UHF FM TRANSCEIVER

TK-3160

SERVICE MANUAL

E · X2 versions

KENWOOD

B51-8674-00 (S) 559

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

CONTENTS

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.

Unit / Model & destination		TX-RX Unit	Frequency range	Remarks
TK-3160	E	X57-6732-71	440~470MHz	IF1 : 49.95MHz LOC : 50.4MHz
TK-3160	X2	X57-6730-72	470~512MHz	IF1 : 49.95MHz LOC : 50.4MHz

PERSONAL SAFETY

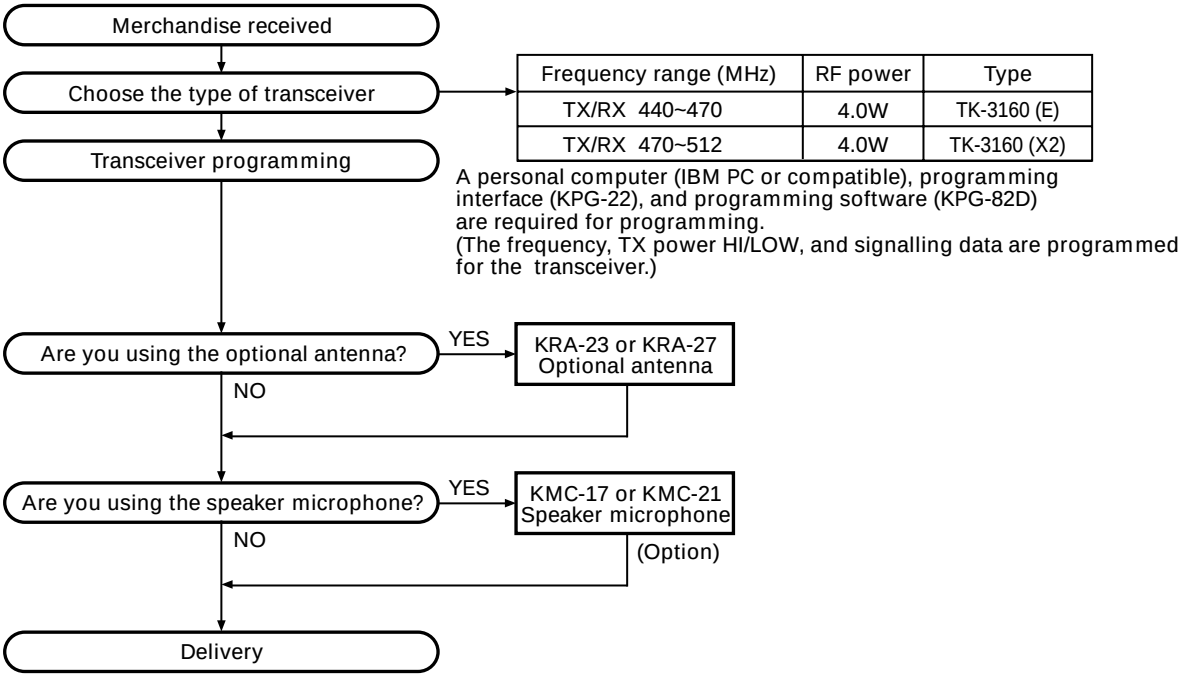
The following precautions are recommended for personal safety:

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

SYSTEM SET-UP



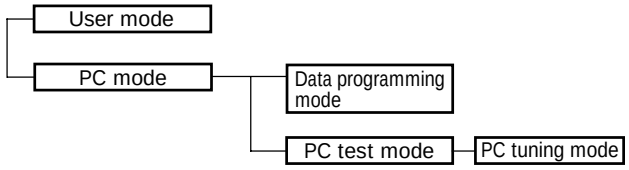
Frequency range (MHz)	RF power	Type
TX/RX 440~470	4.0W	TK-3160 (E)
TX/RX 470~512	4.0W	TK-3160 (X2)

A personal computer (IBM PC or compatible), programming interface (KPG-22), and programming software (KPG-82D) are required for programming.
(The frequency, TX power HI/LOW, and signalling data are programmed for the transceiver.)

REALIGNMENT

REALIGNMENT

1. Modes



Mode	Function
User mode	For normal use.
PC mode	Used for communication between the radio and PC (IBM compatible).
Data programming mode	Used to read and write frequency data and other features to and from the radio.
PC test mode	Used to check the radio using the PC. This feature is included in the KPG-82D.

2. How to Enter Each Mode

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

3.PC Mode

3-1. Preface

The TK-3160 transceiver is programmed using a personal computer, a programming interface (KPG-22) and programming software (KPG-82D).

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 TK-3160 to the personal computer with the interface cable.
2. When the POWER is switched on, user mode can be entered immediately. When the PC sends a command, the radio 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 personal computer must match the model type when it is written into the EEPROM.
- Change the TK-3160 to PC mode, then attach the interface cable.

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

The KPG-22 is required to interface the TK-3160 with the computer. It has a circuit in its D-subconnector (25-pin) case that converts the RS-232C logic level to the TTL level.

The KPG-22 connects the SP/MIC connector of the TK-3160 to the computer's RS-232C serial port.

3-4. Programming software description

KPG-82D is the programming software for TK-3160 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 TK-3160 and edited on the screen. The programmed or edited data can be printed out. It is also possible to tune the transceiver.

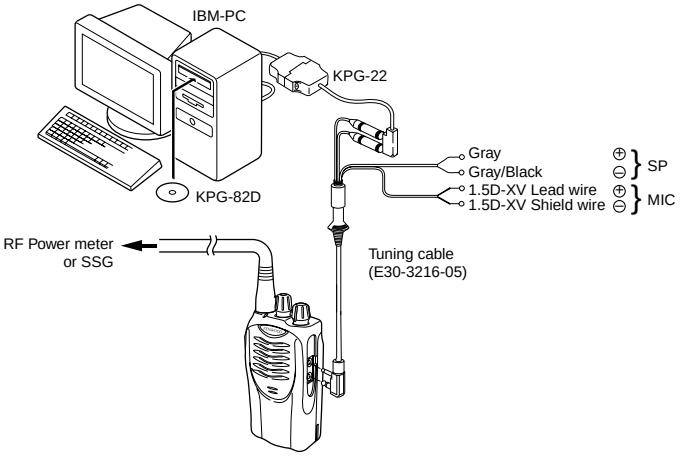


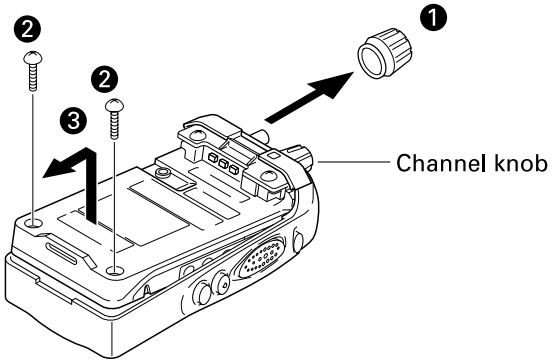
Fig. 1

DISASSEMBLY FOR REPAIR

1. Separating the case assembly from the chassis.

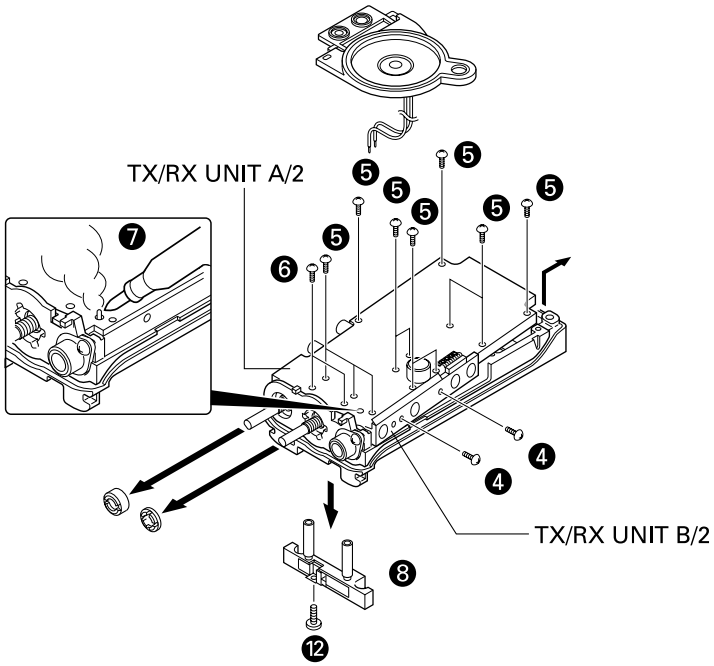
1. Remove the volume knob ❶.
2. Remove the two screws ❷.
3. Lift the chassis ❸, and remove it from the case assembly.

Note: After separating the case assembly from the chassis, remove the channel knob.



2. Separating the chassis from the TX/RX unit.

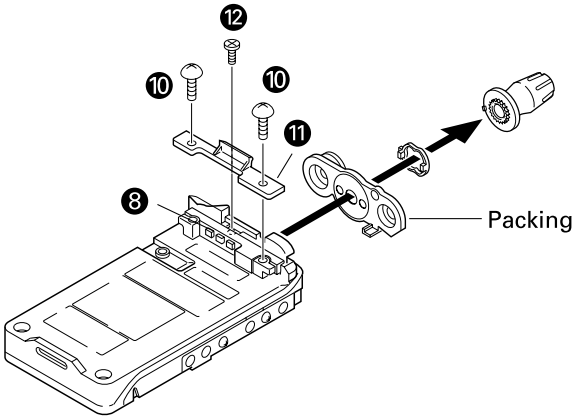
1. Remove the two screws ❹ fixing the TX/RX unit B/2.
2. Remove the twelve screws ❺ and two screws ❻ fixing the TX/RX unit A/2.
3. Remove the solder from the antenna terminal using a soldering iron ❼, then lift the unit off.



Note: The two screws ❻ of TX/RX unit A/2 are fixing the battery terminal block ❽.

3. How to remove the battery terminal block.

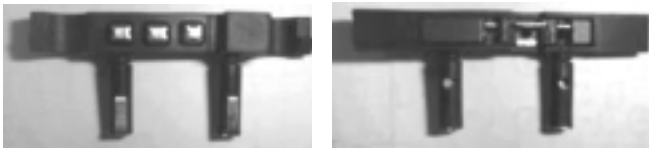
1. Remove the two screws ❿, then pull out the back cover ⓫.
2. Remove the screw ⓬.



DISASSEMBLY FOR REPAIR

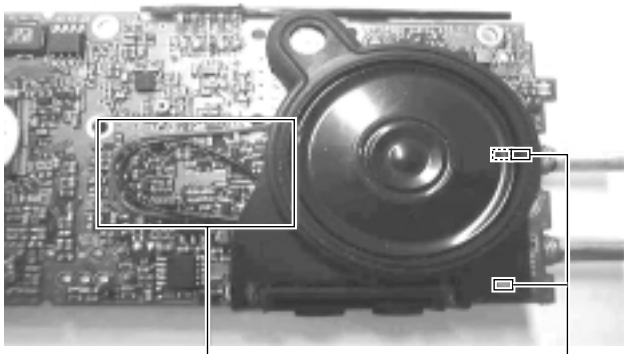
Assembling

- **Installation of battery terminal block and packing**



Install them so that no distortion or deformation occurs.

- **Installation of speakers and cushion, and wire styling of speakers**



Install the speakers so that they do not protrude from the cushion. Perform the wire styling of speakers as shown in a photograph.

- **Attaching the cushion**

Attach the cushion as shown in Fig. 1.

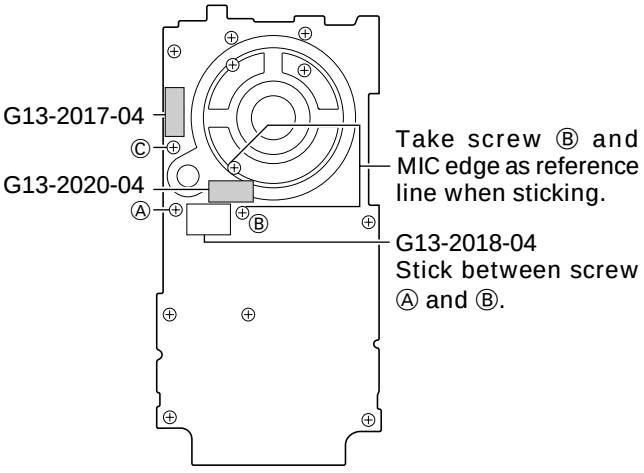
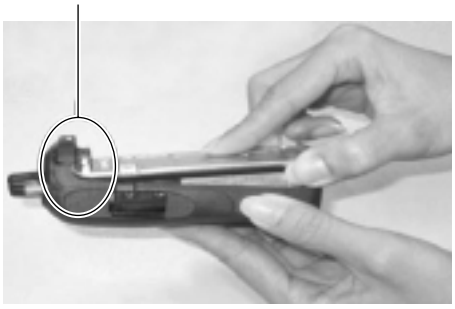


Fig. 1

Note: Cushion must not cover the screws Ⓐ,Ⓑ and Ⓒ.

- **Installation of chassis and cabinet assy**

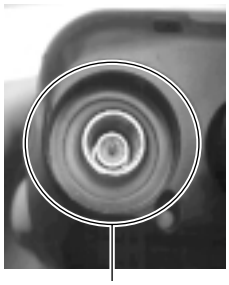
Do not press this area, top packing easily deform.



First, mount the set to the cabinet assy.

Second, press down the Chassis to the cabinet assy as shown in the diagram.

Good Condition

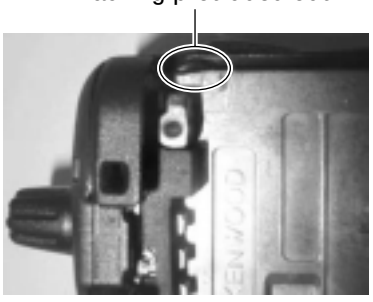


After mount, packing should be in this condition.

NG Condition

Packing deform.

Packing protruded out.



Note:

- Take care that the packing does not protrude from the chassis or case.
- Replace the protruded or deformed packing with a new one.

CIRCUIT DESCRIPTION

1. Frequency Configuration

The receiver utilizes double conversion. The first IF is 49.95 MHz and the second IF is 450 kHz. The first local oscillator signal is supplied from the PLL circuit.

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

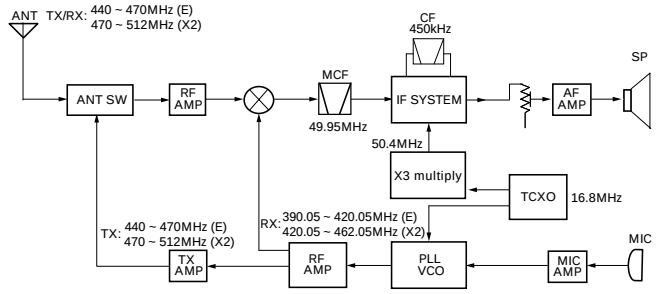


Fig. 1 Frequency configuration

2. Receiver

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

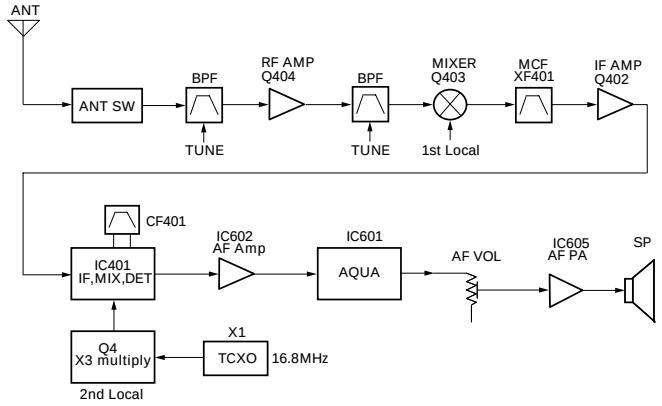


Fig. 2 Receiver section

1) Front End (RF AMP)

The signal coming from the antenna passes through the transmit/receive switching diode circuit, (D204,D206,D208 and D212) passes through a BPF (L413 and L414), and is amplified by the RF amplifier (Q404).

The resulting signal passes through a BPF (L409,L408 and 407) and goes to the mixer. These BPFs are adjusted by variable capacitors (D402,D403,D404,D405 and D406). The input voltage to the variable capacitor is regulated by voltage output from the microprocessor (IC805).

2) First Mixer

The signal from the front end is mixed with the first local oscillator signal generated in the PLL circuit by Q403 to produce a first IF frequency of 49.95 MHz.

The resulting signal passes through the XF401 MCF to cut the adjacent spurious and provide the opitimun characteristics, such as adjacent frequency selectivity.

3) IF Amplifier Circuit

The first IF signal is passed through a four-pole monolithic crystal filter (XF401) 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 (IC401). 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 50.4MHz 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 (CF401) 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 (CD401). The demodulated signal is routed to the audio circuit.

4) Wide/Narrow Switching Circuit

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

The WIDE (low level) and NARROW (high level) data is output from IC805, pin 54.

When a WIDE (low level) data is received, Q401 turn on. When a NARROW (high level) data is received, Q401 turn off.

Q401 turns off/on with the Wide/Narrow data and the IC401 detector output level is switched to maintain a constant output level during wide or narrow signals.

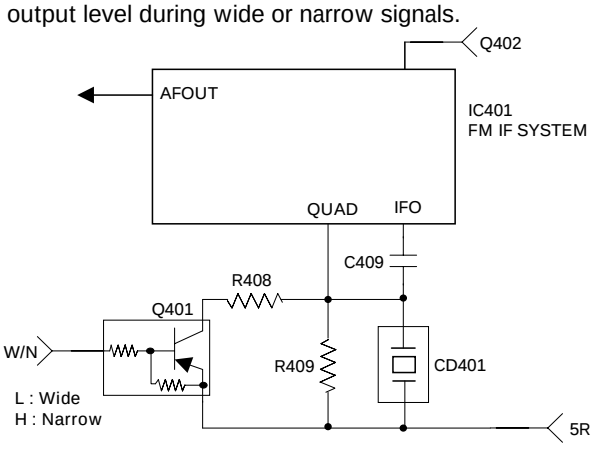


Fig. 3 Wide/Narrow switching circuit

5) Audio Amplifier Circuit

The demodulated signal from IC401 is amplified by IC602, and goes to AF amplifier through IC601.

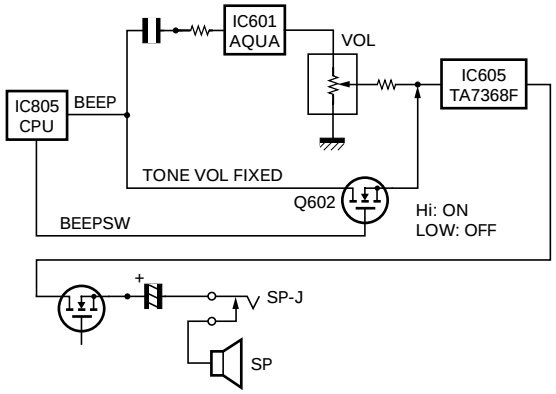
The signal then goes through an AF volume control (VR801), and is routed to an audio power amplifier (IC605) where it is amplified and output to the speaker.

CIRCUIT DESCRIPTION

6) Tone Volume Fixed Circuit

This function generates a TONE signal sound even if the AF volume of the transceiver is the minimum.

A TONE signal is sent through Q602 to the AF amplifier when, in the FPU, "TONE Volume Fixed" is set to ON.



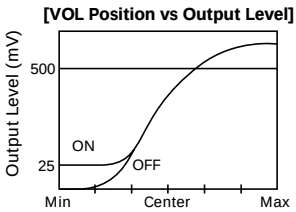


Fig. 4 Tone volume fixed circuit

7) Squelch

Part of the AF signal from the IC enters the FM IC (IC401) again, and the noise component is amplified and rectified by a filter and an amplifier to produce a DC voltage corresponding to the noise level.

The DC signal from the FM IC goes to the analog port of the microprocessor (IC805). IC805 determines whether to output sounds from the speaker by checking whether the input voltage is higher or lower than the preset value.

To output sounds from the speaker, IC805 sends a high signal to the SP MUTE line and turns IC605 on through Q603,Q604,Q607 and Q608. (See Fig. 5)

8) Receive Signalling

(1) QT/DQT

The output signal from IF IC (IC401) enters the microprocessor (IC805) through IC601. IC805 determines whether the QT or DQT matches the preset value, and controls the SP MUTE and the speaker output sounds according to the squelch results.

(2) 5-TONE

Part of the received AF signal output from the AF amplifier IC602, and then pass through an audio processor (IC601), goes to the other AF amplifier IC603, is compared, and then goes to IC805. IC805 checks whether 2-TONE data is necessary. If it matches, IC805 carries out a specified operation, such as turning the speaker on. (See Fig. 5)

(3) MSK (Fleet Sync)

Fleet Sync utilizes 1200bps and 2400bps MSK signal is output from pin 6 of IC601. And is routed to the VCO. When encoding MSK, the microphone input signal is muted.

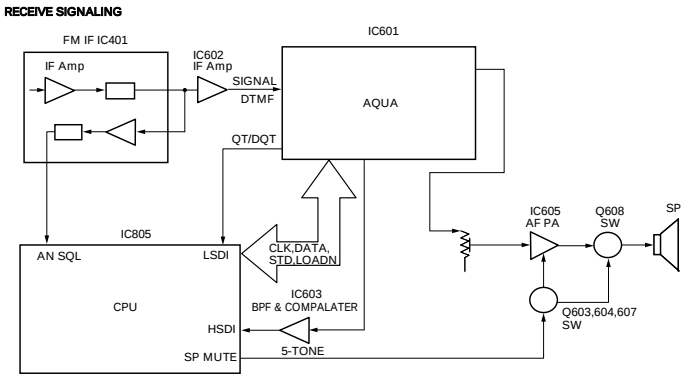


Fig. 5 AF amplifier and squelch

(4) DTMF

The DTMF input signal from the IF IC (IC401) is amplified by IC602 and goes to IC601, the DTMF decoder. The decoded information is then processed by the CPU.

3. PLL Frequency Synthesizer

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

1) PLL

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

A 16.8MHz reference an oscillator signal is divided at IC1 by a fixed counter to produce oscillator (VCO) output signal which is buffer amplified by Q9 then divided in IC1 by a dual-module programmable counter. The divided signal is compared in phase with the 5 or 6.25kHz reference signal from the phase comparator in IC1. The output signal from the phase comparator is filtered through a low-pass filter and passed to the VCO to control the oscillator frequency.(See Fig. 6)

2) VCO

The operating frequency is generated by Q6 in transmit mode and Q5 in receive mode. The oscillator frequency is controlled by applying the VCO control voltage, obtained from the phase comparator, to the varactor diodes (D4 and D7 in transmit mode and D3 and D9 in receive mode). The RX pin is set high in receive mode causing Q8 and Q12 to turn Q6 off and turn Q5 on.

