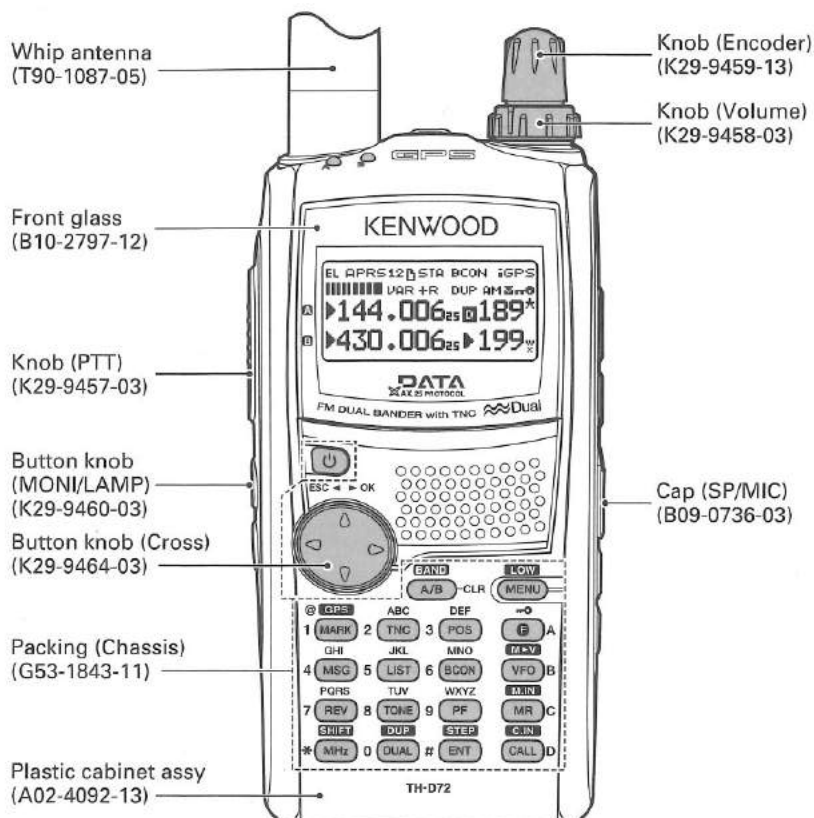


TH-D72A/D72E

SERVICE MANUAL

KENWOOD

Kenwood Corporation

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DISASSEMBLY FOR REPAIR

1. How to Remove the Case Assembly from the Chassis

1. Remove 2 screws ①.
2. Remove 2 knobs ②.
3. Remove the SP/MIC jack cover ③.
4. Remove the front panel from the chassis.

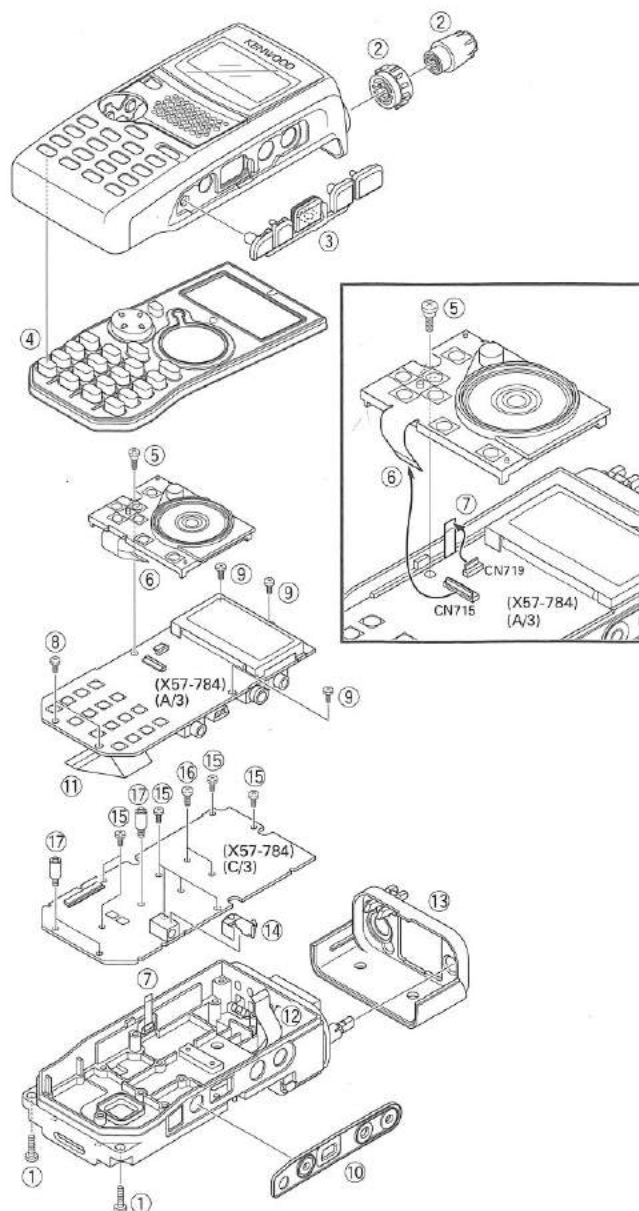
2. How to Remove the PCB

2-1. Control PCB (TX-RX A/3)

1. Remove the packing (CHASSIS) ④.
2. Remove 1 screw ⑤ then lift the SP holder and remove the FPC ⑥, ⑦.
3. Remove 5 screws ⑧, ⑨ and remove the packing (SP/MIC) ⑩.
4. Lift the control PCB and remove the FPC ⑪, ⑫ from TX-RX PCB.

