01U7P
DRIVE AMP
POWC
Q102
RD07MUS2BT112
FINAL AMP
F101
FUSE 0.5A
CURDET
THDET
+B
D101,102,103,105
HVC131
ANT SW
LPF
ANT
UHF: 350MHz~390MHz
VDCSW
VDC SW
Q103
RT1N141U-T111
FUSE
F500
3.15A
BATT+
7.5V
PROTECT
D500
GN1G
BATT-
SB
VR500
R31-0684-05
VOLIN
AFOUT
D501
RB521S-30
PROTECT
IC501
XC6209B502P-G
AVR
Q500 SSM3J05FU-F
DC SW
5MS
5MSC
IC500
XC6120N302N-G
RESET
IC503
XC6209B502P-G
Q501 SSM3J05FU-F
5TC
Q502 RT1P237U-T111
5RC
1st Local
UHF: 311.15MHz~351.15MHz (RX)
Q201
KTC4080E-P
DOUBLER
2nd Local
38.4MHz
IC200
NJM2591V
RSSI
SQL
CF200
L72-1046-05
CF
450kHz
FM IF IC
Q202
KTC4080E-P
IF AMP
XF200
L71-0669-05
MCF
1st IF
38.85MHz
Q203
3SK318
MIXER
D201,202,204
HVC350B
BPF
Q204
3SK318
RF AMP
D260,261
HVC350B
CD200
L79-1914-05
CD
Q200
RT1P237U-T111
WID/NAR
DETAF
IC305
NJM12904RB1
QT/DQT FILTER
LSDIN
IC303
NJM12904RB1
AF FILTER
VOLIN
AST
FADJ
CLK
DAT
DALD
DAC
IC300
R2A20178NP
POWC
BPF
5MS
MIC
LSDO
MOD
MIC2
IC301
NJM12904RB1
LSD BUFF
IC304
NJM12904RB1
MIC AMP
HSDO
Q304
RT1P237U-T111
5VC
IC302
TA7368PL
AF POWER AMP
AFOUT
Q302
2SK3577-A
MUTE SW
Q306
2SK3577-A
MUTE SW
Q301
RT1N441U-T111
Q303
SSM6J08FU(F)
Q300
RT1N141U-T111
F300
FUSE
SB
SPMUT
RXD
PTT
J301
E11-0717-05
SPG
TXD
SPK
AFO
SP
J300
E11-0484-05
PTT/RXD
MIC
IM
OPTDED
5MS
OPTDET
MIC300
T91-0674-05
MIC
S402
S60-0447-05
EN4
EN1
EN3
EN2
S400
S70-0414-05
PTT
S401
S70-0514-05
Side
PFKEY
D401
B30-1779-05
LED (Red)
Q402
RT1N144U-T111
LEDR
D400
B30-1782-05
LED (Green)
Q401
RT1N144U-T111
LEDG
TXD
LEDR
5CC
LEDG
5TC
CLOCK
5RC
DATA
5VC
DACLD
5MSC
SPMUT
BSFT
VDCSW
LSDO
T/RSHF
HSDO
WID/NAR
PLDL
PLPS
MCU
IC400
F2136ACNKDRB
Q400
2SC4919-S
SW
BSFT
XOUT
XIN
X400
L77-2974-05
11.0592MHz
EN4
EN3
EN2
EN1
PTT
RXD
INT
PLUL
RSSI
BATT
RESET
VOXIN
PFKEY
CVDET
LSDIN
THDET
OPTDET
CURDET
E2CLK
E2WP
E2DAT
EEPROM
IC401
EX24016ATAS0A