The TX pin is set high in transmit mode. The outputs from Q5 and Q6 are amplified by Q9 and sent to the RF amplifiers.

CIRCUIT DESCRIPTION

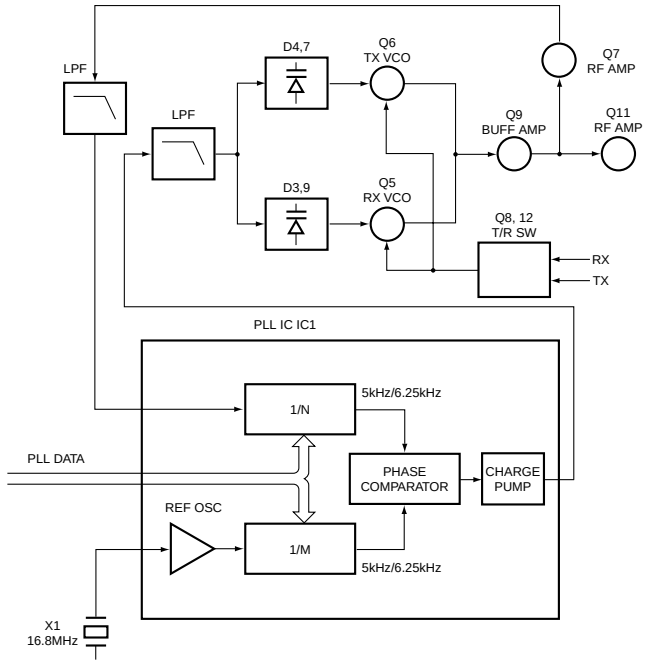


Fig. 6 PLL circuit

3) Unlock Detector

If a pulse signal appears at the LD pin of IC1, an unlock condition occurs, and the DC voltage obtained from C19, R6, and Q1 causes the voltage applied to the microprocessor to go high. When the microprocessor detects this condition, the transmitter is disabled, ignoring the push-to-talk switch input signal.(See Fig. 7)

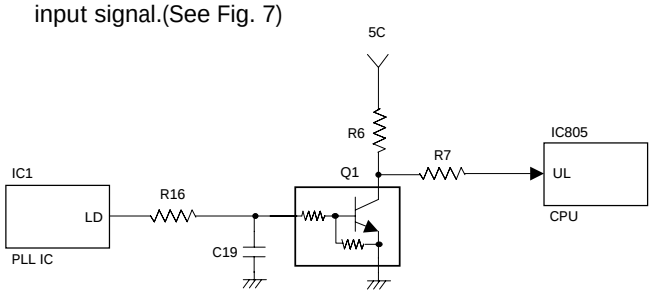


Fig. 7 Unlock detector circuit

4. Transmitter System

1) Microphone Amplifier

The signal from the microphone passes through IC601. When encoding DTMF, it is turned OFF for muting the microphone input signal by IC601.

The signal passes through the Audio processor (IC601) for the maximum deviation adjustment, and goes to the VCXO modulation input.

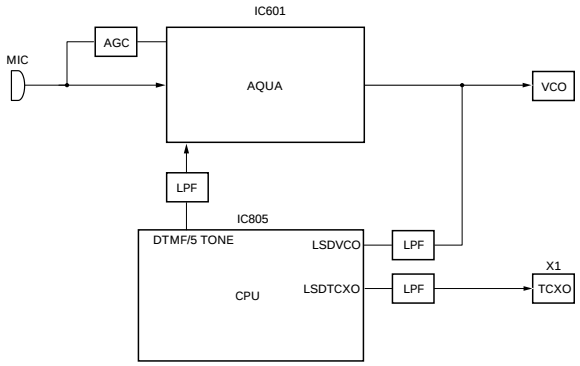


Fig. 8 Microphone amplifier

2) Drive and Final Amplifier

The signal from the T/R switch (D201 is on) is amplified by the pre-drive (Q206) and drive amplifier (Q207) to 50mW. The output of the drive amplifier is amplified by the RF power amplifier (Q211) to 4.0W (1W when the power is low). The RF power amplifier consists of two MOS FET stages. The output of the RF power amplifier is then passed through the harmonic filter (LPF) and antenna switch (D204 and D206) and applied to the antenna terminal.

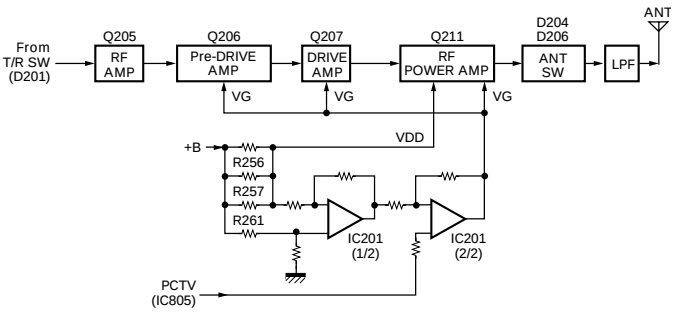


Fig. 9 Drive and final amplifier and APC circuit

3) APC Circuit

The APC circuit always monitors the current flowing through the RF power amplifier (Q211) and keeps a constant current. The voltage drop at R256, R257 and R261 is caused by the current flowing through the RF power amplifier and this voltage is applied to the differential amplifier IC201(1/2). IC201(2/2) compares the output voltage of IC201(1/2) with the reference voltage from IC805. The output of IC201(2/2) controls the VG of the RF power amplifier, Drive amplifier and Pre-Drive amplifier to make both voltages the same. The change of power high/low is carried out by the change of the reference voltage.

4) Encode Signalling

(1) QT/DQT

QT,DQT data of the LSDTCXO Line is output from pin 22 of the CPU. The signal passes through a low-pass CR filter and goes to the TCXO(X1).

The QT,DQT data of the LSDVCO Line is output from pin

CIRCUIT DESCRIPTION

20 of the CPU. The signal passes through a low pass CR filter, mixes with the audio signal, and goes to the VCO modulation input. TX deviation is adjusted by the CPU.

(2) DTMF/5 TONE
High-speed data is output from pin 2 of the CPU. The signal passes through a low-pass CR filter, and provides a TX and SP out tone, and is then applied to the audio processor (IC601). The signal is mixed with the audio signal and goes to the VCO.
TX deviation is adjusted by the CPU.

(3) MSK (Fleet Sync)
The MSK input signal from the IF IC is amplified by IC602 (1/2) and goes to pin 31 of IC 601. The signal is demodulated by MSK demodulator in IC 601. The demodulated data goes to the CPU for processing.

5. Power Supply

There are 3.5V power supply for PLL circuit and five 5V power supplies for the microprocessor: 5M,5MS,5C,5R, and 5T. 5M for microprocessor is always output while the power is on. 5M is always output, but turns off when the power is turned off to prevent malfunction of the microprocessor.

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

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

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

6. Control Circuit

The control circuit consists of a microprocessor (IC805) and its peripheral circuits. It controls the TX-RX unit. IC805 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 (IC805) operates at a clock of 7.3728MHz. This oscillator has a circuit that shifts the frequency by BEAT SHIFT SW (Q810).

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.

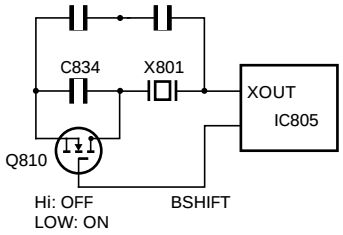


Fig. 10 Frequency shift circuit

2) Memory Circuit

Memory circuit consists of the CPU (IC805) and an EEPROM (IC804). An EEPROM has a capacity of 64k bits that contains the transceiver control program for the CPU and data such as transceiver channels and operating features.

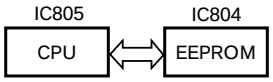


Fig. 11 Memory circuit

3) Low Battery Warning

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

(1) The red LED blinks when the battery voltage falls below the voltage (1) shown in the table during transmission.
(2) The red LED blinks when the battery voltage falls below the voltage (2) shown in the table during transmission.

Note:
The transceiver checks the battery voltage during reception even when, in the FPU, the Battery Warning status function is set to "On TX" (default setting).
However, the LED does not blink during reception. During transmission, the LED blinks to generate the warning tone of a low battery voltage.

(3) The transceiver immediately stops transmission when the battery voltage falls below the voltage (3) shown in the table. A message tone beeps while the PTT switch is released.

	Battery Case	Li-ion Battery	Ni-Cd Battery	Ni-MH Battery
(1)	6.2[V]	6.5[V]	6.2[V]	6.2[V]
(2)	7.5[V]	7.1[V]	6.8[V]	7.0[V]
(3)	5.9[V]	6.2[V]	5.9[V]	5.9[V]

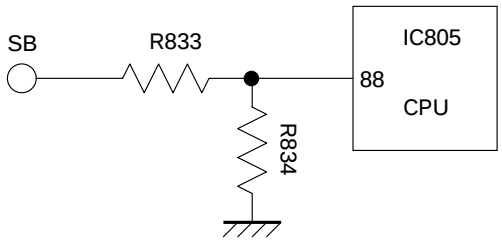


Fig. 12 Low battery warning

CIRCUIT DESCRIPTION / INSTALLATION

4) Battery Type Detection

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

Resistor value	Battery type	Input voltage of S-terminal
1.8MΩ	Li-ion	0.3~1.3V
560kΩ	Ni-Cd	1.3~2.6V
220kΩ	Ni-MH	2.6~5.0V
OPEN	Battery case	0~0.3V

7. Control System

Keys and channel selector circuit.

The signal from keys and channel selector input to microprocessor directly as shown in fig. 13.

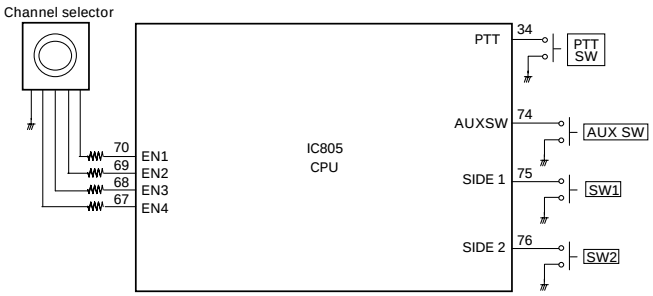


Fig. 13 Control system

INSTALLATION

1. Optional Board

Remove the TX/RX unit from the radio before installing the optional board in the radio.

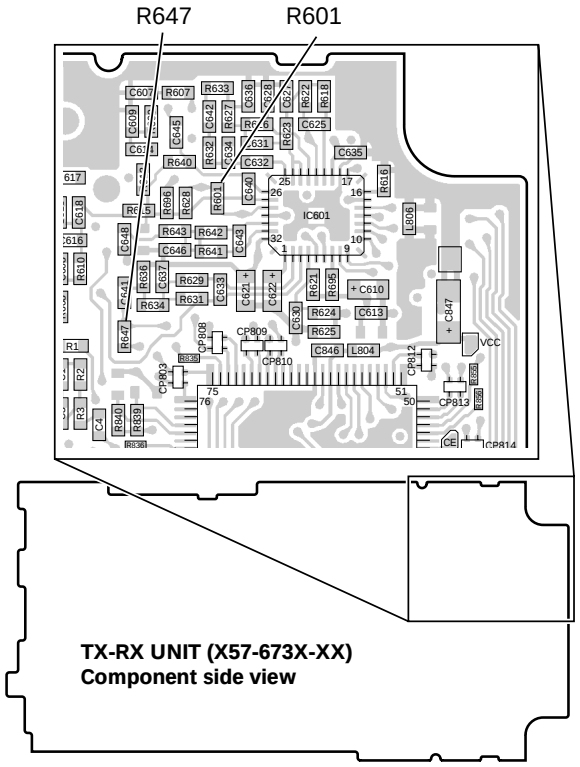
The procedure for removing the TX/RX unit is described in the DISASSEMBLY FOR REPAIR section in the Service Manual.

Install the optional board on the back of the TX/RX unit.

For details on installation of the optional board, refer to Installation Information supplied with the optional board.

When installing the optional board, also refer to the chart in TERMINAL FUNCTION section (page 12) given in the Service Manual.

Note: To install and use the Scrambler Board, remove "R601" and "R647" from the front of the TX/RX unit.



TX-RX UNIT (X57-673X-XX)
Component side view

TERMINAL FUNCTION

■ Solder point connection

Designation	Function	Condition	Value
MIC_I	Mic input	Input sensitivity/Impedance (1kHz std. dev.)	7±3mVrms @22kΩ Load
MIC_O	Mic o utput	Output voltage/Impedance (1kHz 15mVrms mic input)	2.6±1.0mVrms @2.2kΩ Load
		Output voltage/Impedance (1kHz 100mVrms mic input)	90±20mVrms @100kΩ Load
RA_I	Receiver AF input	Input sensitivity/Impedance (1kHz rated AF power/Vol. MAX)	75±20mVrms @22kΩ Load
RA_O	Receiver AF output	Output voltage/Impedance (1kHz std. mod.)	150±50mVrms @2.2kΩ Load
		Output voltage/Impedance (1kHz system mod.)	290±50mVrms @100kΩ Load
A1	AUX1	Load >100kΩ	(Low) Vss ~ 0.4V (High) Vdd-0.8V ~ Vdd
A2	AUX2	Load >100kΩ	(Low) Vss ~ 0.4V (High) Vdd-0.8V ~ Vdd
A3	AUX3	Load >100kΩ	(Low) Vss ~ 0.4V (High) Vdd-0.8V ~ Vdd
A4	AUX4	Load >100kΩ	(Low) Vss ~ 0.4V (High) Vdd-0.8V ~ Vdd
A5	AUX5	Load >100kΩ	(Low) Vss ~ 0.4V (High) Vdd-0.8V ~ Vdd
A6	AUX6	Load >100kΩ	(Low) Vss ~ 0.4V (High) Vdd-0.8V ~ Vdd
SB	Switched B	Output Voltage/7mA load	DC (Battery terminal) ±0.5V
GND	GND		Vss
5C	DC 5V	Output Voltage/10mA load	5.0±0.5V
TXAFI	Transmit AF input	Input sensitivity/Impedance (1kHz std. dev.)	280±50mVrms @22kΩ Load
DEO	Discriminator signal output	Output voltage/Impedance (1kHz std. mod.)	280±50mVrms @2.2kΩ Load
LSDFO	Received sub-tone output	Output voltage/Impedance (150Hz 15% mod.)	180±50mVrms @2.2kΩ Load
ALT	Sidetone input	Input sensitivity/Impedance (1kHz rated AF power/Vol. MAX)	7±3mVrms @22kΩ Load

SEMICONDUCTOR DATA

Microprocessor : M30622MCA8C1GP (TX-RX UNIT : IC805)

■ Pin function

Pin No.	Port Name	I/O	Function
1	PCTV	O	APC/BPF control data output.
2	DTMF	O	DTMF,5TONE.
3	HSDI	I	High speed data input.(5TONE)
4	EEPDAT	I/O	EEPROM data input/output.
5	EEPCLK	O	EEPROM Clock
6	BYTE	I	GND.
7	CNVSS	I	GND.
8	AUX5	O	Option Board 5
9	AUX6	O	Option Board 6
10	RESET	I	CPU reset.
11	XOUT	O	CPU clock.
12	VSS	-	GND.
13	XIN	I	CPU clock.
14	VCC	-	+5V.
15	NC	I	NC
16	INT	I	Battery voltage monitor input Low battery : L
17	RDF/FD	I	Base Band IC Data input
18	TCLK/ DTRDI	I	Base Band IC Data input
19	NC	-	NC
20	LSDVCO	O	Low speed data output. (VCO)
21	NC	I	NC
22	LSDTCXO	O	Low speed data output. (TCXO)
23	NC	I	NC
24	BEEP	O	Beep output.
25	OPTDET	I	Option detect input
26	NC	-	NC
27	NC	-	NC
28	NC	-	NC
29	AUX4	O	Option board port 4
30	AUX2	I/O	Option board port 2
31	NC	-	NC
32	NC	-	NC
33	TXD	I/O	Serial data.
34	PTT/RXD	I	PTT on : L/Serial data.
35	STD	I	Base Band IC Data input
36	BBDIR	O	Base Band IC Data output
37	BBCLK	O	Base Band IC clock output
38	BBDI/O	I/O	Base Band IC Data input/output
39	NC	-	NC
40	TDATA/ DTRCLK	O	Base Band IC Data output
41	DTRLOADN	O	Base Band IC Data output
42	AUX3	O	Option board port 3
43	AUX1	O	Option board port 1
44	NC	-	NC
45	NC	-	NC
46	DSW	O	APC voltage discharge Switch
47	BEEPSW	O	Beep switch.
48	AFCOUT	O	AF amp power supply control
49	AFMUTE	O	RX audio mute
50	NC	-	NC
51	TX	O	TX VCO power supply switch TX:L
52	RX	O	RX VCO power supply switch RX:L

Pin No.	Port Name	I/O	Function
53	BSHIFT	O	Beet shift switch.
54	W/N	O	W/N switch Wide:L
55	NC	-	NC
56	APCSW	O	APC switch output.
57	SAVE	O	Battery save output.
58	5TC	O	5T control output.
59	5RC	O	5R control output.
60	VCC	-	+5V.
61	5MSC	O	5M control output.
62	VSS	-	GND.
63	NC	-	NC
64	NC	-	NC
65	NC	-	NC
66	NC	-	NC
67	EN4	I	CH selector input 4.
68	EN3	I	CH selector input 3.
69	EN2	I	CH selector input 2.
70	EN1	I	CH selector input 1.
71	NC	-	NC
72	LEDTX	O	RED LED lights control output
73	LEDRX	O	GREEN LED lights control output
74	AUXSW	I	Key input.(Emergency)
75	SIDE1	I	Side key 1 input.
76	SIDE2	I	Side key 2 input.
77	NC	-	NC
78	NC	-	NC
79	SIM1	I	Destination select 1.
80	SIM2	I	Destination select 2.
81	NC	-	NC
82	PLLUL	I	PLL unlock detect input. unlock : L
83	RFCLK	O	PLL clock output. Latch : L
84	RFDAT	O	PLL data output.
85	PS	O	PLL power save output.
86	PLLSTB	O	PLL strobe output.
87	BATTSEL	I	Battery distinction input.
88	BATT	I	Battery voltage input.
89	VOX	I	VOX input.
90	RSSQL	I	Received signal strength indicator input.
91	ANSQL	I	Squelch level input.
92	LSDI	I	Low speed data input (QT/DQT).
93	THM	I	Thermistor input.
94	AVSS	-	GND.
95	NC	-	NC
96	VREF	-	+5V.
97	AVCC	-	+5V.
98	NC	-	NC
99	NC	-	NC
100	NC	-	NC

COMPONENTS DESCRIPTION

TX-RX UNIT (X57-673X-XX)

Ref. No.	Use/Function	Operation/Condition
IC1	IC	PLL system
IC201	IC	Comparator (APC)
IC401	IC	FM IF system
IC601	IC	Audio processor
IC602	IC	AF AMP
IC603(1/2)	IC	HSD AMP
IC603(2/2)	IC	HSD AMP
IC604	IC	VOX AMP
IC605	IC	AF power AMP
IC801	IC	Voltage regulator / 5V
IC802	IC	Voltage detector / Reset
IC803	IC	Voltage detector / INT
IC804	IC	EEPROM
IC805	IC	Microprocessor
IC806	IC	Flip Flop
Q1	Transistor	Level shift
Q2	Transistor	Level shift
Q3	Transistor	Level shift
Q4	Transistor	Tripler
Q5	FET	VCO / RX
Q6	FET	VCO / TX
Q7	Transistor	PLL IC f_in AMP
Q8	FET	DC switch / TX VCO
Q9	Transistor	RF Buffer AMP
Q10	Transistor	Ripple filter
Q11	Transistor	RF AMP
Q12	FET	DC switch / RX VCO
Q205	Transistor	Pre-drive AMP
Q206	FET	Pre-drive AMP
Q207	FET	TX Drive AMP
Q208	Transistor	APC switch
Q209	FET	APC switch
Q210	Transistor	APC switch
Q211	FET	TX Final AMP
Q212	FET	APC switch
Q213	Transistor	APC switch
Q401	Transistor	W/N switch
Q402	Transistor	IF AMP
Q403	FET	Mixer
Q404	FET	RF AMP
Q407	FET	DC switch
Q601	FET	AF Mute
Q602	FET	Beep switch
Q603	Transistor	DC switch / SP Mute
Q604	Transistor	DC switch
Q605	Transistor	MIC AGC
Q606	Transistor	MIC AGC
Q607	Transistor	DC switch / SP Mute
Q608	FET	SP Mute switch
Q801	Transistor	5T switch
Q802(1/2)	FET	5TC switch
Q802(2/2)	FET	SAVE switch
Q803(1/2)	Transistor	AVR / 5C
Q803(2/2)	Transistor	AVR / 5T
Q804	Transistor	5C switch
Q805(1/2)	Transistor	LED switch / Green
Q805(2/2)	Transistor	LED switch / Red
Q806	Transistor	AVR / PLLB
Q807	Transistor	PLLB switch
Q808	Transistor	5MS switch
Q809	Transistor	5R switch
Q810	FET	Beet shift switch
D3	Variable capacitance diode	Frequency control / RX VCO
D4	Variable capacitance diode	Frequency control / TX VCO
D7	Variable capacitance diode	Frequency control / TX VCO
D9	Variable capacitance diode	Frequency control / RX VCO
D10	Variable capacitance diode	Modulation
D11	Diode	Current steering
D201	Diode	TX/RX RF switch
D203	Zener diode	APC protect
D204	Diode	ANT switch
D206	Diode	ANT switch
D208	Diode	ANT switch
D212	Diode	ANT switch
D401	Diode	TX/RX RF switch
D402	Variable capacitance diode	RF BPF tuning
D403	Variable capacitance diode	RF BPF tuning
D404	Variable capacitance diode	RF BPF tuning
D405	Variable capacitance diode	RF BPF tuning
D406	Variable capacitance diode	RF BPF tuning
D407	Diode	Rectifier
D603	Diode	Limitter
D604	Diode	Detector
D605	Diode	Detector
D606	Diode	Detector
D801	Diode	5M protect
D802	LED	LED / Red
D803	LED	LED / Green
D805	Diode	Reverse protection

TK-3160

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
Y: AAFES (Europe) **X**: Australia **M**: Other Areas