2-2. RF PCB (TX-RX C/3)

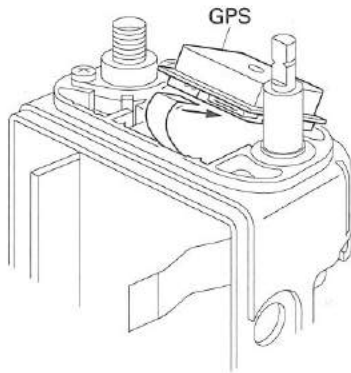
5. Remove the top panel ⑬ from the chassis.
6. Remove the solder of the earth spring ⑭ and lift.
Note: After TX-RX PCB is fixed to the chassis with the screws, the earth spring is installed.
7. Remove 10 screws ⑮, ⑯, and 3 round screw ⑰.
8. Lift the TX-RX PCB.



DISASSEMBLY FOR REPAIR

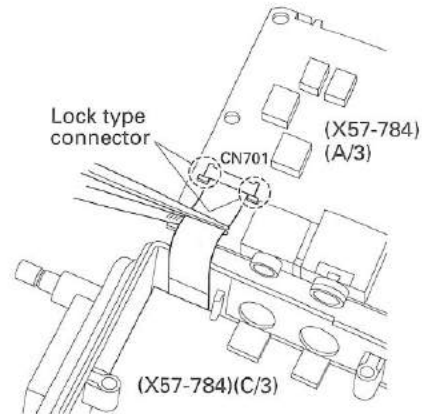
3. How to Remove the GPS Module

1. The GPS module is connected with FPC and fixed to the chassis with the double-faced tape. Then lift and pull out the GPS module with the small screwdriver.

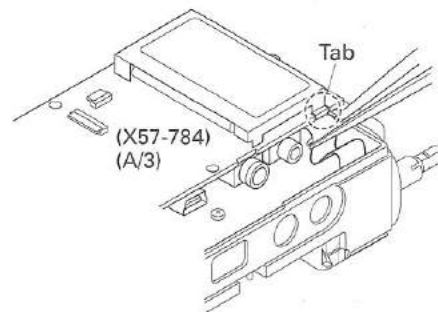


4. Precautions for Reassembly

1. Push the FPC shown in figure when assemble PCB and the chassis.



2. Do not touch tab of LCD holder FPC. FPC is damaged. Please assemble FPC after it as shown in figure.



CIRCUIT DESCRIPTION

1. Outline

The TH-D72A/D72E is an FM Dual Band (A: 144/440MHz/ E: 144/430MHz) handheld transceiver designed to be used as an Amateur Radio.

2. Frequency Configuration

This equipment has an individual VCO/PLL and IF circuit for both Band A and B. Using these circuits, it can receive 2 separate bands and can transmit and receive at the same time.

The VCO of Band A is used for the first-local oscillator for VHF/UHF reception of Band A. The VCO of Band B is used for VHF/UHF transmission with modulator by 2-VCOs and for the first-local oscillator for VHF/UHF reception of Band B.

The reference oscillator of 16.8MHz connected with each PLL IC for Band A and B are used as the comparison frequency at each PLL IC. The reference oscillator of Band A is generated three times to 50.400MHz and is used for the second-local oscillator for the reception of Band A. The second-local oscillator for the reception of Band B uses the crystal oscillator of 45.505MHz.