TK-3160 (Y50-579X-XX)
TX-RX UNIT (X57-673X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
TK-3160					
1	1B		A02-3826-43	CABINET ASSY	
2	2B		A10-4068-31	CHASSIS	
3	3A		A82-0054-02	REAR PANEL	
4	3A		B01-0694-03	ESCUTCHEON	
5	2D		B09-0676-13	CAP ACCESSORY	
6	1C	∗	B62-1788-00	INSTRUCTION MANUAL	E
6	1C	∗	B62-1798-00	INSTRUCTION MANUAL	X2
7	3B	∗	B72-2255-04	MODEL NAME PLATE	E
7	3B	∗	B72-2256-04	MODEL NAME PLATE	X2
8	3A	∗	E04-0446-05	RF COAXIAL RECEPTACLE(SMA)	
10	2A	∗	E37-1101-05	SPEAKER WIRE(RED)	
11	2A	∗	E37-1102-05	SPEAKER WIRE(BLACK)	
12	3A	∗	E72-0416-23	BATT TERMINAL BLOCK	
13	2B	∗	G11-4090-04	SHEET(FINAL FET)	
14	3B	∗	G11-4254-04	SHEET(PTT)	
15	3A	∗	G11-4287-04	SHEET(BATT TERMINAL BLOCK)	
16	3A	∗	G11-4289-04	SHEET(CHASSIS)	
17	3B	∗	G11-4293-04	SHEET	
18	2A	∗	G11-4294-04	SHEET	
19	3B	∗	G11-4295-04	SHEET	
20	1A	∗	G11-4306-04	SHEET	
21	2A	∗	G11-4312-04	SHEET	
22	2B	∗	G13-2001-04	CUSHION(CHASSIS)	
23	2B	∗	G13-2014-04	CUSHION(CHASSIS BOTTOM)	
24	2B	∗	G13-2017-04	CUSHION	
25	2B	∗	G13-2018-04	CUSHION	
26	3A	∗	G13-2019-04	CUSHION	
27	2B	∗	G13-2020-04	CUSHION	
28	3A	∗	G13-2026-04	CUSHION	
29		∗	G13-2027-04	CUSHION	
30	2B	∗	G53-1580-03	PACKING(CHASSIS)	
31	1B	∗	G53-1581-12	PACKING(SPEAKER)	
32	3B	∗	G53-1582-03	PACKING(BATT TERMINAL BLOCK)	
33	3A	∗	G53-1641-02	PACKING	
34	3C	∗	H12-3150-02	PACKING FIXTURE	
35		∗	H25-2345-04	PROTECTION BAG	
36	1D	∗	H52-2000-02	ITEM CARTON CASE	
37		∗	H62-1738-03	OUTER PACKING CASE	
38	2A	∗	J19-5454-03	HOLDER	
39	2D	∗	J21-8464-04	HARDWARE FIXTURE ACCESSORY	
40	2C		J29-0701-05	HOOK ACCESSORY	
41	3A	∗	J30-1275-04	SPACER(CH KNOB)	
42	1A	∗	K29-9278-13	KNOB(VOLUME)	
43	3A	∗	K29-9280-13	KNOB(CH SELECTOR)	
44	1B	∗	K29-9332-03	KNOB(PTT)	
A	3A		N14-0583-04	CIRCULAR NUT(CH)	
B	3A	∗	N14-0805-04	CIRCULAR NUT(VOLUME)	
C	3A		N30-2604-46	PAN HEAD MACHINE SCREW	
D	3B		N30-2612-46	PAN HEAD MACHINE SCREW	
E	3A,3B		N30-3006-45	PAN HEAD MACHINE SCREW	
F	2D		N35-3004-45	BINDING HEAD MACHINE SCREW	
G	3A,3B	∗	N78-2040-46	PAN HEAD TAPTITE SCREW	
H	2A,2B		N83-2005-46	PAN HEAD TAPTITE SCREW	
45	2A	∗	R31-0650-05	VARIABLE RESISTOR	
46	2A		S60-0420-05	ROTARY SWITCH	
47	1B		T07-0369-05	SPEAKER	
TX-RX UNIT (X57-673X-XX) 0-71: X2 2-71: E					
D802			B30-2156-05	LED(RED)	
D803			B30-2157-05	LED(YELLOW)	
C1			CK73GB1H392K	CHIP C 3900PF K	
C2			CK73GB1H471K	CHIP C 470PF K	
C3			CK73GB1H103K	CHIP C 0.010UF K	
C5			CK73GB1H471K	CHIP C 470PF K	
C6			CK73GB1H103K	CHIP C 0.010UF K	
C7			CK73GB1H471K	CHIP C 470PF K	
C8			CC73GCH1H100D	CHIP C 10PF D	
C9			CK73GB1H103K	CHIP C 0.010UF K	
C10			CC73GCH1H100D	CHIP C 10PF D	
C11-13			CC73GCH1H101J	CHIP C 100PF J	
C14			C92-0713-05	CHIP-TAN 10UF 6.3WV	
C15			CK73GB1H102K	CHIP C 1000PF K	
C16			CC73GCH1H470J	CHIP C 47PF J	
C18,19			CK73GB1C104K	CHIP C 0.10UF K	
C20			CC73GCH1H060B	CHIP C 6.0PF B	X2
C22			CK73GB1C104K	CHIP C 0.10UF K	
C24			C92-0713-05	CHIP-TAN 10UF 6.3WV	
C25			CK73GB1H471K	CHIP C 470PF K	
C27			CK73GB1H103K	CHIP C 0.010UF K	
C28			CC73GCH1H560J	CHIP C 56PF J	
C29			CK73GB1H471K	CHIP C 470PF K	
C30			CC73GCH1H220J	CHIP C 22PF J	
C31			CC73GCH1H560J	CHIP C 56PF J	
C32			C92-0002-05	CHIP-TAN 0.22UF 35WV	
C33			CC73GCH1H470J	CHIP C 47PF J	
C34			CK73GB1H471K	CHIP C 470PF K	
C35			CC73GCH1H680J	CHIP C 68PF J	
C36			C92-0585-05	CHIP-TAN 4.7UF 16WV	
C37			CK73GB1H103K	CHIP C 0.010UF K	
C38,39			C92-0002-05	CHIP-TAN 0.22UF 35WV	
C40			CK73GB1H183K	CHIP C 0.018UF K	
C41,42			CK73GB1A105K	CHIP C 1.0UF K	
C43,44			CC73HCH1H101J	CHIP C 100PF J	
C45			CC73HCH1H020B	CHIP C 2.0PF B	E
C45			CC73HCH1H040B	CHIP C 4.0PF B	X2
C46			CC73HCH1H220J	CHIP C 22PF J	E
C46			CC73HCH1H390J	CHIP C 39PF J	X2
C47			CK73GB1H471K	CHIP C 470PF K	
C48			CC73HCH1H150J	CHIP C 15PF J	
C49			CC73HCH1H330J	CHIP C 33PF J	E
C49			CC73HCH1H470J	CHIP C 47PF J	X2
C50			CC73HCH1H020C	CHIP C 2.0PF C	X2

PARTS LIST

TX-RX UNIT (X57-673X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
C50			CC73HCH1H070D	CHIP C 7.0PF D	E
C51			CC73HCH1H180J	CHIP C 18PF J	E
C51			CC73HCH1H220J	CHIP C 22PF J	X2
C52			CC73GCH1H050C	CHIP C 5.0PF C	
C53			CC73HCH1H030B	CHIP C 3.0PF B	X2
C53			CC73HCH1H040B	CHIP C 4.0PF B	E
C54			CC73HCH1H030C	CHIP C 3.0PF C	
C55,56			CC73HCH1H010B	CHIP C 1.0PF B	
C57			CC73GCH1H030C	CHIP C 3.0PF C	
C58			CC73HCH1H040B	CHIP C 4.0PF B	X2
C58			CC73HCH1H050B	CHIP C 5.0PF B	E
C59			CC73GCH1H050C	CHIP C 5.0PF C	
C60			CC73HCH1H040B	CHIP C 4.0PF B	
C61			CK73HB1H471K	CHIP C 470PF K	
C62			CC73HCH1H070B	CHIP C 7.0PF B	E
C62			CC73HCH1H090B	CHIP C 9.0PF B	X2
C63			CC73GCH1H100D	CHIP C 10PF D	
C64			CC73HCH1H050B	CHIP C 5.0PF B	
C65			CC73HCH1H101J	CHIP C 100PF J	
C66			CC73HCH1H090B	CHIP C 9.0PF B	X2
C66			CC73HCH1H120J	CHIP C 12PF J	E
C67			CK73HB1H471K	CHIP C 470PF K	
C68			CK73GB1H471K	CHIP C 470PF K	
C69			CC73HCH1H050B	CHIP C 5.0PF B	X2
C69			CC73HCH1H070B	CHIP C 7.0PF B	E
C70			CK73HB1H471K	CHIP C 470PF K	
C71			CC73GCH1H0R5B	CHIP C 0.5PF B	
C72			CC73HCH1H0R5B	CHIP C 0.5PF B	
C73			CK73GB1H471K	CHIP C 470PF K	
C74			CC73HCH1H100D	CHIP C 10PF D	
C75,76			CK73HB1H471K	CHIP C 470PF K	
C77			C92-0713-05	CHIP-TAN 10UF 6.3WV	
C78			CK73HB1H471K	CHIP C 470PF K	
C80			CC73HCH1H070D	CHIP C 7.0PF D	
C82			CC73HCH1H330J	CHIP C 33PF J	
C83-85			CK73HB1H471K	CHIP C 470PF K	
C86			CC73HCH1H070D	CHIP C 7.0PF D	
C92			CK73GB1H471K	CHIP C 470PF K	
C94,95			CK73HB1A104K	CHIP C 0.10UF K	
C201,202			CK73GB1H471K	CHIP C 470PF K	
C205			CK73GB1A224K	CHIP C 0.22UF K	
C223			CK73GB1H471K	CHIP C 470PF K	
C224			CC73GCH1H040C	CHIP C 4.0PF C	X2
C224			CC73GCH1H070D	CHIP C 7.0PF D	E
C226			CK73GB1H471K	CHIP C 470PF K	
C233			CK73GB1H471K	CHIP C 470PF K	
C241			CK73GB1H471K	CHIP C 470PF K	
C242			CC73GCH1H060D	CHIP C 6.0PF D	
C243			CK73GB1C104K	CHIP C 0.10UF K	
C248			CC73GCH1H050C	CHIP C 5.0PF C	E
C249			CC73GCH1H130J	CHIP C 13PF J	
C255			CK73GB1H471K	CHIP C 470PF K	
C258			CK73GB1C104K	CHIP C 0.10UF K	
C280			CC73GCH1H100D	CHIP C 10PF D	X2
C280			CC73GCH1H330J	CHIP C 33PF J E	
C282			CC73GCH1H220J	CHIP C 22PF J E	
C282			CC73GCH1H680J	CHIP C 68PF J X2	
C283			CC73GCH1H100D	CHIP C 10PF D	
C284			CC73GCH1H200J	CHIP C 20PF J	
C286			C92-0565-05	CHIP-TAN 6.8UF 10WV	

Ref. No.	Address	New parts	Parts No.	Description	Destination
C288			CK73GB1A105K	CHIP C 1.0UF K	
C290-293			CK73GB1H471K	CHIP C 470PF K	
C294			CC73GCH1H101J	CHIP C 100PF J	
C295			CC73GCH1H270J	CHIP C 27PF J	X2
C295			CC73GCH1H330J	CHIP C 33PF J	E
C296			CK73GB1H471K	CHIP C 470PF K	
C297			CK73GB1H103K	CHIP C 0.010UF K	
C298			CK73GB1C104K	CHIP C 0.10UF K	
C299			CK73GB1A105K	CHIP C 1.0UF K	
C300			CC73GCH1H180J	CHIP C 18PF J	X2
C300			CC73GCH1H220J	CHIP C 22PF J	E
C301			CK73GB1H103K	CHIP C 0.010UF K	
C308			CC73GCH1H120J	CHIP C 12PF J	X2
C308			CC73GCH1H270J	CHIP C 27PF J	E
C309			CK73GB1H471K	CHIP C 470PF K	
C317			CC73GCH1H150J	CHIP C 15PF J	X2
C326			CK73GB1H471K	CHIP C 470PF K	
C341			CC73GCH1H3R5B	CHIP C 3.5PF B	E
C349			CC73GCH1H060B	CHIP C 6.0PF B	X2
C349			CC73GCH1H070B	CHIP C 7.0PF B	E
C351			CC73GCH1H150J	CHIP C 15PF J	X2
C351			CC73GCH1H270J	CHIP C 27PF J	E
C352			CK73GB1H471K	CHIP C 470PF K	
C353			CC73GCH1H040B	CHIP C 4.0PF B	
C355			CC73GCH1H050B	CHIP C 5.0PF B	
C356			CC73GCH1H101J	CHIP C 100PF J	E
C356			CK73GB1H471K	CHIP C 470PF K	X2
C358			CC73GCH1H030B	CHIP C 3.0PF B	
C359			CC73GCH1H1R5B	CHIP C 1.5PF B	
C360			CC73GCH1H060B	CHIP C 6.0PF B	X2
C360			CC73GCH1H3R5B	CHIP C 3.5PF B	E
C361			CC73GCH1H020B	CHIP C 2.0PF B	X2
C361			CC73GCH1H2R5B	CHIP C 2.5PF B	E
C363			CC73GCH1H060B	CHIP C 6.0PF B	X2
C363			CC73GCH1H4R5B	CHIP C 4.5PF B	E
C364			CC73GCH1H0R5B	CHIP C 0.5PF B	X2
C364			CC73GCH1H020B	CHIP C 2.0PF B	E
C365			CC73GCH1H020B	CHIP C 2.0PF B	X2
C368			CC73GCH1H050B	CHIP C 5.0PF B	X2
C368			CC73GCH1H100D	CHIP C 10PF D	E
C371			CC73GCH1H010B	CHIP C 1.0PF B	
C372			CK73GB1H471K	CHIP C 470PF K	
C401			CK73GB1H182K	CHIP C 1800PF K	
C402,403			CC73GCH1H331J	CHIP C 330PF J	
C405			CC73GCH1H390J	CHIP C 39PF J	
C406			C92-0713-05	CHIP-TAN 10UF 6.3WV	
C407			CK73GB1H103K	CHIP C 0.010UF K	
C408			CK73GB1C104K	CHIP C 0.10UF K	
C409			CC73GCH1H680J	CHIP C 68PF J	
C410			CK73GB1H471K	CHIP C 470PF K	
C411-413			CK73GB1C104K	CHIP C 0.10UF K	
C414			CC73GCH1H100D	CHIP C 10PF D	
C415			CK73GB1H471K	CHIP C 470PF K	
C416,417			CK73GB1H103K	CHIP C 0.010UF K	
C418			CK73GB1H471K	CHIP C 470PF K	
C419			CC73GCH1H010B	CHIP C 1.0PF B	
C420			CK73GB1C104K	CHIP C 0.10UF K	
C421			CC73GCH1H080B	CHIP C 8.0PF B	
C422			CK73GB1H103K	CHIP C 0.010UF K	
C424			CK73GB1H103K	CHIP C 0.010UF K	

PARTS LIST

TX-RX UNIT (X57-673X-XX)

Ref. No.	Address	New parts	Parts No.	Description			Destination
C425			CC73GCH1H060D	CHIP C	6.0PF	D	
C426			CC73GCH1H020B	CHIP C	2.0PF	B	
C427			CC73GCH1H100D	CHIP C	10PF	D	X2
C427			CC73GCH1H120J	CHIP C	12PF	J	E
C428			CK73GB1H471K	CHIP C	470PF	K	
C429			CC73GCH1H120J	CHIP C	12PF	J	E
C429			CC73GCH1H150J	CHIP C	15PF	J	X2
C430			CK73GB1H471K	CHIP C	470PF	K	
C431			CK73GB1H103K	CHIP C	0.010UF	K	
C432			CK73GB1H471K	CHIP C	470PF	K	
C434			CC73GCH1H050B	CHIP C	5.0PF	B	
C435			CK73GB1H471K	CHIP C	470PF	K	
C439			CK73GB1H471K	CHIP C	470PF	K	
C445			CC73GCH1H040B	CHIP C	4.0PF	B	E
C445			CC73GCH1H4R5B	CHIP C	4.5PF	B	X2
C447			CC73GCH1H150J	CHIP C	15PF	J	X2
C447			CC73GCH1H330J	CHIP C	33PF	J	E
C448			CC73GCH1H030B	CHIP C	3.0PF	B	E
C448			CC73GCH1H1R5B	CHIP C	1.5PF	B	X2
C456			CK73HB1H471K	CHIP C	470PF	K	
C464			CC73GCH1H1R5B	CHIP C	1.5PF	B	X2
C464			CC73GCH1H2R5B	CHIP C	2.5PF	B	E
C465			CC73GCH1H010B	CHIP C	1.0PF	B	E
C465			CC73GCH1H060B	CHIP C	6.0PF	B	X2
C466			CC73GCH1H150J	CHIP C	15PF	J	X2
C466			CC73GCH1H330J	CHIP C	33PF	J	E
C467			CK73HB1H471K	CHIP C	470PF	K	
C468			CC73GCH1H020B	CHIP C	2.0PF	B	
C469			CC73GCH1H030B	CHIP C	3.0PF	B	E
C469			CC73GCH1H1R5B	CHIP C	1.5PF	B	X2
C470			CK73HB1H471K	CHIP C	470PF	K	
C471			CC73GCH1H150J	CHIP C	15PF	J	X2
C471			CC73GCH1H330J	CHIP C	33PF	J	E
C472			C92-0714-05	CHIP-TAN	4.7UF	6.3WV	
C473			CC73HCH1H050B	CHIP C	5.0PF	B	X2
C473			CC73HCH1H060B	CHIP C	6.0PF	B	E
C474,475			CK73GB1H471K	CHIP C	470PF	K	
C478,479			CK73HB1H471K	CHIP C	470PF	K	
C481			CK73GB1H471K	CHIP C	470PF	K	E
C481,482			CK73GB1H471K	CHIP C	470PF	K	X2
C482			CC73GCH1H120G	CHIP C	12PF	G	E
C483			CC73GCH1H040B	CHIP C	4.0PF	B	E
C483			CC73GCH1H050B	CHIP C	5.0PF	B	X2
C484			CC73GCH1H150J	CHIP C	15PF	J	X2
C484			CC73GCH1H330J	CHIP C	33PF	J	E
C485			CC73GCH1H030B	CHIP C	3.0PF	B	
C487			CK73GB1H471K	CHIP C	470PF	K	
C488			CC73GCH1H030B	CHIP C	3.0PF	B	E
C488			CC73GCH1H2R5B	CHIP C	2.5PF	B	X2
C489			CC73GCH1H150J	CHIP C	15PF	J	X2
C489			CC73GCH1H330J	CHIP C	33PF	J	E
C490			CC73GCH1H080B	CHIP C	8.0PF	B	X2
C491			CC73GCH1H100D	CHIP C	10PF	D	E
C491			CC73GCH1H330J	CHIP C	33PF	J	X2
C492			CC73GCH1H3R5B	CHIP C	3.5PF	B	
C493			CK73GB1H471K	CHIP C	470PF	K	
C494			CK73GB1H103K	CHIP C	0.010UF	K	
C495			CC73GCH1H010C	CHIP C	1.0PF	C	
C501			CK73GB1H471K	CHIP C	470PF	K	
C503			CC73HCH1H1R5B	CHIP C	1.5PF	B	X2

Ref. No.	Address	New parts	Parts No.	Description			Destination
C504			CK73HB1H471K	CHIP C	470PF	K	
C506			CK73GB1A105K	CHIP C	1.0UF	K	
C507			CK73GB0J225K	CHIP C	2.2UF	K	
C508			CK73GB1H471K	CHIP C	470PF	K	
C601			CK73GB1A224K	CHIP C	0.22UF	K	
C605			C92-0632-05	CHIP-TAN	6.8UF	6.3WV	
C607			CK73GB1H103K	CHIP C	0.010UF	K	
C608			CK73GB1H392K	CHIP C	3900PF	K	
C609			CK73GB1H103K	CHIP C	0.010UF	K	
C610			C92-0714-05	CHIP-TAN	4.7UF	6.3WV	
C611			CK73GB1A105K	CHIP C	1.0UF	K	
C613-615			CK73GB1C104K	CHIP C	0.10UF	K	
C616			CK73GB1H332K	CHIP C	3300PF	K	
C618			CK73GB1C104K	CHIP C	0.10UF	K	
C619			CK73GB1H392K	CHIP C	3900PF	K	
C621,622			C92-0714-05	CHIP-TAN	4.7UF	6.3WV	
C624			CK73GB1C104K	CHIP C	0.10UF	K	
C625			CC73GCH1H680J	CHIP C	68PF	J	
C627			CK73GB1E123K	CHIP C	0.012UF	K	
C628			CK73GB1H222K	CHIP C	2200PF	K	
C629			CK73GB1C104K	CHIP C	0.10UF	K	
C630			CC73GCH1H101J	CHIP C	100PF	J	
C631			CK73GB1E123K	CHIP C	0.012UF	K	
C632			CK73GB1C104K	CHIP C	0.10UF	K	
C633			CC73GCH1H020B	CHIP C	2.0PF	B	
C634			CK73GB1H102K	CHIP C	1000PF	K	
C635			CK73GB1C104K	CHIP C	0.10UF	K	
C636			CK73GB1C683K	CHIP C	0.068UF	K	
C637			CC73GCH1H101J	CHIP C	100PF	J	
C638			CK73GB1H471K	CHIP C	470PF	K	
C639			CC73GCH1H470J	CHIP C	47PF	J	
C640			CC73GCH1H101J	CHIP C	100PF	J	
C641,642			CK73GB1C104K	CHIP C	0.10UF	K	
C643			CC73GCH1H680J	CHIP C	68PF	J	
C645			CK73GB0J225K	CHIP C	2.2UF	K	
C646			CK73GB1H821K	CHIP C	820PF	K	
C647			CK73GB1H471K	CHIP C	470PF	K	
C648,649			CK73GB1C104K	CHIP C	0.10UF	K	
C650			C92-0713-05	CHIP-TAN	10UF	6.3WV	
C652			CK73GB1H471K	CHIP C	470PF	K	
C653			CK73GB1A224K	CHIP C	0.22UF	K	
C654			CK73GB1H103K	CHIP C	0.010UF	K	
C655			CK73GB1C223K	CHIP C	0.022UF	K	
C656			CK73GB1C104K	CHIP C	0.10UF	K	
C657			CC73GCH1H470J	CHIP C	47PF	J	
C658			CK73GB1C104K	CHIP C	0.10UF	K	
C659			CK73GB1H103K	CHIP C	0.010UF	K	
C660			CK73GB1A105K	CHIP C	1.0UF	K	
C662,663			CK73GB1C104K	CHIP C	0.10UF	K	
C664			CK73GB1H102K	CHIP C	1000PF	K	
C665			CK73GB1H471K	CHIP C	470PF	K	
C667			CK73GB1H471K	CHIP C	470PF	K	
C668			CK73GB1H103K	CHIP C	0.010UF	K	
C669			CK73GB1H471K	CHIP C	470PF	K	
C671			CK73GB1C104K	CHIP C	0.10UF	K	
C672,673			CK73GB1H392K	CHIP C	3900PF	K	
C674			CC73GCH1H221J	CHIP C	220PF	J	
C675,676			C92-0804-05	CHIP-TAN	1.5UF	15WV	
C677			CK73GB1H332K	CHIP C	3300PF	K	
C678			CK73FB1C474K	CHIP C	0.47UF	K	