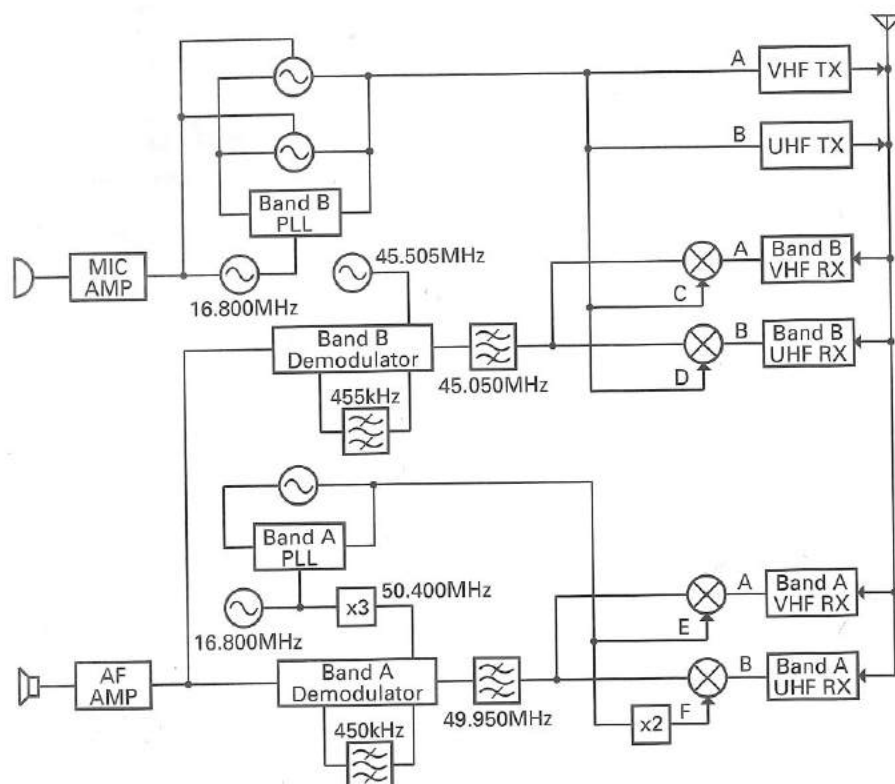


Figure 1 Frequency configuration

	TH-D72A (K-type)	TH-D72E (E-type)
A	144.000 ~ 147.995MHz	144.000 ~ 145.995MHz
B	438.000 ~ 449.995MHz	430.000 ~ 439.995MHz
C	189.050 ~ 193.045MHz	189.050 ~ 191.045MHz
D	392.950 ~ 404.945MHz	384.950 ~ 394.945MHz
E	193.950 ~ 197.945MHz	193.950 ~ 195.945MHz
F	388.050 ~ 400.045MHz	380.050 ~ 390.045MHz

Table 1 Frequency configuration

CIRCUIT DESCRIPTION

3. Receiver System

3-1. VHF receiver circuit

■ A band VHF receiver circuit

The reception signal from the antenna passes through a filter circuit and goes to the RF amplifier (Q11). The amplified signal then enters the band-pass filter. After the signal passes through the band-pass filter, it is amplified by a second RF amplifier (Q8) and passed through the band-pass filter before entering the mixer (Q2). The signal converted by the first-local oscillator (Upper heterodyne) to generate the first IF signal (49.950MHz) passes through the MCF (XF351), is amplified by the IF amplifier (Q358) and then enters the FM IC (IC353). The signal is converted to the second IF signal (455kHz) by the second-local oscillator (Upper heterodyne) which generated three times to 50.400MHz and is detected to generate an audio signal.

■ B band VHF receiver circuit

The reception signal from the antenna passes through a filter circuit and goes to the RF amplifier (Q13). The amplified signal then enters the band-pass filter. After the signal passes through the band-pass filter, it is amplified by a second RF amplifier (Q8) and passed through the band-pass filter before entering the mixer (Q4). The signal converted by the first-local oscillator (Upper heterodyne) to generate the first IF signal (45.050MHz) passes through the MCF (XF352), is amplified by the IF amplifier (Q359) and then enters the FM IC (IC354). The signal is converted to the second IF signal (455kHz) by the second-local oscillator (Upper heterodyne) and is detected to generate an audio signal.

■ VHF accompanying circuit

Each band-pass filter is tuned to a target frequency through the variable-capacitance Diode by the tuning voltage output from E-Volume (IC721) controlled with the Main MCU (IC737).

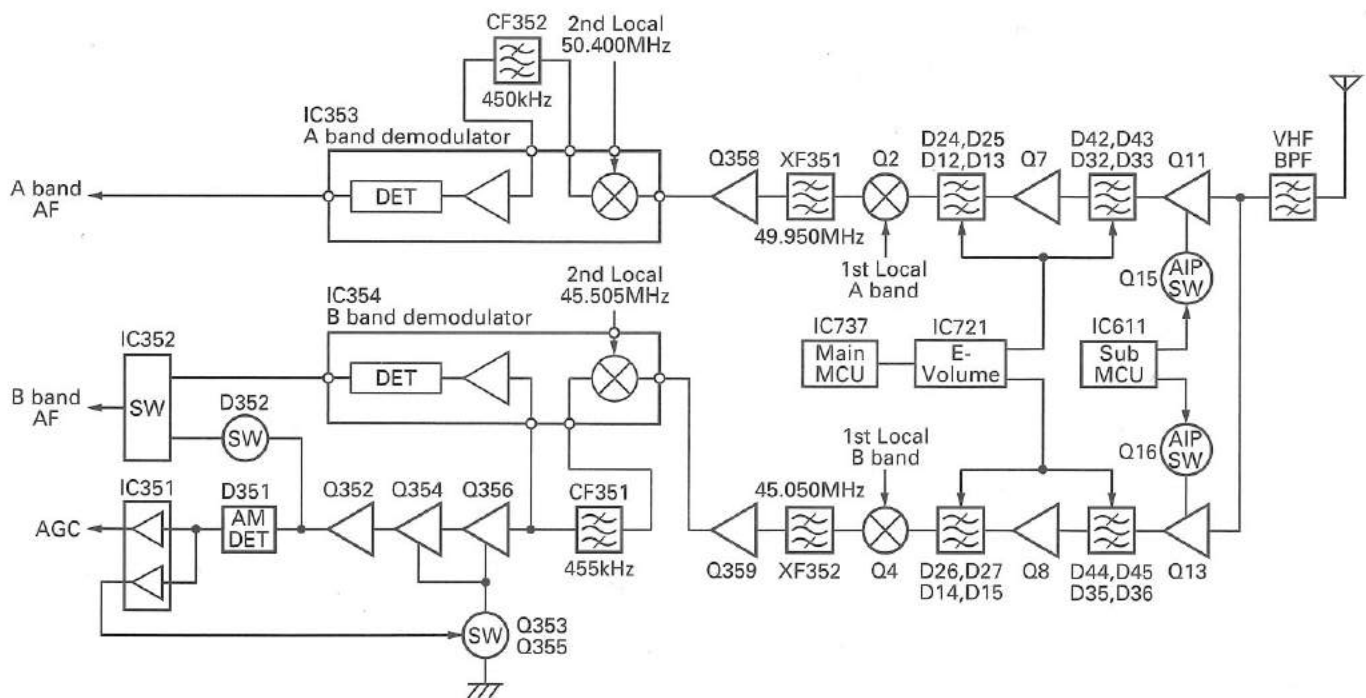


Figure 2-1 VHF receiver circuit

CIRCUIT DESCRIPTION

3-2. UHF receiver circuit

■ A band UHF receiver circuit

The reception signal from the antenna passes through a filter circuit and goes to the RF amplifier (Q10). The amplified signal then enters the band-pass filter. After the signal passes through the band-pass filter, it is amplified by a second RF amplifier (Q6) and passed through the band-pass filter before entering the mixer (Q3). The signal converted by the first-local oscillator (Lower heterodyne) to generate the first IF signal (49.950MHz) passes through the MCF (XF351), is amplified by the IF amplifier (Q358) and then enters the FM IC (IC353). The signal is converted to the second IF signal (455kHz) by the second-local oscillator (Upper heterodyne) which generated three times to 50.400MHz and is detected to generate an audio signal.

■ B band UHF receiver circuit

The reception signal from the antenna passes through a filter circuit and goes to the RF amplifier (Q9). The amplified signal then enters the band-pass filter. After the signal passes through the band-pass filter, it is amplified by a second RF amplifier (Q5) and passed through the band-pass filter before entering the mixer (Q1). The signal converted by the first-local oscillator (Lower heterodyne) to generate the first IF signal (45.050MHz) passes through the MCF (XF352), is amplified by the IF amplifier (Q359) and then enters the FM IC (IC354). The signal is converted to the second IF signal (455kHz) by the second-local oscillator (Upper heterodyne) and is detected to generate an audio signal.

■ UHF accompanying circuit

Each band-pass filter is tuned to a target frequency through the variable-capacitance Diode by the tuning voltage output from E-Volume (IC721) controlled with the Main MCU (IC737).