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Ref. No.	Address	New parts	Parts No.	Description	Destination
C679			CC73GCH1H101J	CHIP C 100PF J	
C680			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C681			CK73GB1C223K	CHIP C 0.022UF K	
C684			CK73GB1C104K	CHIP C 0.10UF K	
C686			CK73GB1C473K	CHIP C 0.047UF K	
C687			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C688			CC73GCH1H221J	CHIP C 220PF J	
C689			CK73GB1C223K	CHIP C 0.022UF K	
C690			CK73GB1H102K	CHIP C 1000PF K	
C691			C92-0665-05	TANTAL 100UF 6.3WV	
C692			CC73GCH1H221J	CHIP C 220PF J	
C693			CK73GB1H471K	CHIP C 470PF K	
C695			CK73GB1H471K	CHIP C 470PF K	
C696			CK73GB1A224K	CHIP C 0.22UF K	
C801			CK73GB1A105K	CHIP C 1.0UF K	
C802			CK73GB1H103K	CHIP C 0.010UF K	
C803,804			CK73GB1A105K	CHIP C 1.0UF K	
C805			CK73GB1H471K	CHIP C 470PF K	
C807			CK73GB1H471K	CHIP C 470PF K	
C809			CK73GB1A105K	CHIP C 1.0UF K	
C811			CK73GB1C104K	CHIP C 0.10UF K	
C812			CK73GB1H103K	CHIP C 0.010UF K	
C814			CK73GB1H103K	CHIP C 0.010UF K	
C816,817			CK73GB1H471K	CHIP C 470PF K	
C818			CK73GB1H103K	CHIP C 0.010UF K	
C819			CK73GB1H471K	CHIP C 470PF K	
C820,821			CK73GB1A105K	CHIP C 1.0UF K	
C822			CK73GB1H471K	CHIP C 470PF K	
C823			CK73GB1H103K	CHIP C 0.010UF K	
C825			C92-0713-05	CHIP-TAN 10UF 6.3WV	
C828			CK73GB1H471K	CHIP C 470PF K	
C830			CK73GB1C104K	CHIP C 0.10UF K	
C833			CK73GB1A105K	CHIP C 1.0UF K	
C834			CK73GB1C104K	CHIP C 0.10UF K	
C835,836			CK73GB1A105K	CHIP C 1.0UF K	
C837			CK73GB1H471K	CHIP C 470PF K	
C840			CK73GB1H471K	CHIP C 470PF K	
C841			CK73GB1H103K	CHIP C 0.010UF K	
C842			CC73GCH1H150J	CHIP C 15PF J	
C843			CC73GCH1H030C	CHIP C 3.0PF C	
C845			CC73GCH1H150J	CHIP C 15PF J	
C846			CK73GB1H103K	CHIP C 0.010UF K	
C847			C92-0712-05	CHIP-TAN 22UF 6.3WV	
C849			CK73GB1H471K	CHIP C 470PF K	
C850			CK73GB1H103K	CHIP C 0.010UF K	
C852,853			CK73GB1H471K	CHIP C 470PF K	
C854			CK73GB1H103K	CHIP C 0.010UF K	
C861			CK73FB1A475K	CHIP C 4.7UF K	
CTC1,2			C05-0384-05	CERAMIC TRIMMER CAP(10PF)	
9	3B	*	E37-1085-05	FLAT CABLE	
J601			E11-0457-05	PHONE JACK (2.5/3.5)	
		*	F20-3352-04	INSULATING SHEET	
F801			F53-0190-05	FUSE	
			G11-4300-04	RUBBER CUSHION	
		*	J99-0374-04	ADHESIVE TAPE	
CD401			L79-1582-05	TUNING COIL	

Ref. No.	Address	New parts	Parts No.	Description	Destination
CF401		*	L72-1015-05	CERAMIC FILTER	
L1			L40-4795-85	SMALL FIXED INDUCTOR(4.7UH)	
L2			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	
L3			L40-1581-86	SMALL FIXED INDUCTOR(0.15UH)	
L5			L92-0138-05	FERRITE CHIP	
L6			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	
L7			L92-0138-05	FERRITE CHIP	
L8			L40-1885-92	SMALL FIXED INDUCTOR(180NH)	
L9			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	
L10			L92-0163-05	BEADS CORE	
L11			L40-1885-92	SMALL FIXED INDUCTOR(180NH)	
L12			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	
L14			L41-1278-14	SMALL FIXED INDUCTOR	X2
L14			L41-1578-14	SMALL FIXED INDUCTOR	E
L15			L41-1578-14	SMALL FIXED INDUCTOR	X2
L15			L41-1878-14	SMALL FIXED INDUCTOR	E
L16			L40-1275-92	SMALL FIXED INDUCTOR(12NH)	
L17,18			L41-2285-03	SMALL FIXED INDUCTOR	
L19			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	
L20,21			L40-3391-86	SMALL FIXED INDUCTOR(3.3UH)	
L22			L92-0163-05	BEADS CORE	
L23			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	X2
L23			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	E
L25			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	
L205			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	
L207			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	
L208			L92-0138-05	FERRITE CHIP	
L209			L40-8265-92	SMALL FIXED INDUCTOR(8.2NH)	
L213			L40-8265-92	SMALL FIXED INDUCTOR(8.2NH)	
L216			L40-1575-54	SMALL FIXED INDUCTOR(15NH)	
L217			L92-0149-05	FERRITE CHIP	
L218			L40-1263-92	SMALL FIXED INDUCTOR(1.2NH)	E
L220			L34-4602-05	AIR-CORE COIL	
L221			L92-0149-05	FERRITE CHIP	
L222			L40-2285-54	SMALL FIXED INDUCTOR(220NH)	
L223			L34-4572-05	AIR-CORE COIL	
L224-226			L34-4564-05	AIR-CORE COIL	
L227			L40-1092-81	SMALL FIXED INDUCTOR	
L401			L92-0138-05	FERRITE CHIP	
L402			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	
L403			L40-5685-85	SMALL FIXED INDUCTOR(0.56UH)	
L404			L40-1585-92	SMALL FIXED INDUCTOR(150NH)	X2
L404			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	E
L405			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	X2
L405			L40-2775-92	SMALL FIXED INDUCTOR(27NH)	E
L407-409			L41-6868-14	SMALL FIXED INDUCTOR	X2
L407-409			L41-8268-14	SMALL FIXED INDUCTOR	E
L410			L92-0138-05	FERRITE CHIP	
L411			L41-2285-03	SMALL FIXED INDUCTOR	
L413,414			L41-6868-14	SMALL FIXED INDUCTOR	X2
L413,414			L41-8268-14	SMALL FIXED INDUCTOR	E
L415			L41-3978-03	SMALL FIXED INDUCTOR	X2
L415			L41-4778-03	SMALL FIXED INDUCTOR	E
L416			L40-5681-86	SMALL FIXED INDUCTOR(0.56UH)	
L601			L92-0140-05	FERRITE CHIP	
L602			L92-0149-05	FERRITE CHIP	
L801			L92-0149-05	FERRITE CHIP	
L802			L92-0140-05	FERRITE CHIP	
L803-807			L92-0138-05	FERRITE CHIP	

PARTS LIST

TX-RX UNIT (X57-673X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
X1			L77-1932-05	TCXO (16.8MHZ)	
X801			L77-1933-05	CRYSTAL RESONATOR(7.3728MHZ)	
XF401			L71-0617-15	MCF (49.95MHZ)	
CP1,2			RK75HA1J473J	CHIP-COM 47K J 1/16W	
CP3,4			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
CP801,802			RK75HA1J473J	CHIP-COM 47K J 1/16W	
CP803-805			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
CP806			RK75HA1J473J	CHIP-COM 47K J 1/16W	
CP807			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
CP808			RK75HA1J472J	CHIP-COM 4.7K J 1/16W	
CP809-818			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
R1			RK73GB1J223J	CHIP R 22K J 1/16W	
R2			RK73GB1J103J	CHIP R 10K J 1/16W	
R3			RK73GB1J474J	CHIP R 470K J 1/16W	
R4			R92-1252-05	CHIP R 0 OHM J 1/16W	
R5			RK73GB1J224J	CHIP R 220K J 1/16W	
R6			RK73GB1J473J	CHIP R 47K J 1/16W	
R7,8			R92-1252-05	CHIP R 0 OHM J 1/16W	
R9			RK73GB1J393J	CHIP R 39K J 1/16W	
R12			RK73GB1J101J	CHIP R 100 J 1/16W	
R13			R92-1252-05	CHIP R 0 OHM J 1/16W	
R14			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R15			R92-1252-05	CHIP R 0 OHM J 1/16W	
R16			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R17			RK73GB1J101J	CHIP R 100 J 1/16W	
R18			RK73GB1J474J	CHIP R 470K J 1/16W	
R19			RK73GB1J100J	CHIP R 10 J 1/16W	
R20,21			R92-1252-05	CHIP R 0 OHM J 1/16W	
R22			RK73GB1J122J	CHIP R 1.2K J 1/16W	
R23,24			RK73GB1J681J	CHIP R 680 J 1/16W	
R25			RK73GB1J103J	CHIP R 10K J 1/16W	
R26			RK73GB1J223J	CHIP R 22K J 1/16W	
R27			RK73GB1J103J	CHIP R 10K J 1/16W	
R28			RK73GB1J393J	CHIP R 39K J 1/16W	
R29			RK73GB1J104J	CHIP R 100K J 1/16W	E
R29			RK73GB1J154J	CHIP R 150K J 1/16W	X2
R30			RK73HB1J333J	CHIP R 33K J 1/16W	
R31			RK73GB1J560J	CHIP R 56 J 1/16W	
R32			RK73HB1J153J	CHIP R 15K J 1/16W	
R33			RK73HB1J473J	CHIP R 47K J 1/16W	
R34			RK73GB1J473J	CHIP R 47K J 1/16W	
R35			RK73GB1J220J	CHIP R 22 J 1/16W	
R36			RK73HB1J100J	CHIP R 10 J 1/16W	
R37			RK73HB1J181J	CHIP R 180 J 1/16W	
R38			RK73HB1J100J	CHIP R 10 J 1/16W	
R39			RK73HB1J151J	CHIP R 150 J 1/16W	
R40			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R41			RK73GB1J154J	CHIP R 150K J 1/16W	
R43			RK73HB1J154J	CHIP R 150K J 1/16W	
R44			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R46			RK73HB1J101J	CHIP R 100 J 1/16W	
R47			RK73HB1J682J	CHIP R 6.8K J 1/16W	
R48			RK73HB1J103J	CHIP R 10K J 1/16W	
R49			RK73GJ1J333D	CHIP R 33K D 1/16W	
R50			RK73HB1J331J	CHIP R 330 J 1/16W	
R51			RK73GJ1J104D	CHIP R 100K D 1/16W	
R55			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R56			RK73HB1J470J	CHIP R 47 J 1/16W	
R57			R92-1368-05	CHIP R 0 OHM	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R58			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R202			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R203			R92-1252-05	CHIP R 0 OHM J 1/16W	
R204			RK73GB1J153J	CHIP R 15K J 1/16W	
R207			RK73GB1J333J	CHIP R 33K J 1/16W	
R215			R92-1252-05	CHIP R 0 OHM J 1/16W	
R222			RK73GB1J331J	CHIP R 330 J 1/16W	
R224			RK73GB1J220J	CHIP R 22 J 1/16W	
R229			RK73GB1J331J	CHIP R 330 J 1/16W	
R230			RK73GB1J180J	CHIP R 18 J 1/16W	
R231,232			RK73GB1J331J	CHIP R 330 J 1/16W	
R234			RK73GB1J103J	CHIP R 10K J 1/16W	
R235			RK73GB1J101J	CHIP R 100 J 1/16W	
R237			RK73GB1J223J	CHIP R 22K J 1/16W	
R242			RK73GB1J124J	CHIP R 120K J 1/16W	
R247			RK73GB1J473J	CHIP R 47K J 1/16W	E
R247			RK73GB1J683J	CHIP R 68K J 1/16W	X2
R251			R92-1252-05	CHIP R 0 OHM J 1/16W	
R252			RK73GB1J220J	CHIP R 22 J 1/16W	
R253			R92-1252-05	CHIP R 0 OHM J 1/16W	
R255			R92-1252-05	CHIP R 0 OHM J 1/16W	
R256,257			RK73EB2ER39K	CHIP R 0.39 K 1/4W	
R258			R92-1252-05	CHIP R 0 OHM J 1/16W	X2
R259			RK73GB1J473J	CHIP R 47K J 1/16W	X2
R259,260			RK73GB1J473J	CHIP R 47K J 1/16W	E
R260			RK73GB1J823J	CHIP R 82K J 1/16W	X2
R261			RK73EB2ER39K	CHIP R 0.39 K 1/4W	
R262			R92-0670-05	CHIP R 0 OHM	
R263			RK73GB1J101J	CHIP R 100 J 1/16W	
R264,265			RK73GH1J154D	CHIP R 150K D 1/16W	
R267-270			RK73GH1J154D	CHIP R 150K D 1/16W	
R271			RK73GB1J103J	CHIP R 10K J 1/16W	
R272			RK73GB1J473J	CHIP R 47K J 1/16W	
R273			R92-1252-05	CHIP R 0 OHM J 1/16W	
R274			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R275			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R276,277			RK73GB1J104J	CHIP R 100K J 1/16W	
R278			R92-0670-05	CHIP R 0 OHM	
R279,280			RK73GB1J271J	CHIP R 270 J 1/16W	
R281,282			R92-1252-05	CHIP R 0 OHM J 1/16W	
R401			RK73GB1J100J	CHIP R 10 J 1/16W	
R403			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R404			RK73GB1J334J	CHIP R 330K J 1/16W	E
R404			RK73GB1J684J	CHIP R 680K J 1/16W	X2
R406			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R407			RK73GB1J474J	CHIP R 470K J 1/16W	
R408			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R409			RK73GB1J392J	CHIP R 3.9K J 1/16W	
R412			RK73GB1J122J	CHIP R 1.2K J 1/16W	E
R412			RK73GB1J331J	CHIP R 330 J 1/16W	X2
R413			RK73GB1J124J	CHIP R 120K J 1/16W	
R414			RK73GB1J681J	CHIP R 680 J 1/16W	
R415			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R416			RK73GB1J101J	CHIP R 100 J 1/16W	
R417			RK73GB1J470J	CHIP R 47 J 1/16W	
R419			RK73GB1J102J	CHIP R 1.0K J 1/16W	X2
R419			RK73GB1J222J	CHIP R 2.2K J 1/16W	E
R420			RK73GB1J151J	CHIP R 150 J 1/16W	
R422			RK73GB1J104J	CHIP R 100K J 1/16W	
R423			RK73GB1J563J	CHIP R 56K J 1/16W	E

PARTS LIST

TX-RX UNIT (X57-673X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R423			RK73GB1J683J	CHIP R 68K J 1/16W	X2
R424			RK73HB1J104J	CHIP R 100K J 1/16W	
R425			RK73GB1J563J	CHIP R 56K J 1/16W	E
R425			RK73GB1J683J	CHIP R 68K J 1/16W	X2
R427			R92-1252-05	CHIP R 0 OHM J 1/16W	
R430,431			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R438			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R440			RK73HB1J221J	CHIP R 220 J 1/16W	
R441			RK73HB1J151J	CHIP R 150 J 1/16W	E
R441			RK73HB1J220J	CHIP R 22 J 1/16W	X2
R457			RK73HB1J104J	CHIP R 100K J 1/16W	
R459			RK73GB1J104J	CHIP R 100K J 1/16W	
R460			RK73GB1J563J	CHIP R 56K J 1/16W	X2
R460			RK73GB1J683J	CHIP R 68K J 1/16W	E
R461			R92-1252-05	CHIP R 0 OHM J 1/16W	
R462,463			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R464			R92-0670-05	CHIP R 0 OHM	
R465			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R469			RK73GB1J221J	CHIP R 220 J 1/16W	
R471			RK73GB1J104J	CHIP R 100K J 1/16W	
R474			RK73GB1J103J	CHIP R 10K J 1/16W	E
R474			RK73GB1J223J	CHIP R 22K J 1/16W	X2
R475			RK73GB1J104J	CHIP R 100K J 1/16W	X2
R475			RK73GB1J683J	CHIP R 68K J 1/16W	E
R476			RK73GB1J103J	CHIP R 10K J 1/16W	
R601			R92-1252-05	CHIP R 0 OHM J 1/16W	
R602			RK73GB1J124J	CHIP R 120K J 1/16W	X2
R602			RK73GB1J184J	CHIP R 180K J 1/16W	E
R603			R92-1252-05	CHIP R 0 OHM J 1/16W	
R604			RK73GB1J184J	CHIP R 180K J 1/16W	
R607-609			RK73GB1J103J	CHIP R 10K J 1/16W	
R610			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R612			RK73GB1J273J	CHIP R 27K J 1/16W	
R613			RK73GB1J824J	CHIP R 820K J 1/16W	
R615			RK73GB1J334J	CHIP R 330K J 1/16W	
R616			R92-1252-05	CHIP R 0 OHM J 1/16W	
R617			RK73GB1J473J	CHIP R 47K J 1/16W	
R618			RK73GJ1J364D	CHIP R 360K D 1/16W	
R621			RK73GB1J473J	CHIP R 47K J 1/16W	
R622			RK73GB1J684J	CHIP R 680K J 1/16W	
R623			RK73GB1J274G	CHIP R 270K G 1/16W	
R624			RK73GB1J562J	CHIP R 5.6K J 1/16W	
R625			RK73GB1J563J	CHIP R 56K J 1/16W	
R626,627			RK73GB1J184J	CHIP R 180K J 1/16W	
R628			RK73GB1J224J	CHIP R 220K J 1/16W	
R629			RK73GB1J394J	CHIP R 390K J 1/16W	
R630			RK73GB1J684J	CHIP R 680K J 1/16W	
R631			RK73GB1J394J	CHIP R 390K J 1/16W	
R632			RK73GB1J823J	CHIP R 82K J 1/16W	
R633			RK73GB1J223J	CHIP R 22K J 1/16W	
R634			RK73GB1J153J	CHIP R 15K J 1/16W	
R636			RK73GB1J474J	CHIP R 470K J 1/16W	
R637			RK73GB1J394J	CHIP R 390K J 1/16W	
R639			RK73GB1J393J	CHIP R 39K J 1/16W	
R640			RK73GB1J184J	CHIP R 180K J 1/16W	
R641,642			RK73GB1J124J	CHIP R 120K J 1/16W	
R643			RK73GB1J184J	CHIP R 180K J 1/16W	
R644,645			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R646			RK73GB1J223J	CHIP R 22K J 1/16W	
R647			R92-1252-05	CHIP R 0 OHM J 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R648			RK73GB1J103J	CHIP R 10K J 1/16W	
R649			RK73GB1J104J	CHIP R 100K J 1/16W	
R650			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R651			R92-1252-05	CHIP R 0 OHM J 1/16W	
R652			RK73GB1J273J	CHIP R 27K J 1/16W	
R653			RK73GB1J392J	CHIP R 3.9K J 1/16W	
R654			RK73GB1J103J	CHIP R 10K J 1/16W	
R655,656			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R657			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R658			RK73GB1J103J	CHIP R 10K J 1/16W	
R660			RK73GB1J154J	CHIP R 150K J 1/16W	
R661			RK73GB1J684J	CHIP R 680K J 1/16W	
R665			R92-1252-05	CHIP R 0 OHM J 1/16W	
R666			RK73GB1J822J	CHIP R 8.2K J 1/16W	
R667			RK73GB1J104J	CHIP R 100K J 1/16W	
R668			RK73GB1J473J	CHIP R 47K J 1/16W	
R669			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R670			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R671			RK73GB1J683J	CHIP R 68K J 1/16W	
R672			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R673			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R674			R92-1252-05	CHIP R 0 OHM J 1/16W	
R675			RK73GB1J822J	CHIP R 8.2K J 1/16W	
R676			RK73GB1J151J	CHIP R 150 J 1/16W	
R677-679			R92-1252-05	CHIP R 0 OHM J 1/16W	
R681			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R682			RK73GB1J100J	CHIP R 10 J 1/16W	
R683			RK73GB1J474J	CHIP R 470K J 1/16W	
R684			RK73GB1J182J	CHIP R 1.8K J 1/16W	
R686			RK73GB1J471J	CHIP R 470 J 1/16W	
R687			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R688,689			RK73GB1J101J	CHIP R 100 J 1/16W	
R691			RK73GB1J333J	CHIP R 33K J 1/16W	
R692			R92-1252-05	CHIP R 0 OHM J 1/16W	
R693			RK73GB1J273J	CHIP R 27K J 1/16W	
R694,695			R92-1252-05	CHIP R 0 OHM J 1/16W	
R696			RK73GB1J103J	CHIP R 10K J 1/16W	
R697			R92-1252-05	CHIP R 0 OHM J 1/16W	
R698			RK73GB1J152J	CHIP R 1.5K J 1/16W	
R802			RK73GB1J101J	CHIP R 100 J 1/16W	
R803,804			R92-1252-05	CHIP R 0 OHM J 1/16W	
R805			RK73GB1J153J	CHIP R 15K J 1/16W	
R807			RK73GB1J103J	CHIP R 10K J 1/16W	
R808			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R809			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R810			RK73GB1J334J	CHIP R 330K J 1/16W	
R811			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R812			RK73GB1J334J	CHIP R 330K J 1/16W	
R813			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R814			RK73GB1J153J	CHIP R 15K J 1/16W	
R815			R92-1252-05	CHIP R 0 OHM J 1/16W	
R816			RK73GB1J224J	CHIP R 220K J 1/16W	
R817			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R818			RK73GB1J821J	CHIP R 820 J 1/16W	
R819			RK73GB1J103J	CHIP R 10K J 1/16W	
R820			RK73GB1J561J	CHIP R 560 J 1/16W	
R821			RK73GB1J331J	CHIP R 330 J 1/16W	
R823			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R824			RK73GB1J183J	CHIP R 18K J 1/16W	
R825			RK73GB1J473J	CHIP R 47K J 1/16W	