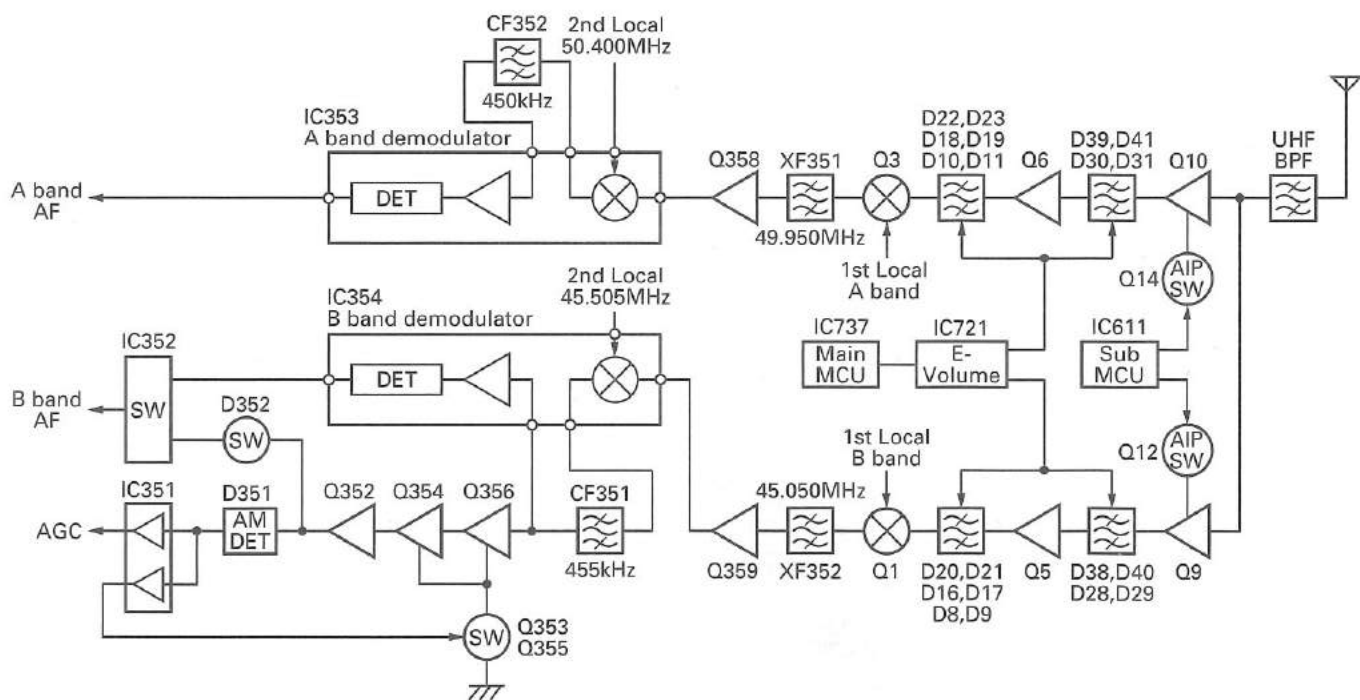


Figure 2-2 UHF receiver circuit

CIRCUIT DESCRIPTION

4. Transmitter System

4-1. Transmitter circuit

The VHF TX signal of the VCO B output through the RF amplifier (Q201) passes through the band switches (D202, D205), is amplified with the Pre-drive amplifier (IC202) and Drive amplifier (Q214), passes through the band switch (D211) and is amplified to the final output level with the Final amplifier (Q215). The signal then passes through the antenna switch (D215, D216), Duplexer and LPF, and is fed to the antenna.

The UHF TX signal of the VCO B output through the RF amplifier (Q201) passes through the band switches (D201, D204), is amplified with the Pre-drive amplifier (IC202) and Drive amplifier (Q214), passes through the band switch (D212) and is amplified to the final output level with the Final amplifier (Q215). The signal then passes through the antenna switch (D217, D222), Duplexer and LPF, and is fed to the antenna.

4-2. APC circuit

The Automatic transmission Power Control (APC) is a circuit to obtain a steady TX Power, and controls the TX Power detecting the drain current of the Drive amplifier (Q214) and Final amplifier (Q215). The voltage difference generated by the drain current in the resistors (R216, R217) is amplified with the OP-Amplifier (IC201) and DC Amplifier (Q207), and the detecting voltage is obtained. The control voltage output from E-volume (IC721) controlled with the Main MCU (IC737) according to each band and TX Power is prepared. These two obtained voltages are compared with the OP-Amplifier (IC203) and obtains the APC voltage. The Gate voltage of the Drive amplifier (Q214) and Final amplifier (Q215) is changed depending on this APC voltage and the TX Power is controlled.

4-3. Thermal protection circuit

The Sub MCU (IC611) observes the detecting voltage by the Thermistor (TH201) arranged to prevent the thermal fracture of the Final amplifier (Q215). The APC voltage is changed when the preset temperature is exceeded, and excessive generation of heat is prevented by controlling the TX Power.

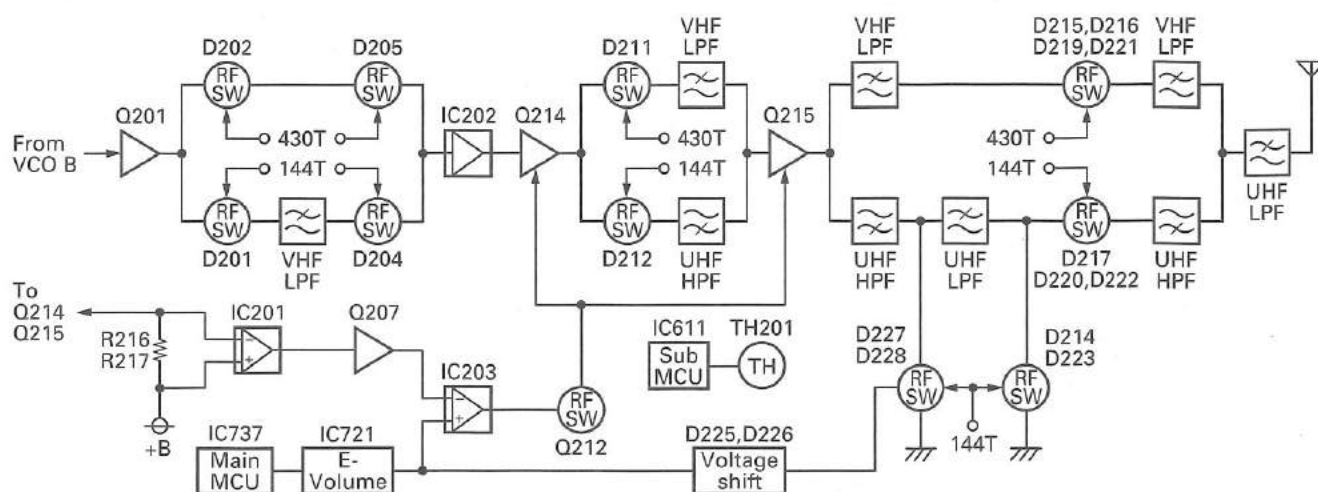


Figure 3 Transmitter circuit

5. VCO-PLL Circuit

5-1. Oscillator circuit

The reference frequency (16.800MHz) generated with the TCXO (X431) of the Band A oscillation circuit is divided frequency in the PLL IC (IC431) and obtains the comparison frequencies of 5kHz or 6.25kHz. Similarly, the reference frequency (16.800MHz) generated with the TCXO (X511) of the Band B oscillation circuit is divided frequency in the PLL IC (IC513) and obtains the comparison frequencies of 5kHz or 6.25kHz. The reference oscillator of Band A generated to three times with the RF amplifier (Q357) is used also for the second-local oscillator for the reception of Band A.