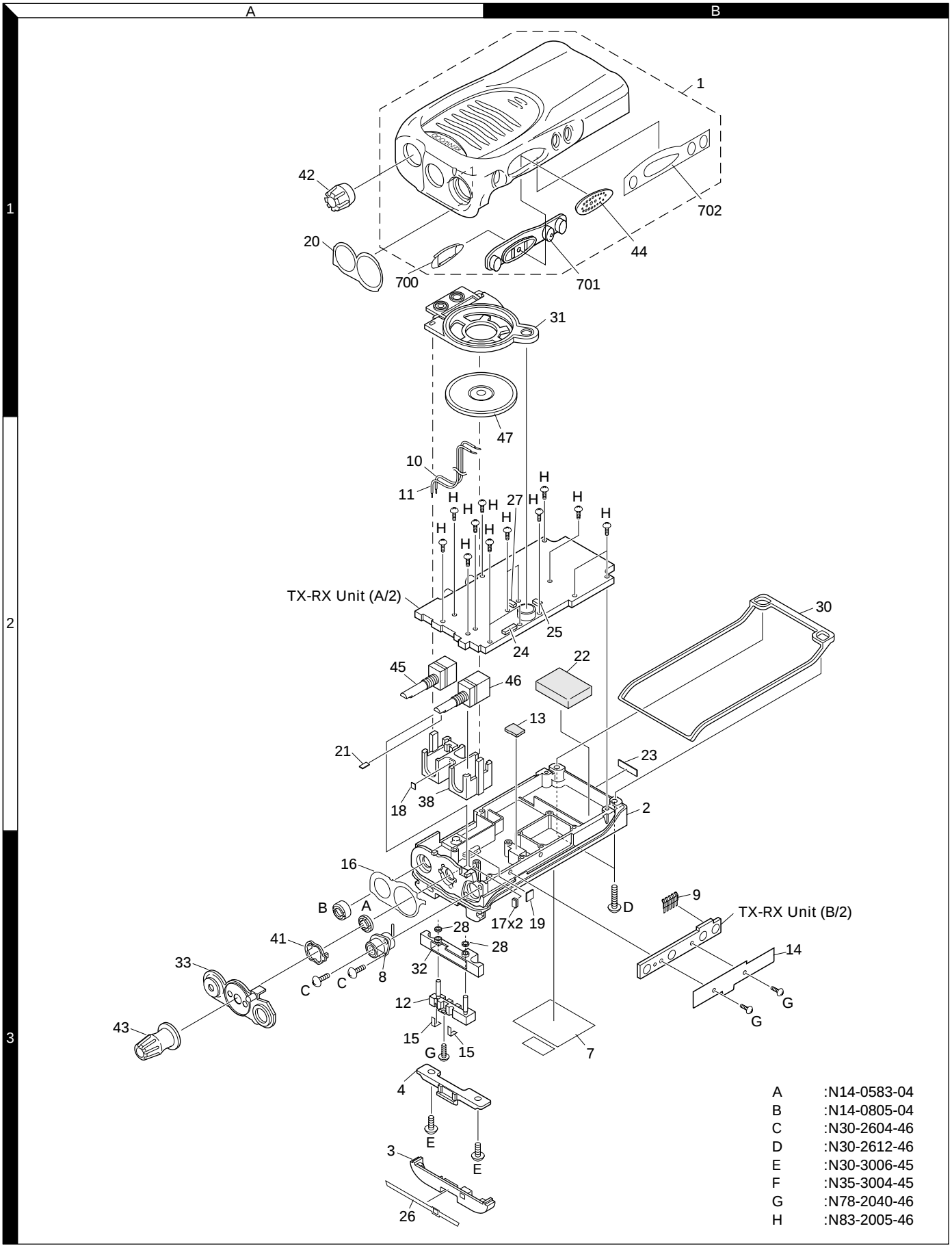
PARTS LIST

TX-RX UNIT (X57-673X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R827			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R828			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R829			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R830			RK73GB1J821J	CHIP R 820 J 1/16W	
R833,834			RK73GH1J474D	CHIP R 470K D 1/16W	
R835,836			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R839,840			RK73GB1J473J	CHIP R 47K J 1/16W	
R841			R92-1252-05	CHIP R 0 OHM J 1/16W	
R842			R92-1368-05	CHIP R 0 OHM	
R844			RK73GB1J473J	CHIP R 47K J 1/16W	
R845			R92-1368-05	CHIP R 0 OHM	
R847,848			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R849			R92-1252-05	CHIP R 0 OHM J 1/16W	
R851			R92-1368-05	CHIP R 0 OHM	
R852			RK73HB1J473J	CHIP R 47K J 1/16W	
R854			RK73GB1J680J	CHIP R 68 J 1/16W	
R855-857			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R858			R92-1368-05	CHIP R 0 OHM	
R859			RK73GB1J104J	CHIP R 100K J 1/16W	
VR1			R12-7491-05	TRIMMING POT.(68K)	
S802-805			S70-0457-05	TACT SWITCH	
MIC60			T91-0543-05	MIC ELEMENT	
D3,4			1SV325	VARIABLE CAPACITANCE DIODE	
D7			1SV325	VARIABLE CAPACITANCE DIODE	
D9			1SV325	VARIABLE CAPACITANCE DIODE	
D10			1SV278	VARIABLE CAPACITANCE DIODE	
D11			HSC277	DIODE	
D201			HSC277	DIODE	
D203			HZU5CLL	ZENER DIODE	
D204			HVC131	DIODE	
D206			HVC131	DIODE	
D208			HVC131	DIODE	
D212			HVC131	DIODE	
D401			HSC277	DIODE	
D402-406			HVC369B	VARIABLE CAPACITANCE DIODE	
D407			RB521S-30	DIODE	
D603-606			RB706F-40	DIODE	
D801			RB521S-30	DIODE	
D805			1SR154-400	DIODE	
IC1			MB15E03SL	MOS IC	
IC201			TA75W01FU	MOS IC	
IC401			TA31136FN	MOS IC	
IC601		*	AQUA	MOS IC	
IC602			TC75S51FE	MOS IC	
IC603			TC75W51FU	MOS IC	
IC604			TC75S51FE	MOS IC	
IC605			TA7368F	MOS IC	
IC801			XC6204B502MR	MOS IC	
IC802		*	PST9134NR	MOS IC	
IC803			XC61CN5002NR	MOS IC	
IC804		*	CAT24WC64JI	ROM IC	
IC805		*	30622MCA-8C1GP	MPU	
IC806			TC7W74FU	MOS IC	
Q1			DTC144EE	DIGITAL TRANSISTOR	
Q2,3			UMG9N	TRANSISTOR	
Q4			KTC4082	TRANSISTOR	
Q5,6			2SK508NV(K52)	FET	

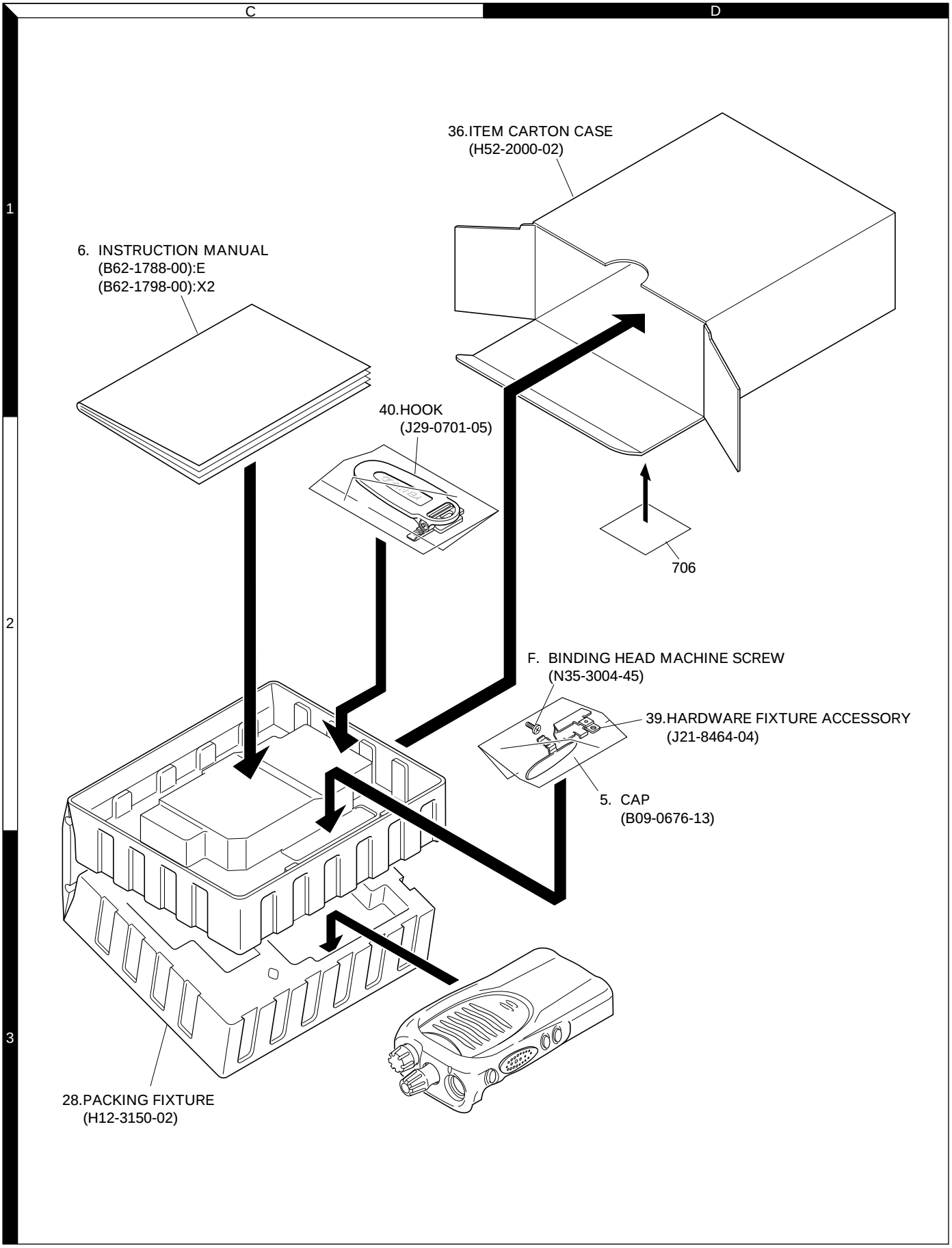
Ref. No.	Address	New parts	Parts No.	Description	Destination
Q7			2SC5108(Y)	TRANSISTOR	
Q8			2SJ347	FET	
Q9			2SC5108(Y)	TRANSISTOR	
Q10			2SC4617(S)	TRANSISTOR	
Q11			2SC5108(Y)	TRANSISTOR	
Q12			2SJ347	FET	
Q205			2SC5108(Y)	TRANSISTOR	
Q206		*	2SK3077	FET	
Q207			2SK2596	FET	
Q208			DTC114EE	DIGITAL TRANSISTOR	
Q209			2SK879(GR)	FET	
Q210			DTC114EE	DIGITAL TRANSISTOR	
Q211			2SK3476	FET	
Q212			2SK1824	FET	
Q213			DTA144EE	DIGITAL TRANSISTOR	
Q401			DTA144EE	DIGITAL TRANSISTOR	
Q402			2SC4649(N,P)	TRANSISTOR	
Q403			3SK318	FET	X2
Q403,404			3SK318	FET	E
Q404			3SK293	FET	X2
Q407,408			2SK1824	FET	
Q601,602			2SK1824	FET	
Q603			DTC144EE	DIGITAL TRANSISTOR	
Q604			2SA1362(GR)	TRANSISTOR	
Q605			2SC4116(Y)	TRANSISTOR	
Q606			2SA1586(Y,GR)	TRANSISTOR	
Q607			DTC144EE	DIGITAL TRANSISTOR	
Q608			2SK1588	FET	
Q801			UMG3N	TRANSISTOR	
Q802			UPA672T	FET	
Q803			FP210	TRANSISTOR	
Q804			UMG3N	TRANSISTOR	
Q805			UMG9N	TRANSISTOR	
Q806			KTA1298(Y)	TRANSISTOR	
Q807			UMG3N	TRANSISTOR	
Q808,809			DTA123JE	DIGITAL TRANSISTOR	
Q810			2SK1824	FET	
TH1			B57331V2104J	THERMISTOR	
TH600			B57331V2104J	THERMISTOR	

EXPLODED VIEW



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

PACKING



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

ADJUSTMENT

Test Equipment Required for Alignment

Test Equipment		Major Specifications	
1.	Standard Signal Generator (SSG)	Frequency Range	400 ~ 512MHz
		Modulation	Frequency modulation and external modulation.
		Output	-127dBm/0.1µV to greater than -47dBm/1mV
2.	Power Meter	Input Impedance	50Ω.
		Operation Frequency	400 ~ 512MHz
		Measurement Range	Vicinity of 10W
3.	Deviation Meter	Frequency Range	400 ~ 512MHz
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.	8Ω Dummy Load		Approx. 8Ω, 3W.
12.	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 radio uses an SMA terminal.

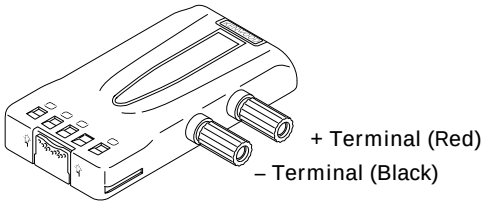
Use an antenna connector adapter [SMA(f) – BNC(f) or SMA(f) – N(f)] for adjustment. (The adapter is not provided as an option, so buy a commercially-available one.)

2. Repair Jig (Chassis)

Use jig (part No.: A10-4082-02) for repairing the TK-3160. 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 (W05-0909-00)

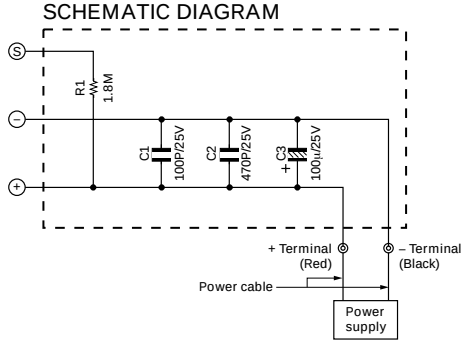


Connect the power cable properly between the battery jig installed in the transceiver and the power supply, and be sure output voltage and the power supply polarity prior to switching the power supply ON, otherwise over voltage and reverse connection may damage the transceiver, or the power supply or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

When using the battery jig in user mode, the transceiver assumes that a lithium-ion battery pack is attached to the transceiver. In adjustment mode, battery type detection is not performed. Refer to page 10 for details.

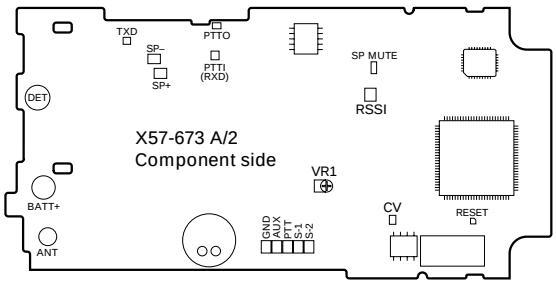
Note: When using the battery jig, you must measure the voltage at the terminals of the battery jig. Otherwise, a slight voltage drop may occur within the power cable, between the power supply and the battery jig, especially while the transceiver transmits.

SCHEMATIC DIAGRAM



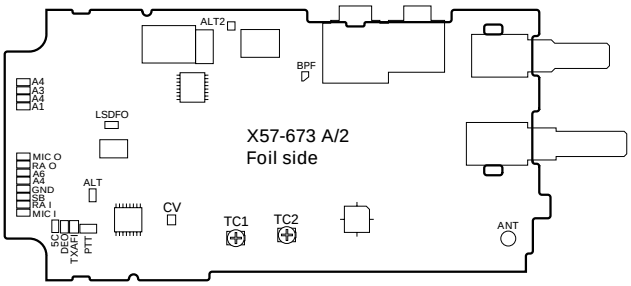
ADJUSTMENT

Adjustment points TX-RX unit (X57-673)
Component side view



VR1 : Frequency adjustment
RSSI : Band-pass wave form test point

Foil Side View



TC1 : Transmit lock voltage adjustment
TC2 : Receive lock voltage adjustment
CV : Lock voltage adjustment terminal.

Fig. 1 Adjustment points

■ Frequency and signalling

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

Frequency (MHz) E type

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

Frequency (MHz) X2 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	——	——

Signalling

Signalling 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 210.7Hz	QT 210.7Hz
6	QT 254.1Hz	QT 254.1Hz
7	DQT D023N	DQT D023N
8	DQT D754I	DQT D754I
9	DTMF 159D	DTMF 159D
10	None	DTMF tone 9
11	5 Tone: CCIR 1, 2, 3, 4, 5	5 Tone: CCIR 1, 2, 3, 4, 5
12	None	Single Tone:1000Hz
13	None	MSK
14	MSK Code	MSK Code

- **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 (E type)

	E	
TEST CH	RX	TX
Center	455.050MHz	455.100MHz
Low	440.050MHz	440.100MHz
High	469.950MHz	469.900MHz
Low'	447.550MHz	447.600MHz
High'	462.550MHz	462.600MHz
	455.000MHz	455.000MHz
	455.200MHz	455.200MHz
	455.400MHz	455.400MHz

Adjustment Frequency (X2 type)

	X2	
TEST CH	RX	TX
Center	491.050MHz	491.100MHz
Low	470.050MHz	470.100MHz
High	511.950MHz	511.900MHz
Low'	480.550MHz	480.600MHz
High'	501.550MHz	501.600MHz
	491.000MHz	491.000MHz
	491.200MHz	491.200MHz
	491.400MHz	491.400MHz

ADJUSTMENT

Common Section

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
1.Setting	1) BATT terminal votage:7.5V 2) SSG standard modulation [Wide 5k] MOD:1kHz,DEV:3kHz [Wide 4k] MOD:1kHz,DEV:2.4kHz [Narrow] MOD:1kHz,DEV:1.5kHz					
2.VCO lock voltage RX	1) CH:High	Power meter DVM	ANT CV	TC2	ADJ	3.5V ±0.2V (X2)
						3.2V ±0.2V (E)
	2) CH:Low				Check	0.6V or more
3.VCO lock voltage TX	3) CH:High PTT:ON			TC1	ADJ	3.5V ±0.2V (X2)
						3.2V ±0.2V (E)
	4) CH:Low PTT:ON				Check	0.6V or more

Transmitter Section

[Wide 4k] is only E market.

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
1.Frequency Adjust [Wide 5k]	1) CH:Center 2) PTT:ON	Frequency counter	ANT	VR1		Center frequency ±50Hz
2.High power Adjust [Wide 5k]	TEST CH: Low Low' Center High' High (5 points) BATT terminal voltage:7.5V PTT:ON	Power meter Ampere meter		Programming Software:KPG-82D		4.0W ±0.1W 2.0 A or less
3.Low power Adjust [Wide 5k]	TEST CH: Low Low' Center High' High (5 points) BATT terminal voltage:7.5V PTT:ON					1.0W ±0.1W 1.0 A or less
4.Max deviation Adjust [Wide 5k]	TEST CH: Low Center High (3 points) AG:1kHz/150mV Dev meter filter LPF:15kHz HPF:OFF PTT:ON	Power meter Dev meter Oscilloscope AG AF VTVM	ANT SP/MIC connector		4.2kHz (According to the lager +,–)	±50Hz
[Wide 4k]	TEST CH: Center PTT:ON				3.4kHz (According to the lager +,–)	±50Hz
[Narrow]					2.1kHz (According to the lager +,–)	±50Hz
5.VOX 1 Writing [Wide 5k]	TEST CH: Center AG:1KHz/60mV	Power meter Dev meter Oscilloscope AG AF VTVM				
6.VOX 10 Writing [Wide 5k]	TEST CH: Center AG:1KHz/4.0mV					

ADJUSTMENT

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
7.DQT TCXO Balance Writing	TEST CH: Center	Power mete Dev meter Oscilloscope AG AF VTVM	ANT	Programming Software:KPG-82D	Write	
[Wide 5k]						200 hex
[Wide 4k]						180 hex
[Narrow]						120 hex
8.DQT VCO Balance Adjust [Wide 5k]	TEST CH: Low Center High (3 points) LPF:3kHz HPF:OFF PTT:ON				Make the demodulation wave into square waves	
[Wide 4k]	TEST CH: Center					
[Narrow]	PTT:ON					
9.QT Deviation Adjust [Wide 5k]	TEST CH: Low Center High (3 points) LPF:3kHz HPF:OFF PTT:ON				0.8kHz	±40Hz
[Wide 4k]	TEST CH:Center				0.6kHz	±40Hz
[Narrow]	PTT:ON				0.4kHz	±40Hz
10.DQT Deviation Adjust [Wide 5k]	TEST CH: Low Center High (3 points) LPF:3kHz HPF:OFF PTT:ON				0.75kHz	±40Hz
[Wide 4k]	TEST CH: Center				0.6kHz	±40Hz
[Narrow]	PTT:ON				0.35kHz	±40Hz
11.Tone Deviation Adjust [Wide 5k]	TEST CH: Center LPF:15kHz HPF:OFF PTT:ON				3.0kHz	±100Hz
[Wide 4k]	TEST CH: Center				2.4kHz	±100Hz
[Narrow]	PTT:ON				1.5kHz	±100Hz
12.DTME Deviation Adjust [Wide 5k]	TEST CH: Center LPF:15kHz HPF:OFF PTT:ON				3.0kHz	±100Hz
[Wide 4k]	TEST CH: Center				2.4kHz	±100Hz
[Narrow]	PTT:ON				1.5kHz	±100Hz
13.MSK Deviation Adjust [Wide 5k]	TEST CH: Low Center High (3 points) LPF:15kHz HPF:OFF PTT:ON				3.0kHz	±100Hz
[Wide 4k]	TEST CH: Center				2.4kHz	±100Hz
[Narrow]	PTT:ON				1.5kHz	±100Hz
14.BATT Detection Writing [Wide 5k]	BATT terminal voltage:5.9V PTT:ON	Power meter DVM	ANT BATT terminal		Write	BATT terminal voltage:5.9V

ADJUSTMENT

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
15.BATT Detection Check	1) BATT terminal voltage:5.5V PTT:ON	Power meter DVM	ANT BATT terminal		Check	LED blinks
	2) BATT terminal voltage:7.5V PTT:ON					LED does not blink