The Band A VCO oscillates and is amplified with oscillation amplifier (Q435), and output to the F-in amplifier (Q434)

and F-out amplifier (Q437) through the Buffer amplifier (Q436). The Band B VCO oscillates and is amplified with two oscillation amplifiers (Q522, Q523), and output to the F-in amplifier (Q521) and F-out amplifier (Q201) through the Buffer amplifier (Q524). To improve the modulation characteristics of the DCS and 9600bps packet signal, the modulation is put on the TCXO (X431) of Band B.

5-2. Phase comparator

The PLL ICs (IC431, IC513) of the pulse-swallow method divides the input oscillator frequency and reference frequency according to the PLL Data from the Sub MCU (IC611), and achieves the PLL synthesizer corresponding to the step frequency by comparing phases.

CIRCUIT DESCRIPTION

5-3. Lock voltage

The pulse signal obtained by the phase comparison in each PLL IC (IC431, IC513) is sweep-output with the built-in charge-pump. After removing the ripple with the loop-filter, it controls the oscillator frequency as a control voltage of each VCO.

5-4. Unlock detection circuit

The terminal LD (pin 14) of each PLL IC (IC431, IC513) outputs the "L" level at the Unlock statement. The main MCU (IC737) observes this, and controls the change timing of transmission, reception, etc.

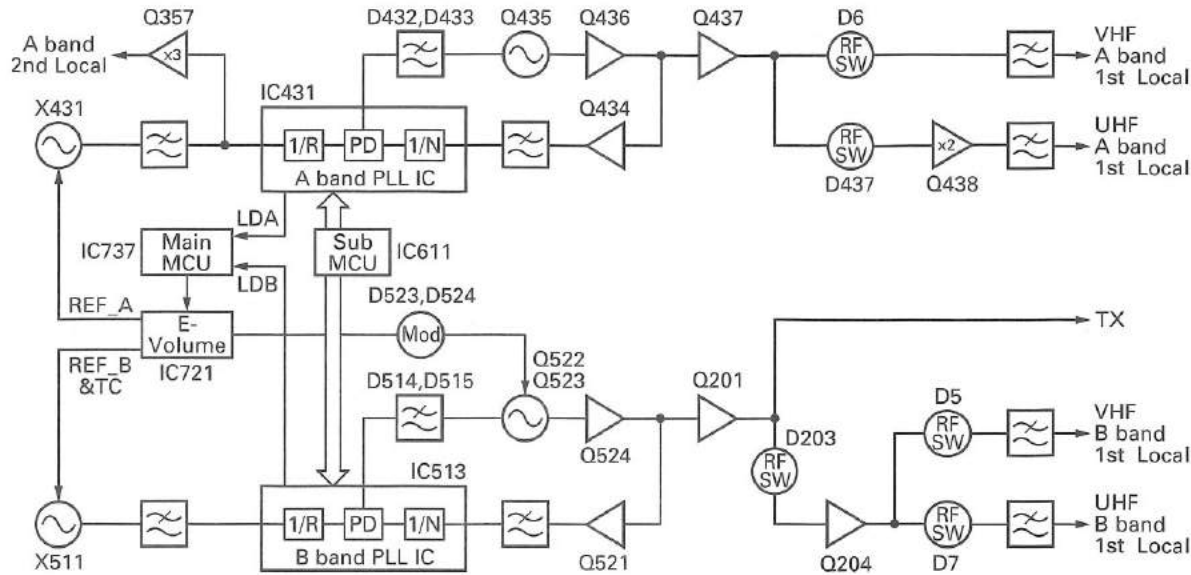


Figure 4 VCO-PLL circuit

6. Power Supply Circuit

6-1. DC-IN circuit

The DC-DC IC (IC644) operates according to the control signal from the Reset IC (IC639) when the power supply is supplied to the DC-IN JACK, and +B voltage is obtained. +B voltage changes with the DC switch (Q663) controlled with the Sub MCU (IC611), and obtains 10.8V (reception) and 8.0V (transmission).

6-2. Lithium-ion battery charging control circuit

When the power supply is supplied to the DC-IN JACK with the Lithium-ion battery installed, the charge processing is done to the Lithium-ion battery.

The main MCU (IC737) recognizes that the DC switch (Q642) becomes "L" level when the power supply is supplied to the DC-IN JACK, and assumes the gate of the DC switch (Q648) to be "H" level, and it is turned on. If the comparator IC (IC641) is "L" level (approximately 8.4V or less) at this time, the DC switch (Q646) is turned on. As a result, a constant voltage of about 1.5V is impressed from the regulator IC (IC643) to the base of the DC switch (Q643), the current between the collector-emitter becomes constant, and the current that flows to the Lithium-ion battery is constantly controlled.

Moreover, the current is switched by turning the DC switch (Q653) on and off according to the voltage of the Lithium-ion battery, and the charge is switched preliminary

and usually charge (preliminary charged in 6V or less). The voltage detection of the Lithium-ion battery has gone by the differential amplification by OP-Amplifier (IC642). The sub MCU (IC611) is protected from the detecting voltage at Power-off with the DC switch (Q662).