Receiver Section

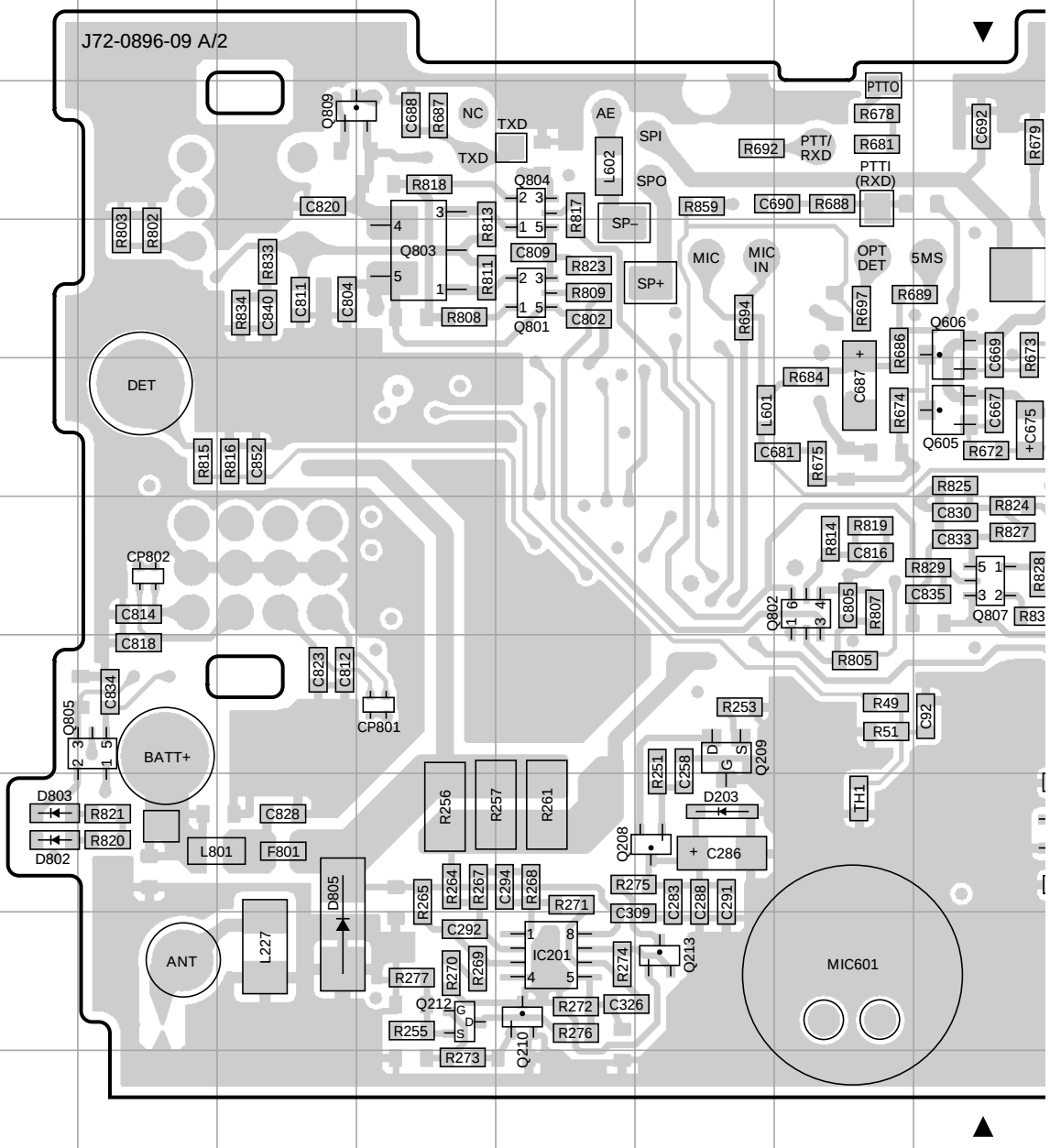
Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
1.BPF Wave form ADJ [Wide 5k]	TEST CH: Low Low' Center High' High (5 points) SSG otuput:–103 dBm(1.58µV)	SSG DVM Oscilloscope AF VTVM	ANT RSSI	Programming Software:KPG-82D	RSSI MAX	
2.Sesitivity check [Wide 5k]	TEST CH:Low Low' Center High' High (5 points) SSG otuput:–117 dBm(0.3µV) SSG MOD:3kHz		ANT		Check	12dB SINAD or more
[Wide 4k]	TEST CH:Center SSG otuput:–117 dBm(0.3µV) SSG MOD:2.4kHz					12dB SINAD or more
[Narrow]	TEST CH:Center SSG otuput:–115 dBm(0.4µV) SSG MOD:1.5kHz					12dB SINAD or more
3.Squelch tight writing [Wide 5k]	TEST CH:Center SSG otuput:–116 dBm(0.35µV) SSG MOD:3.0kHz			Programming Software:KPG-82D		Squelch open
[Wide 4k]	TEST CH:Center SSG otuput:–116 dBm(0.35µV) SSG MOD:2.4kHz					Squelch open
[Narrow]	TEST CH:Center SSG otuput:–115 dBm(0.4µV) SSG MOD:1.5kHz					Squelch open
4. Squelch threshold writing [Wide 5k]	TEST CH:Center SSG otuput:–121 dBm(0.2µV) SSG MOD:3.0kHz					Squelch open
[Wide 4k]	TEST CH:Center SSG otuput:–121 dBm(0.2µV) SSG MOD:2.4kHz					Squelch open
[Narrow]	TEST CH:Center SSG otuput:–120 dBm(0.22µV) SSG MOD:1.5kHz					Squelch open
5.RSSI writing [Wide 5k] [Wide 4k]	TEST CH:Center SSG otuput:–122 dBm(0.18µV) SSG MOD:off					
[Narrow]	TEST CH:Center SSG otuput:–121 dBm(0.2µV) SSG MOD:off					

TK-3160 PC BOARD

TX-RX UNIT (X57-673X-XX) 0-71 : X2 2-71 : E
Component side view (J72-0896-09)

TX-RX UNIT
(X57-673X-XX)

Ref. NO.	Address
IC201	9G
IC601	4Q
IC602	6M
IC603	8M
IC604	6L
IC605	3L
IC802	8K
IC803	8K
IC804	9O
IC805	7Q
IC806	8R
Q1	7O
Q3	8O
Q208	8H
Q209	7H
Q210	9G
Q212	9F
Q213	9H
Q407	6M
Q408	9N
Q601	5M
Q602	2N
Q603	4M
Q604	3M
Q605	5J
Q606	4J
Q607	4M
Q608	4L
Q801	4G
Q802	6I
Q803	4F
Q804	3G
Q805	7D
Q806	6K
Q807	6J
Q809	3E
Q810	9R
D203	8H
D407	6M
D603	5M
D604	7K
D605	5K
D606	5K
D802	8C
D803	8C
D805	9E



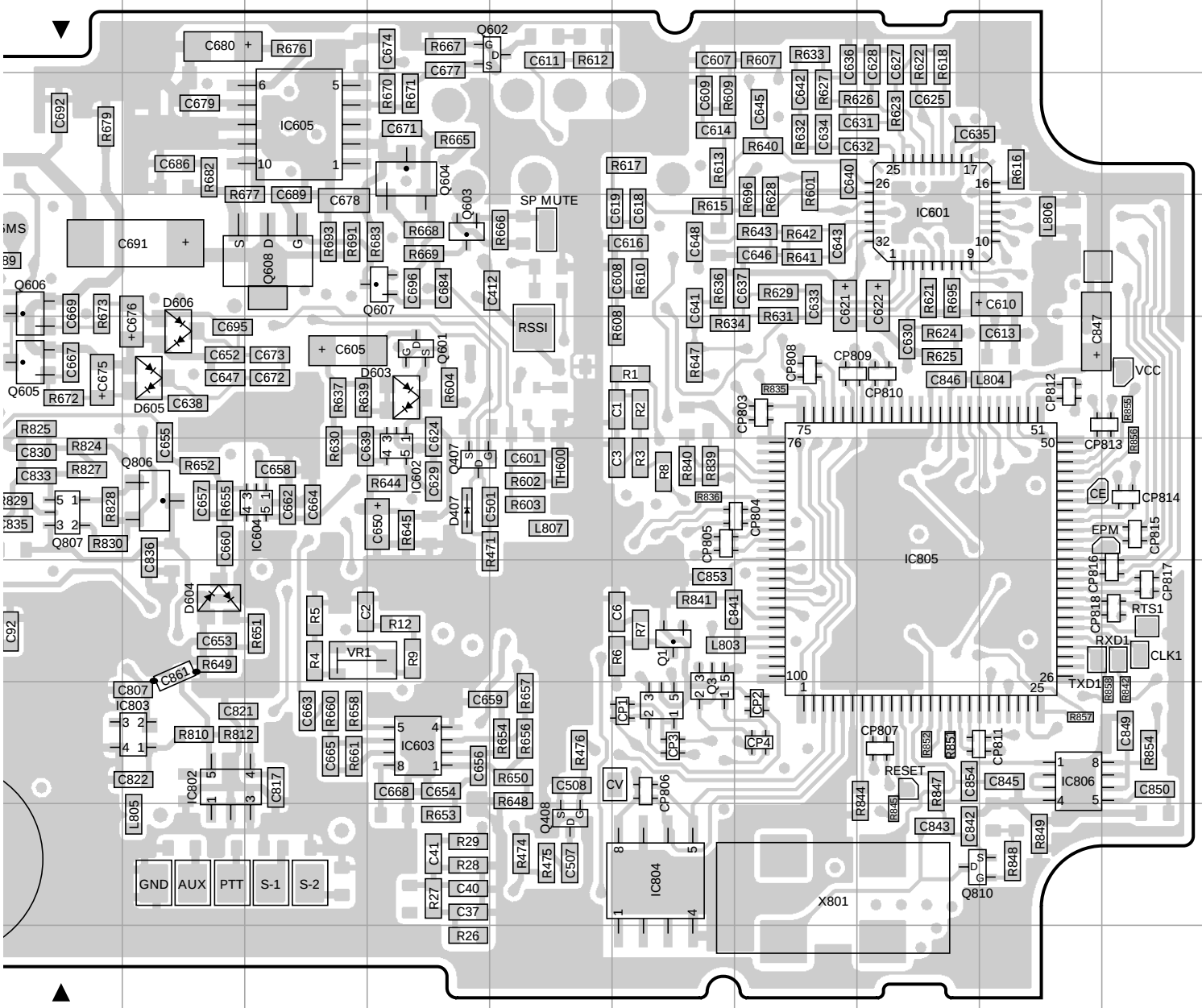
Component side

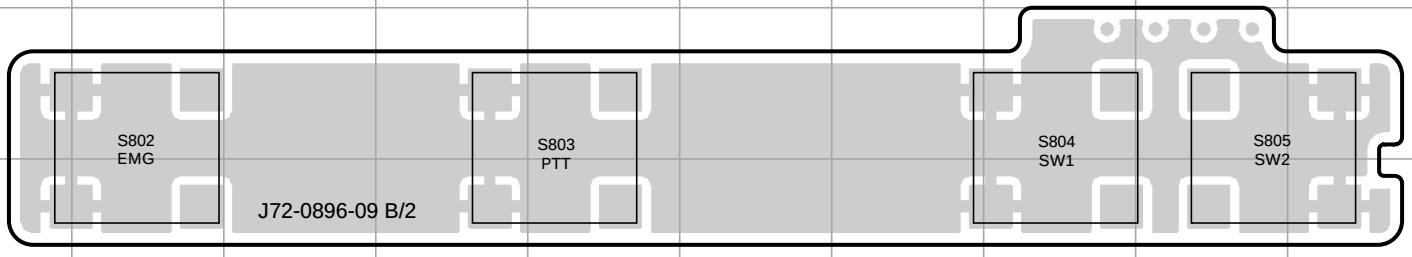
Layer 1	
Layer 2	
Layer 3	
Layer 4	
Layer 5	
Layer 6	

Foil side

PC BOARD TK-3160

TX-RX UNIT (X57-673X-XX) 0-71 : X2 2-71 : E
Component side view (J72-0896-09)

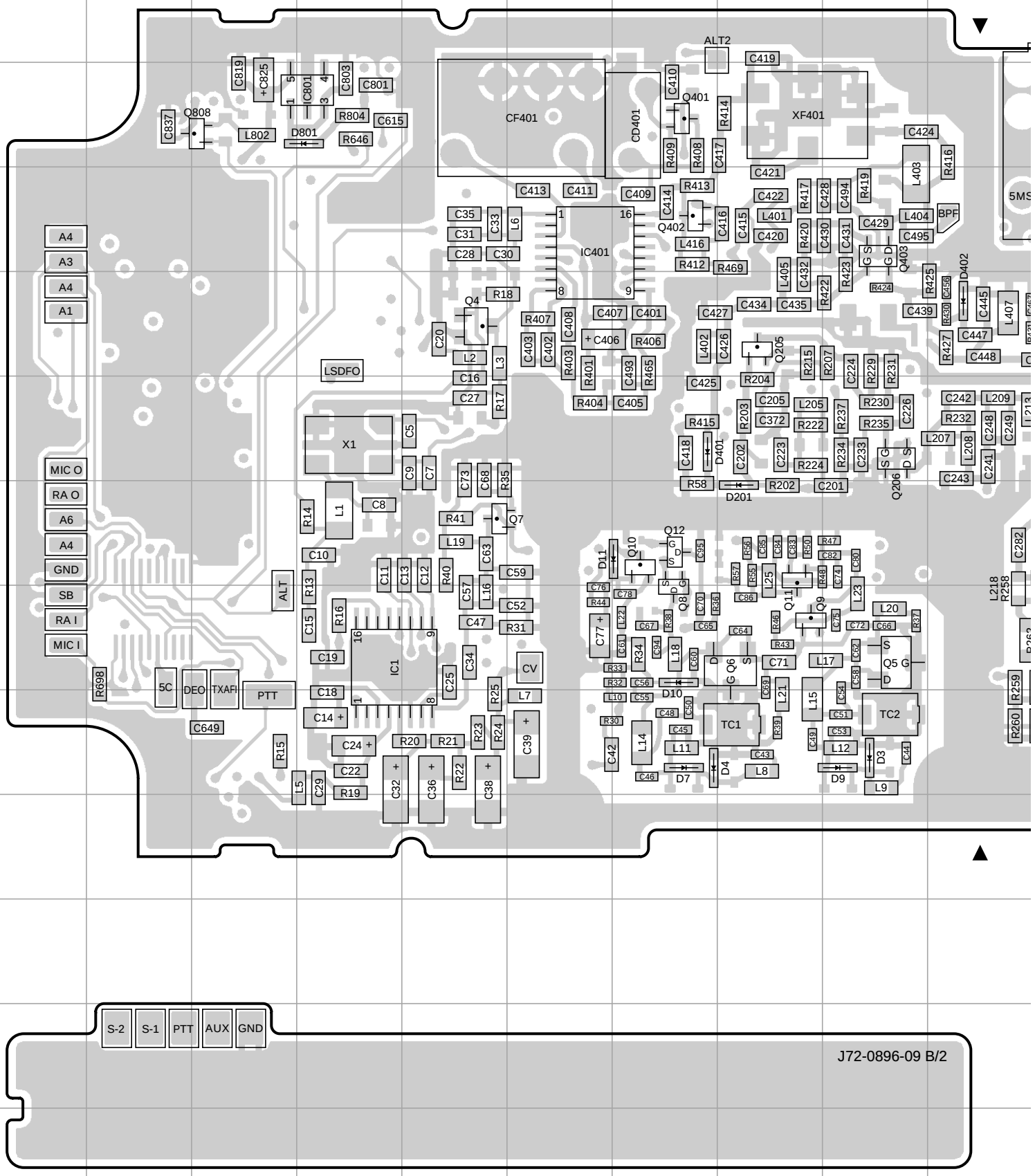




J72-0896-09 B/2

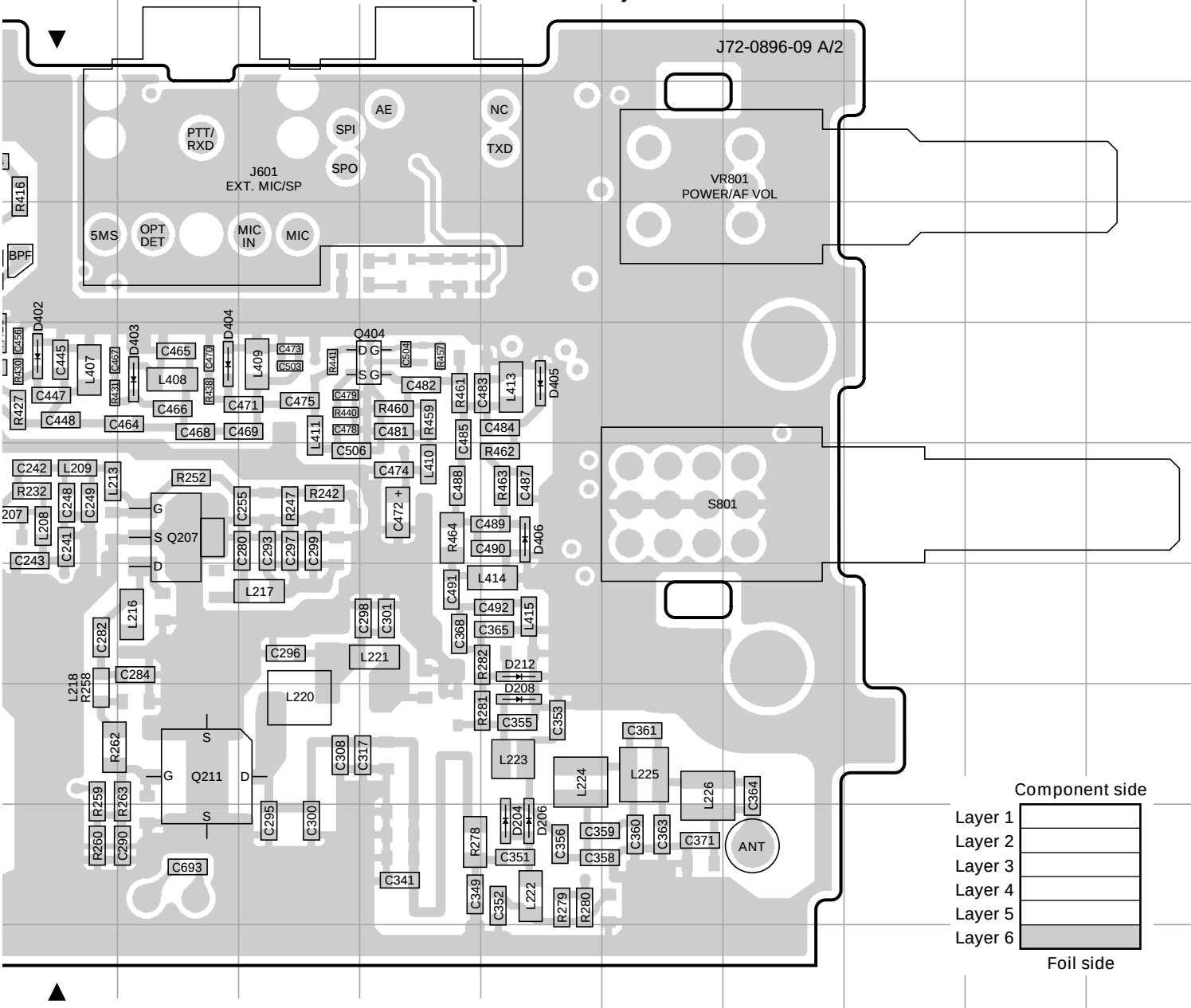
TK-3160 PC BOARD

TX-RX UNIT (X57-673X-XX) 0-71 : X2 2-71 : E
Foil side view (J72-0896-09)



PC BOARD TK-3160

TX-RX UNIT (X57-673X-XX) 0-71 : X2 2-71 : E
Foil side view (J72-0896-09)



TX-RX UNIT
(X57-673X-XX)

Ref. NO.	Address
IC1	8D
IC401	4F
IC801	3D
Q4	5E
Q5	8I
Q6	8H
Q7	7E
Q8	8G
Q9	8H
Q10	7G
Q11	7H
Q12	7G
Q205	5H
Q206	6I

Ref. NO.	Address
Q207	6K
Q211	8K
Q401	3G
Q402	4G
Q403	4I
Q404	5M
Q808	3C
D3	9I
D4	9G
D7	9G
D9	9I
D10	8G
D11	7G
D201	7H

Ref. NO.	Address
D204	9N
D206	9N
D208	8N
D212	7N
D401	6G
D402	5J
D403	5K
D404	5K
D405	5N
D406	6N
D801	3D

TK-3160 PC BOARD

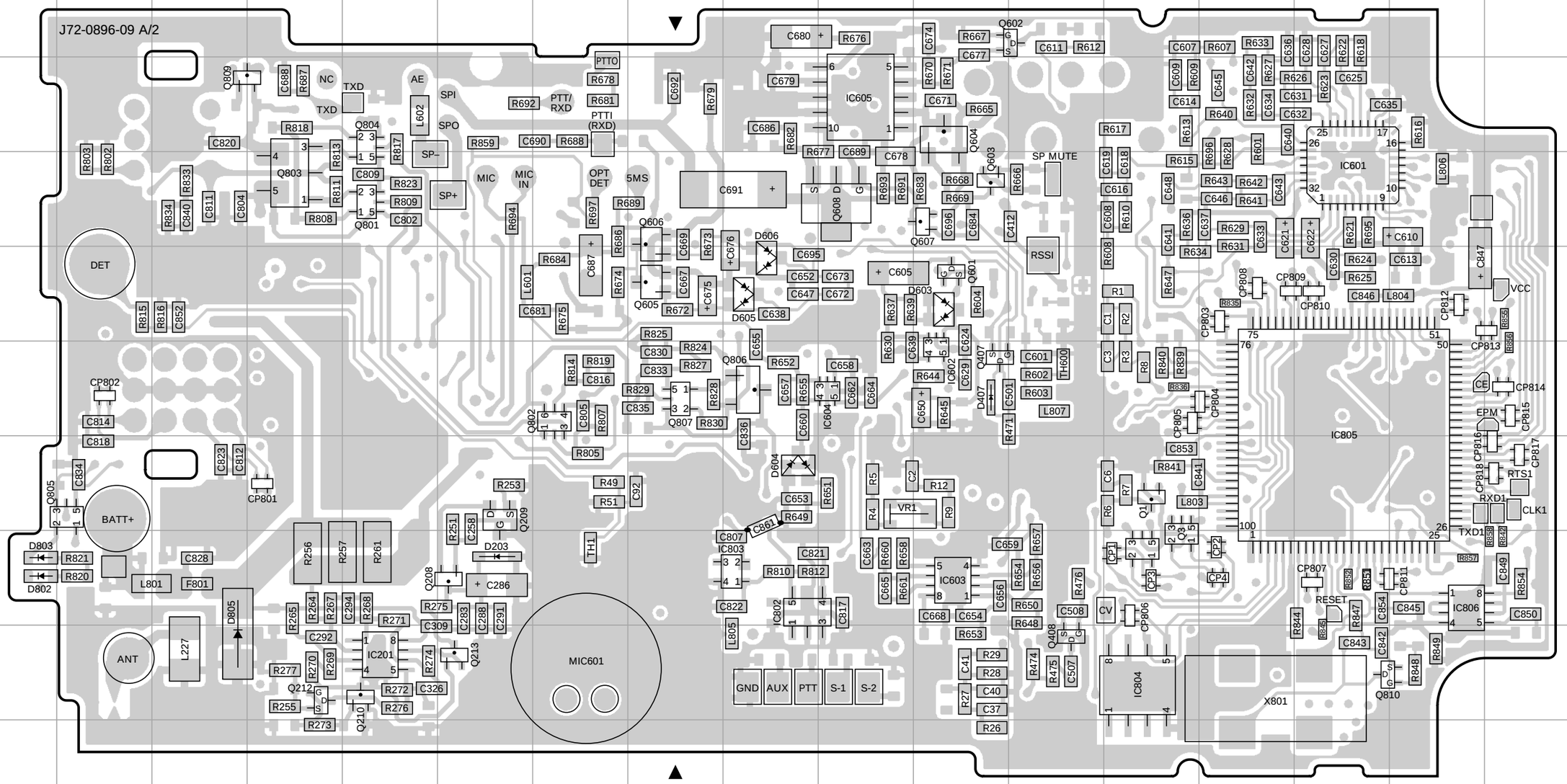
PC BOARD TK-3160

TX-RX UNIT (X57-673X-XX) 0-71 : X2 2-71 : E
Component side view (J72-0896-09)