Normally, when pin 5 of the comparator IC (IC641) becomes "H" level (approximately 8.4V or more), the DC switch (Q646) is turned off, and it changes into the charging status in the constant voltage because the base voltage of the DC switch (Q643) is not stable. The emitter voltage of the DC switch (Q643) is observed by the sub MCU (IC611) so that the current may decrease gradually in the constant voltage charge. When the threshold is exceeded, the DC switch (Q648) is turned off and the charge is stopped.

6-3. Protection circuit

The environmental temperature detected with the Thermistor (TH703) is observed with the Main MCU (IC737), and the DC switch (Q648) is assumed turned off, and the charge is stopped when it is out of the temperature range ($0^{\circ}\text{C} \leq \text{Temp} \leq 45^{\circ}\text{C}$).

When the excess voltage is impressed from the DC-IN JACK, the circuit is protected by intercepting the power supply with the DC switches (Q649, Q645).

Moreover, power consumption is reduced by intercepting the DC switches (Q651, Q652) according to the SAVE1 signal from the Sub MCU (IC611) while in save mode.

CIRCUIT DESCRIPTION

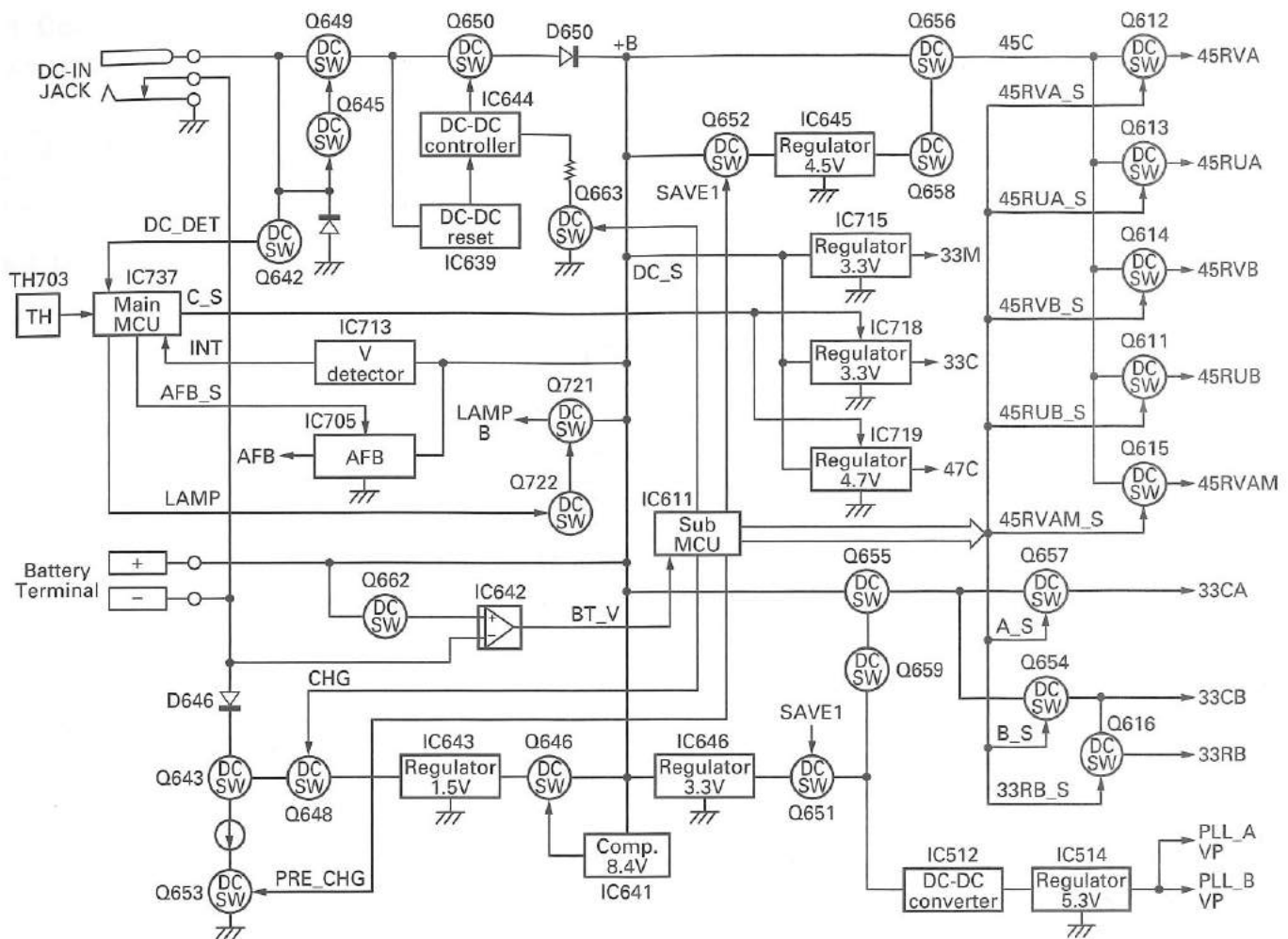


Figure 5 Power supply circuit

7. AF Signal System

7-1. Reception AF circuit

■ Demodulation signal circuit

The reception AF signal demodulated by each IF IC (IC353, IC354) for Band A/B is independently input to E-volume (IC721). The volume balance in each Band is pre-set. To assume the AF level from the SP to be about the same in each mode of Wide/Narrow, the output level of E-volume is adjusted to half at the Wide mode in Narrow mode.