TX-RX UNIT (X57-673X-XX) 0-71 : X2 2-71 : E
Component side view (J72-0896-09)

TX-RX UNIT
(X57-673X-XX)

Ref. NO.	Address
IC201	9G
IC601	4Q
IC602	6M
IC603	8M
IC604	6L
IC605	3L
IC802	8K
IC803	8K
IC804	9O
IC805	7Q
IC806	8R
Q1	7O
Q3	8O
Q208	8H
Q209	7H
Q210	9G
Q212	9F
Q213	9H
Q407	6M
Q408	9N
Q601	5M
Q602	2N
Q603	4M
Q604	3M
Q605	5J
Q606	4J
Q607	4M
Q608	4L
Q801	4G
Q802	6I
Q803	4F
Q804	3G
Q805	7D
Q806	6K
Q807	6J
Q809	3E
Q810	9R
D203	8H
D407	6M
D603	5M
D604	7K
D605	5K
D606	5K
D802	8C
D803	8C
D805	9E

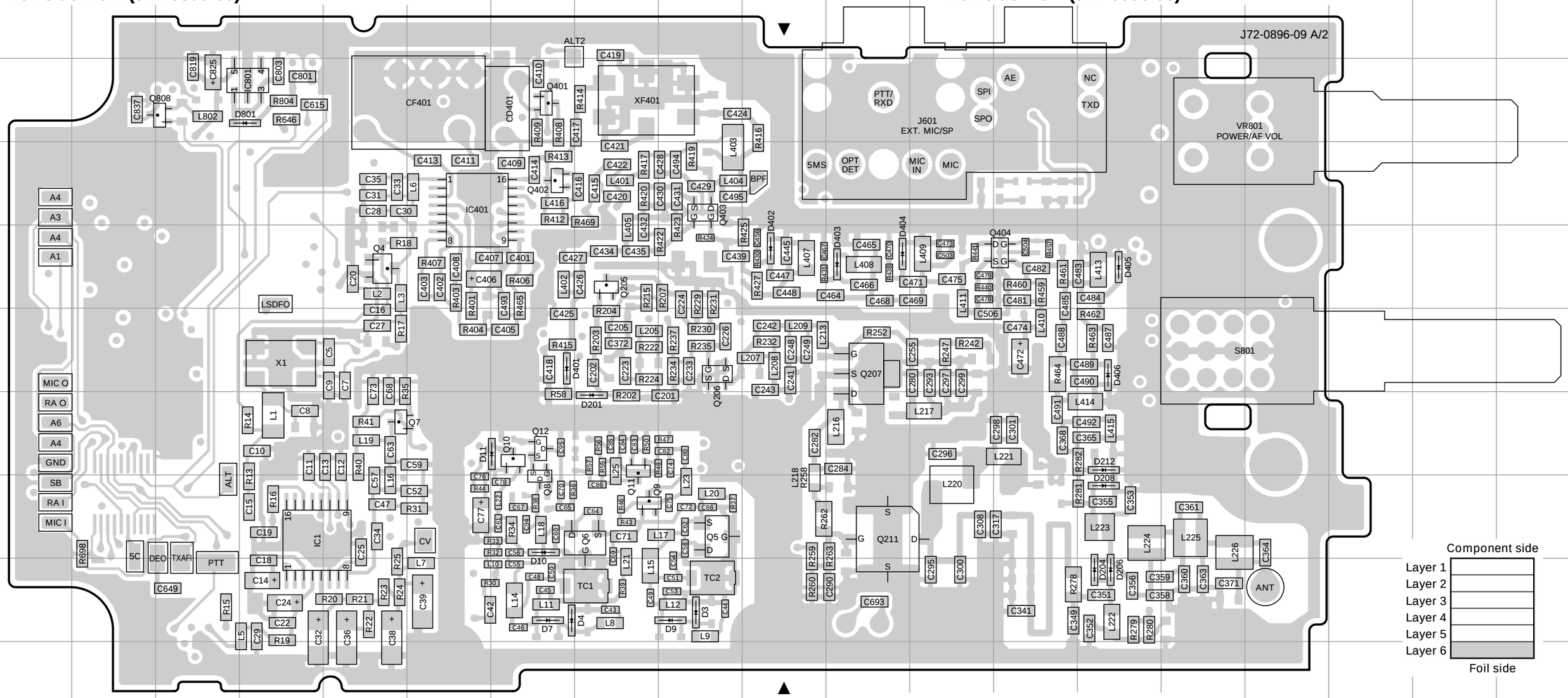


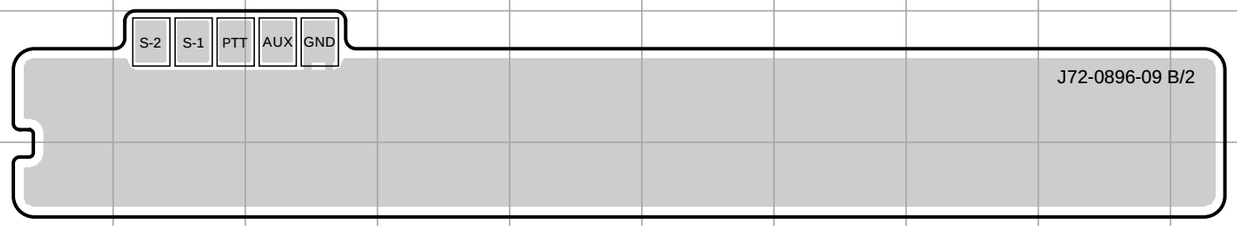
TK-3160 PC BOARD

TX-RX UNIT (X57-673X-XX) 0-71 : X2 2-71 : E
Foil side view (J72-0896-09)

PC BOARD TK-3160

TX-RX UNIT (X57-673X-XX) 0-71 : X2 2-71 : E
Foil side view (J72-0896-09)





TX-RX UNIT
(X57-673X-XX)

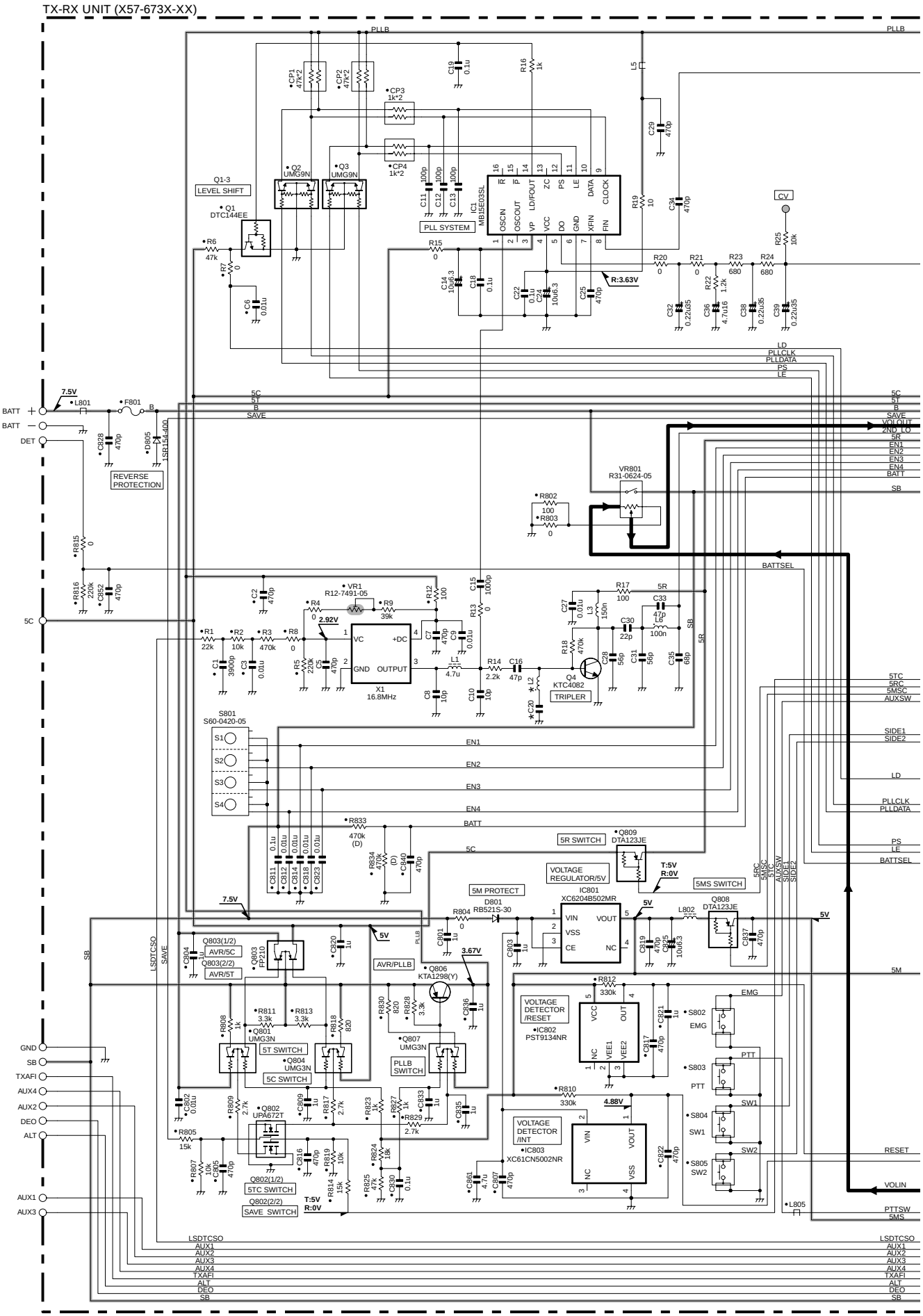
Ref. NO.	Address
IC1	8D
IC401	4F
IC801	3D
Q4	5E
Q5	8I
Q6	8H
Q7	7E
Q8	8G
Q9	8H
Q10	7G
Q11	7H
Q12	7G
Q205	5H
Q206	6I

Ref. NO.	Address
Q207	6K
Q211	8K
Q401	3G
Q402	4G
Q403	4I
Q404	5M
Q808	3C
D3	9I
D4	9G
D7	9G
D9	9I
D10	8G
D11	7G
D201	7H

Ref. NO.	Address
D204	9N
D206	9N
D208	8N
D212	7N
D401	6G
D402	5J
D403	5K
D404	5K
D405	5N
D406	6N
D801	3D

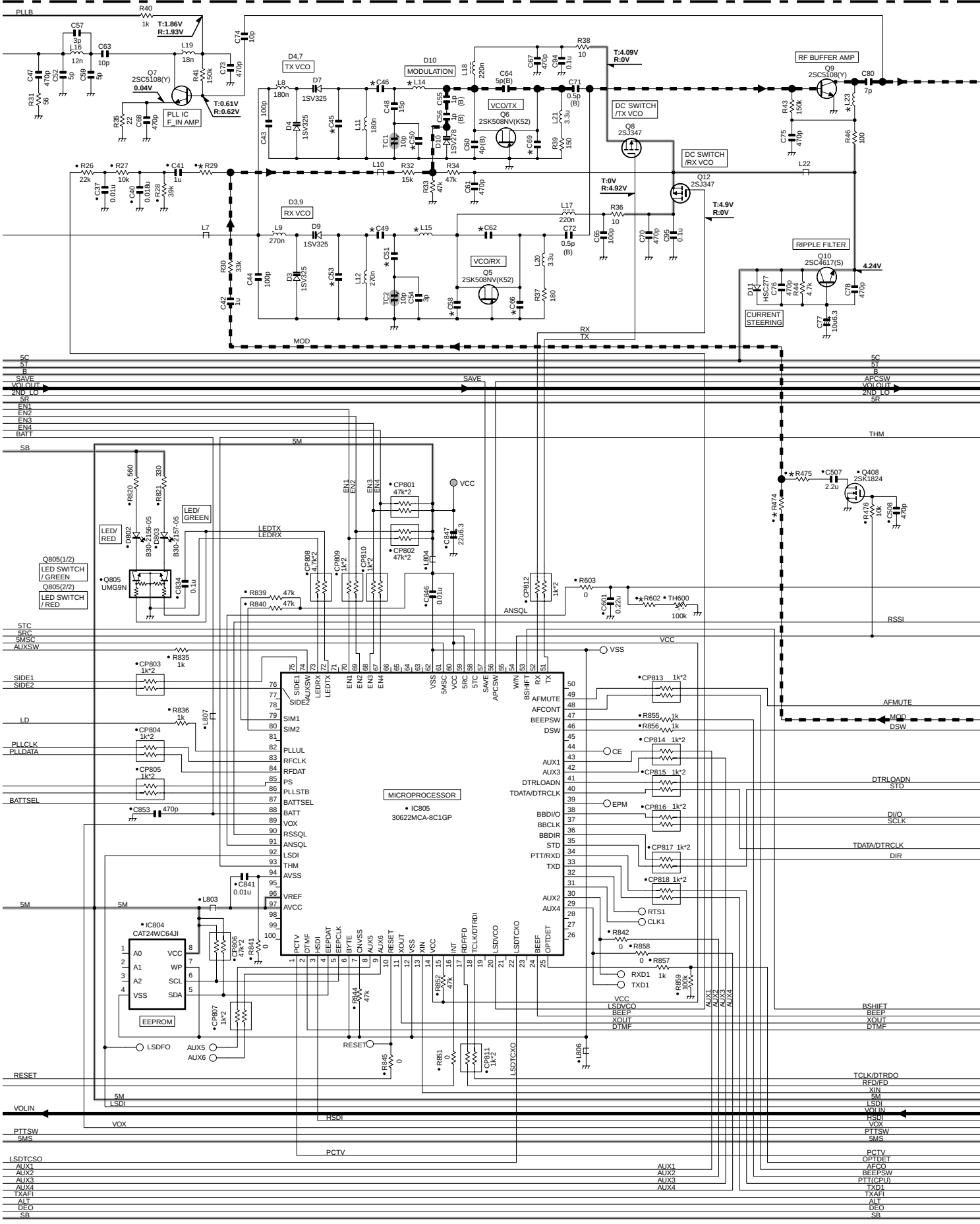
TK-3160 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-673X-XX)



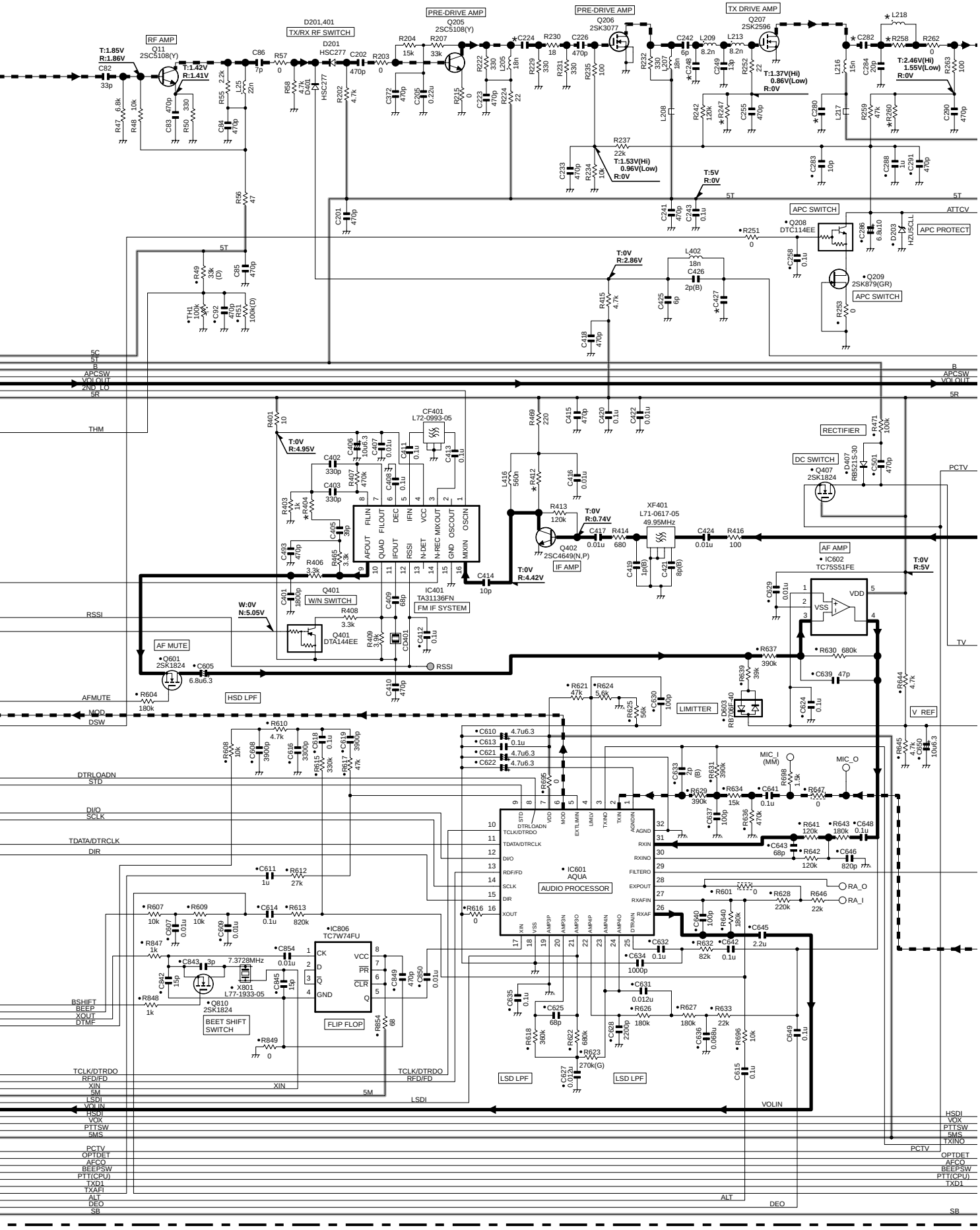
SCHEMATIC DIAGRAM TK-3160

TX-RX UNIT (X57-673X-XX)



TK-3160 SCHEMATIC DIAGRAM

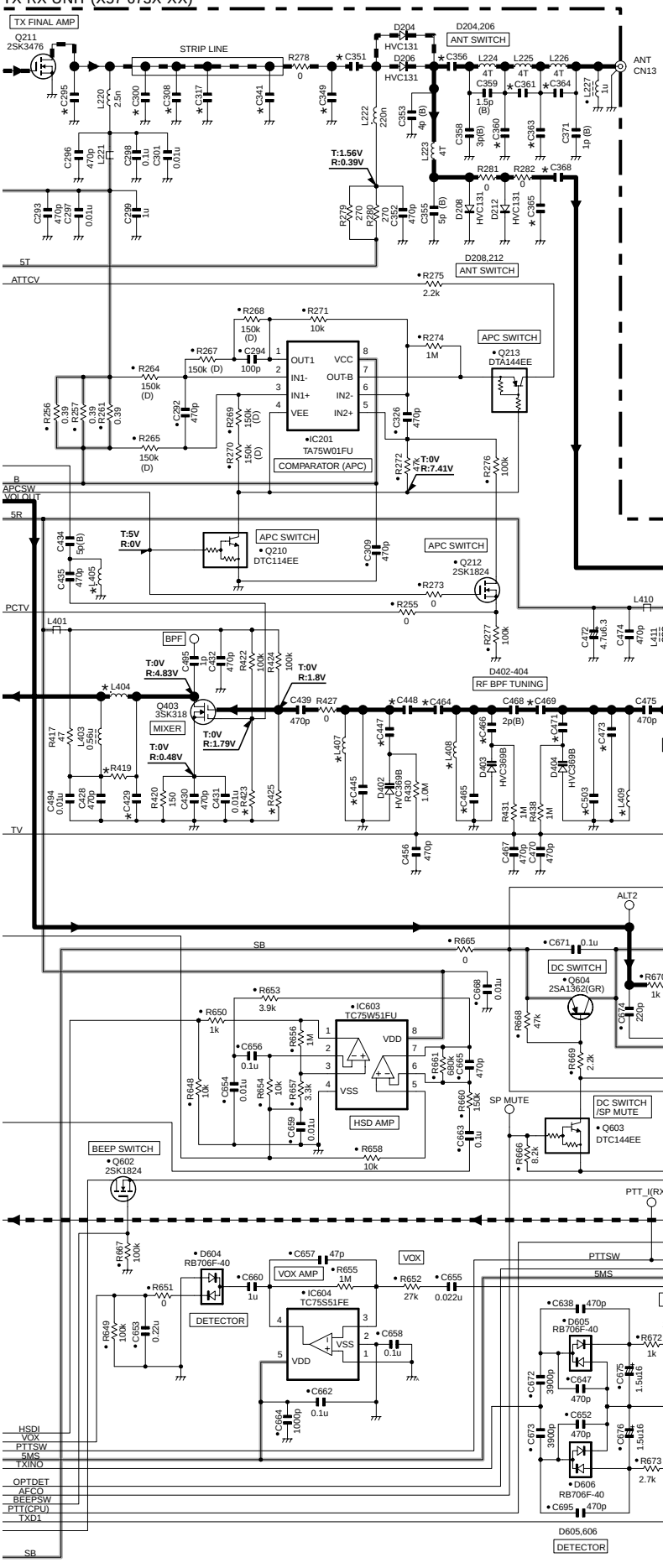
TX-RX UNIT (X57-673X-XX)



SCHEMATIC DIAGRAM TK-3160

Note : The components marked with a dot (●) are parts of layer1.

TX-RX UNIT (X57-673X-XX)



X57-673X-XX		C20	C45	C46	C49	C50	C51	C53	C58	C62	C66	C69	C224
0-71	X2	6p(B)	4p(B)	39p	47p	2p	22p	3p(B)	4p(B)	9p(B)	9p(B)	5p(B)	4p
2-71	E	NO	2p(B)	22p	33p	7p	18p	4p(B)	5p(B)	7p(B)	12p	7p(B)	7p

X57-673X-XX		C248	C280	C282	C295	C300	C308	C317	C341	C349	C351	C356
0-71	X2	NO	10p	68p	27p	18p	12p	15p	NO	6p(B)	15p	470p
2-71	E	5p	33p	22p	33p	22p	27p	NO	3.5p(B)	7p(B)	27p	100p

X57-673X-XX		C360	C361	C363	C364	C365	C368	C427	C429	C445	C447
0-71	X2	6p(B)	2p(B)	6p(B)	0.5p(B)	2p(B)	5p(B)	10p	15p	4.5p(B)	15p
2-71	E	3.5p(B)	2.5p(B)	4.5p(B)	2p(B)	NO	10p	12p	12p	4p(B)	33p

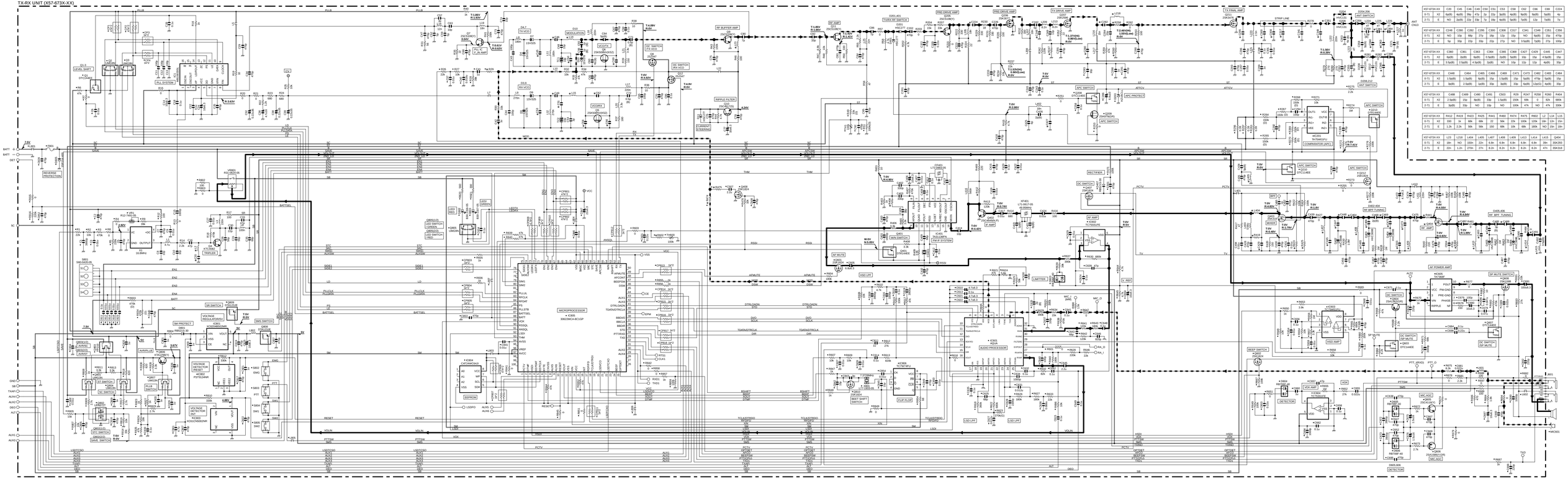
X57-673X-XX		C448	C464	C465	C466	C469	C471	C473	C482	C483	C484
0-71	X2	1.5p(B)	1.5p(B)	6p(B)	15p	1.5p(B)	15p	5p(B)	470p	5p(B)	15p
2-71	E	3p(B)	2.5p(B)	1p(B)	33p	3p(B)	33p	6p(B)	12p(G)	4p(B)	33p

X57-673X-XX		C488	C489	C490	C491	C503	R29	R247	R258	R260	R404
0-71	X2	2.5p(B)	15p	8p(B)	33p	1.5p(B)	150k	68k	0	82k	680k
2-71	E	3p(B)	33p	NO	10p	NO	100k	47k	NO	47k	330k

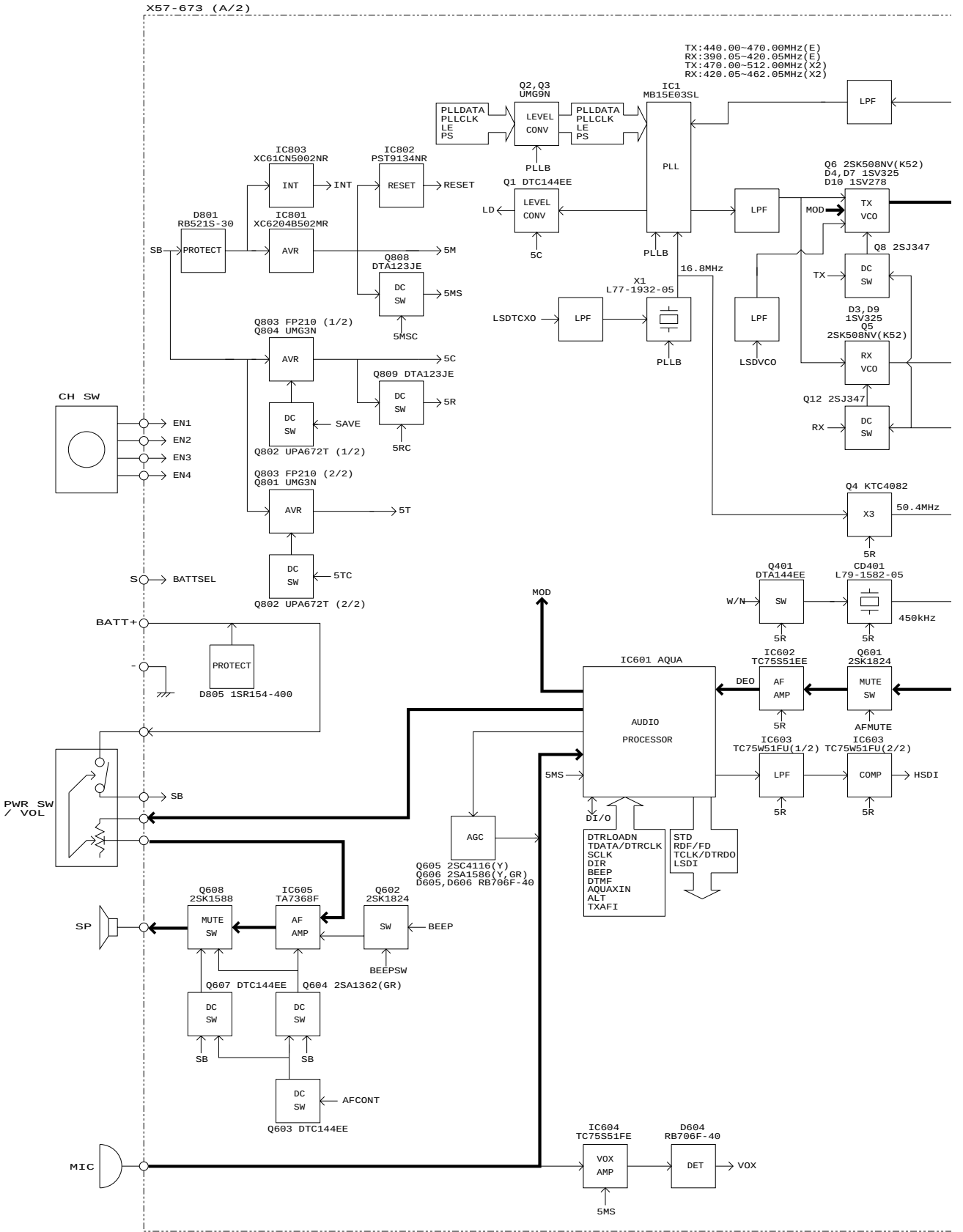
X57-673X-XX		R412	R419	R423	R425	R441	R460	R474	R475	R602	L2	L14	L15
0-71	X2	330	1k	68k	68k	22	56k	22k	100k	120k	18n	12n	15n
2-71	E	1.2k	2.2k	56k	56k	150	68k	10k	68k	180k	NO	15n	18n

X57-673X-XX		L23	L218	L404	L405	L407	L408	L409	L413	L414	L415	Q404
0-71	X2	18n	NO	150n	22n	6.8n	6.8n	6.8n	6.8n	6.8n	39n	3SK293
2-71	E	22n	1.2n	270n	27n	8.2n	8.2n	8.2n	8.2n	8.2n	47n	3SK318

TK-3160 SCHEMATIC DIAGRAM



BLOCK DIAGRAM



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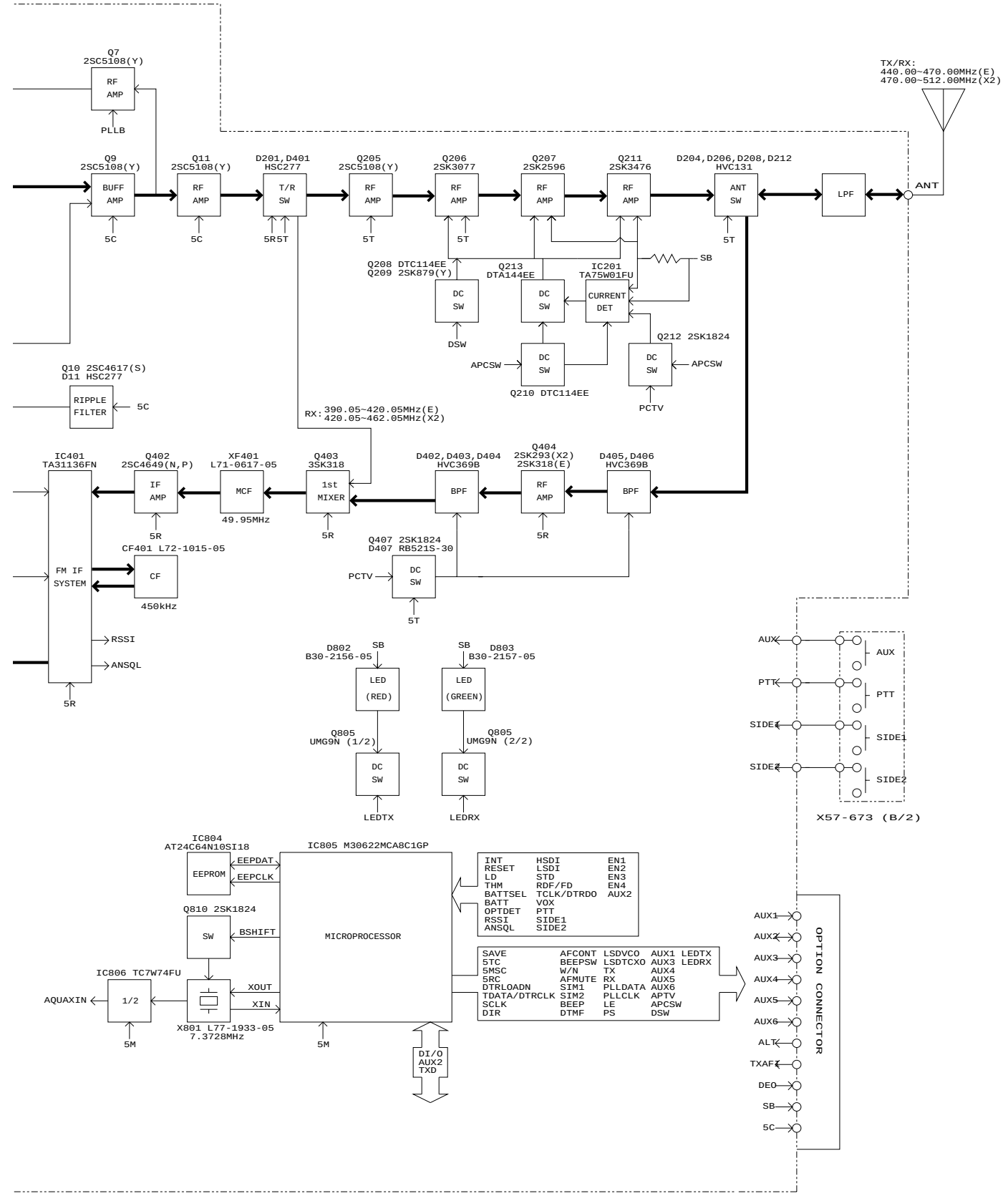
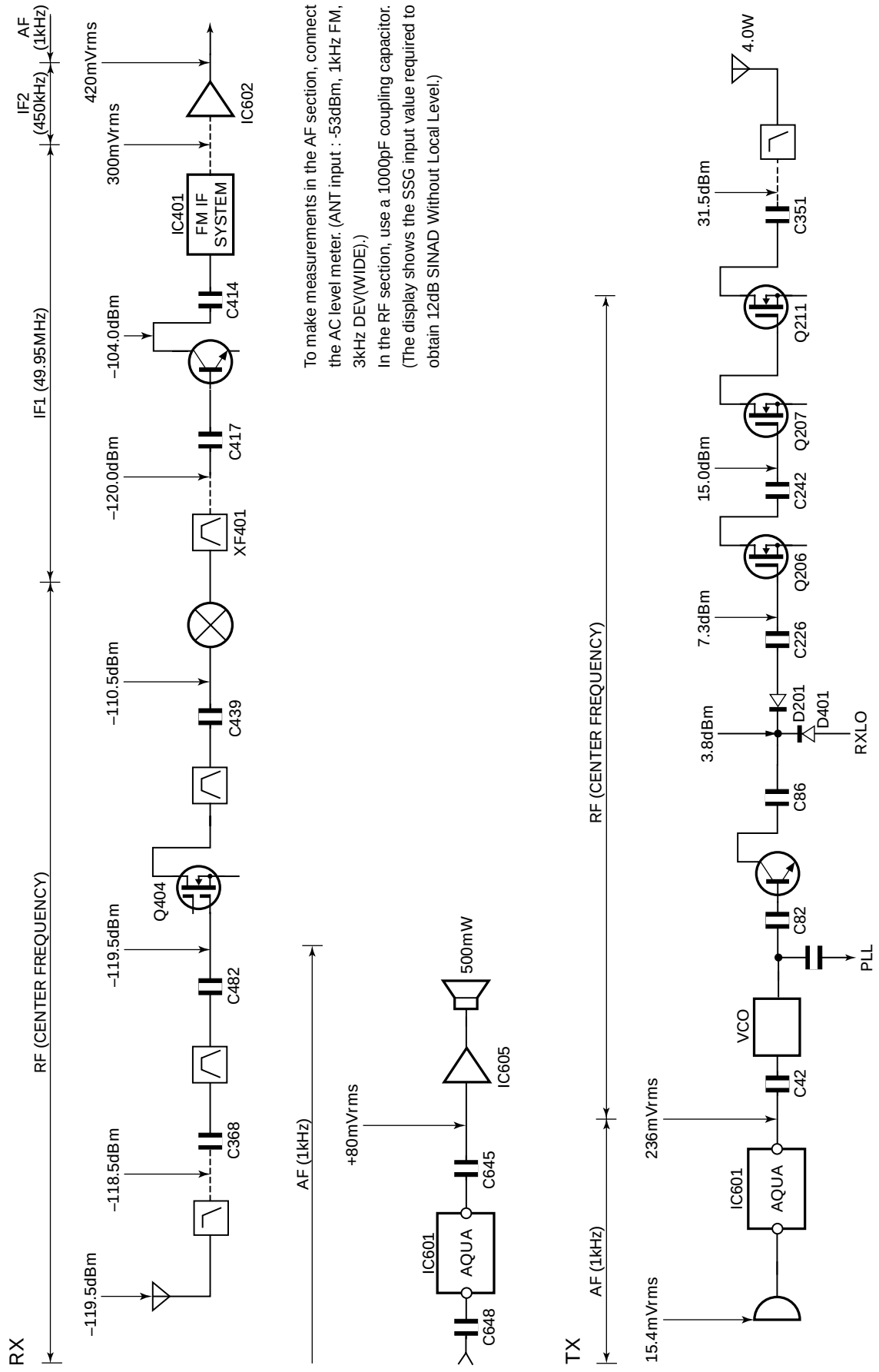
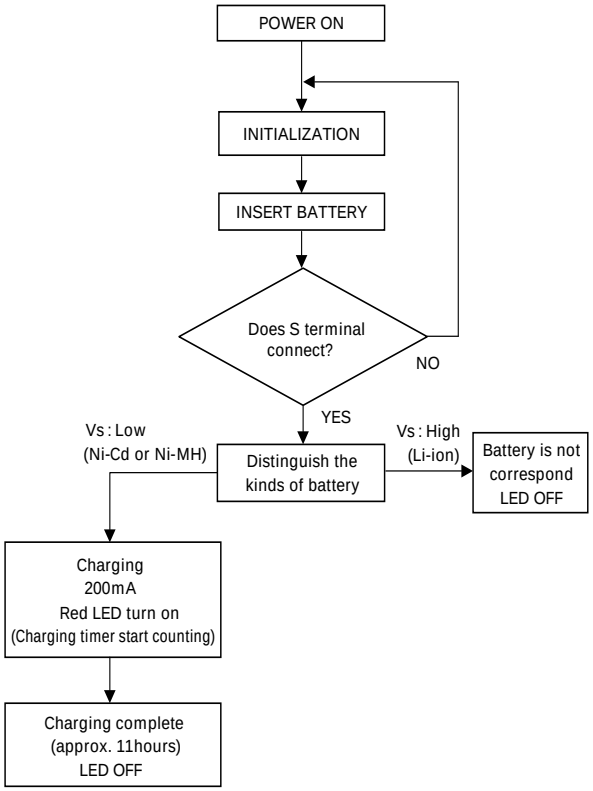


LEVEL DIAGRAM

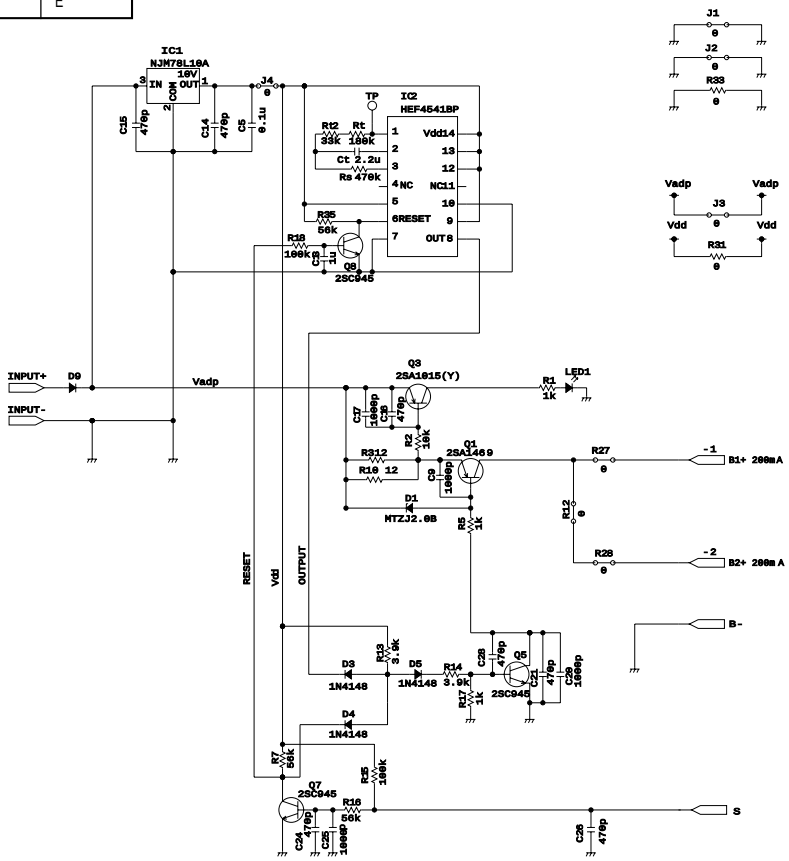


KSC-30

Operating flow chart



Ref. No.	Address	New parts	Parts No.	Description	Destination
KSC-30					
			A02-3656-08	CABINET BOTTOM	
		*	A02-3841-08	CABINET UPPER	
		*	B43-1151-08	BADGE	
		*	B62-1754-08	INSTRUCTION MANUAL	K,T
		*	B62-1755-08	INSTRUCTION MANUAL	E
		*	B72-2209-08	MODEL NAME PLATE	
		*	E03-0453-08	DC JACK	
			E23-1190-08	RELAY TERMINAL	
			G13-1547-08	CUSHION	
			N83-2610-45	PAN HEAD TAPTITE SCREW	
		*	W02-3671-08	ELECTRIC CIRCUIT MODULE	
			W08-0479-05	AC ADAPTER 120V AC 60HZ	K
			W08-0513-05	AC ADAPTER 230V AC 50HZ	T
			W08-0558-15	AC ADAPTER 230V AC 50HZ	E



TK-3160

SPECIFICATIONS

General

Frequency Range	440~470MHz (E), 470~512MHz (X2)
Number of channels	Max. 16
Number of groups	Max. 16
Channel Spacing	20kHz, 25kHz (Wide) 12.5kHz (Narrow)
PLL Channel Stepping	5kHz, 6.25kHz
Operating Voltage	7.5 VDC ±20%
Battery Life	More than 9 hours at 4 watts (5-5-90 duty cycle with KNB-24L battery)
Operating Temperature range	–30˚C to +60˚C (–22 ˚F to +140 ˚F)
Dimensions and Weight	
With KNB-24L (1400mAh battery)	56 (2-3/16) W x 109.3 (4-5/16) H x 34.5 (1-3/8) D mm (in) 290g (0.64lbs)
With KNB-25A (1200mAh battery)	56 (2-3/16) W x 109.3 (4-5/16) H x 40.7 (1-5/8) D mm (in) 355g (0.78lbs)
With KNB-26N (2000mAh battery)	56 (2-3/16) W x 109.3 (4-5/16) H x 40.7 (1-5/8) D mm (in) 400g (0.88lbs)

Receiver (Measurements made per EIA standard EIA-603, EN 300 086, EN 300 113)

Sensitivity	
EIA 12dB SINAD	0.25μV (Wide)/ 0.32μV (Narrow)
EN 20dB SINAD	–4dBμV (Wide)/ –3dBμV (Narrow)
Selectivity (Wide 5k/Wide 4k/Narrow)	70dB/70dB/62dB
Intermodulation	65dB
Spurious response	70dB
Audio Power Output	500mW/8Ω
Frequency Stability	±2.5ppm
Channel Frequency Spread	30MHz (E), 42MHz (X2)

Transmitter (Measurements made per EIA standard EIA-603, EN 300 086, EN 300 113)

RF Power output	4W/1W
Spurious and Harmonics	–36dBm 1GHz, –30dBm > 1GHz
Modulation Limiting (Wide 5k/Wide 4k/Narrow)	±5.0kHz/±4.0kHz/±2.5kHz
FM Noise (EIA) (Wide 5k/Wide 4k/Narrow)	45dB/43dB/43dB
Audio Distortion	Less than 5%
Frequency Stability	±2.5ppm
Channel Frequency Spread	30MHz (E), 42MHz (X2)

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