The reception AF signal passes the de-emphasis circuit (Q718, Q717, Q715) and AF MUTE switch (Q711), and enters the AF VOL for the loudness control. In addition, it is amplified by the Final AF Amplifier (IC734), and SP is driven through the SP MUTE switch (Q703).

Moreover, power consumption is reduced by intercepting the DC switch (Q709) according to the SAVE2 signal from the Main MCU (IC703) in save mode.

■ Tone decode circuit

The reception AF signal when the CTCSS, DCS and Weather-alert-function (K-type only) are used, amplifies the selected signal to the necessary level with the active filter amplifier (IC722) individually prepared for Band A/B, and processes the decode with the Main MCU (IC737).

■ BEEP, DTMF circuit

The BEEP and DTMF signals generated from the Main MCU (IC737) are input to the Final AF Amplifier (IC734), and drive the SP through the SP MUTE switches (Q702, Q703).

When the BEEP and DTMF signals are output, it is assumed that MUTE-ON by the AF MUTE switch (Q711) controlled with the Main MCU (IC737), and it is separated and output with the reception AF signal.

■ Squelch circuit

The Main MCU (IC737) takes the noise element (SQA, SQB) and signal strength (SMA, SMB) obtained from each IF IC (IC353, IC354), and controls the AF MUTE switch (Q703).

CIRCUIT DESCRIPTION

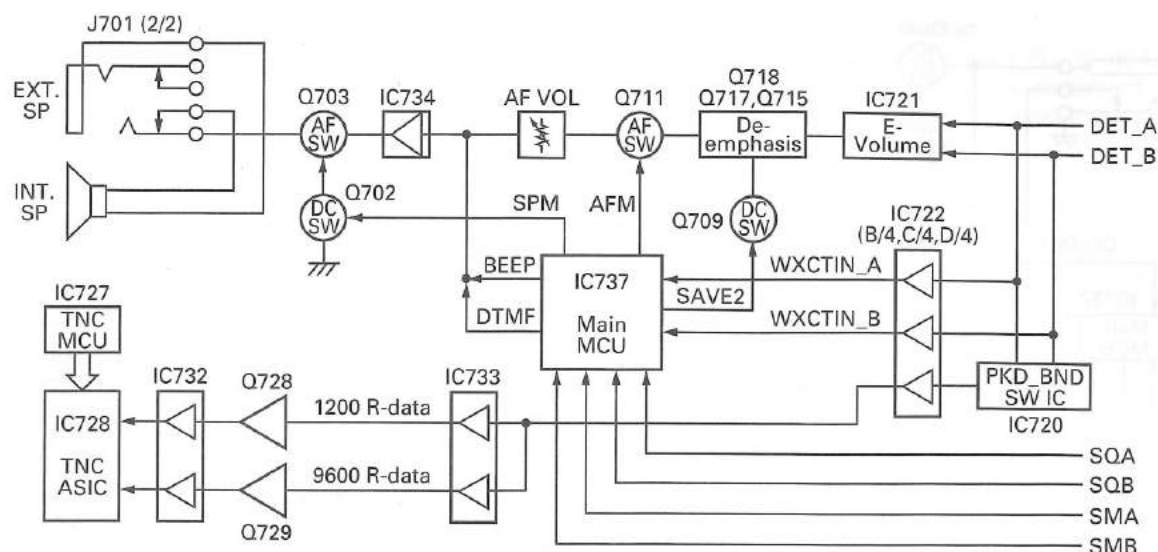


Figure 6-1 Reception AF circuit

7-2. Transmission AF circuit

■ Modulation signal circuit

The transmission AF signal from the microphone is amplified by the MIC amplifier (IC712) that accompanies the AGC amplifier (IC714), and passes the MIC MUTE switch (Q714) controlled with the Main MCU (IC737), and is input to E-volume (IC721) through the Pre-emphasis circuit (IC716) composed of the IDC and splatter-filter. The transmission AF signal that the level is adjusted here is input to VCO B as high-speed modulation signal (MOD).

The Tone and DTMF signals made from the Main MCU (IC737) are mixed with the transmission AF signal and input to E-volume (IC721) through the the pre-emphasis circuit (IC716). Similarly, the 1200bps Packet-T Data made from

the TNC ASIC (IC728) is mixed with the transmission AF signal and is input to E-volume (IC721) through the pre-emphasis circuit (IC716). On the other hand, the 9600bps Packet-T Data made from the TNC ASIC (IC728) does not pass through the pre-emphasis circuit but is input directly to E-volume (IC721). The transmission AF signal that the level is adjusted here is input to the TCXO (X511) as a low-speed modulation signal (TC).

■ VOX circuit

The transmission AF signal is amplified by the VOX amplifier (IC714), and detected with the DC-detector (D716). As a result, the obtained DC voltage is input to the Main MCU (IC737), and observes the level of the audio signal.

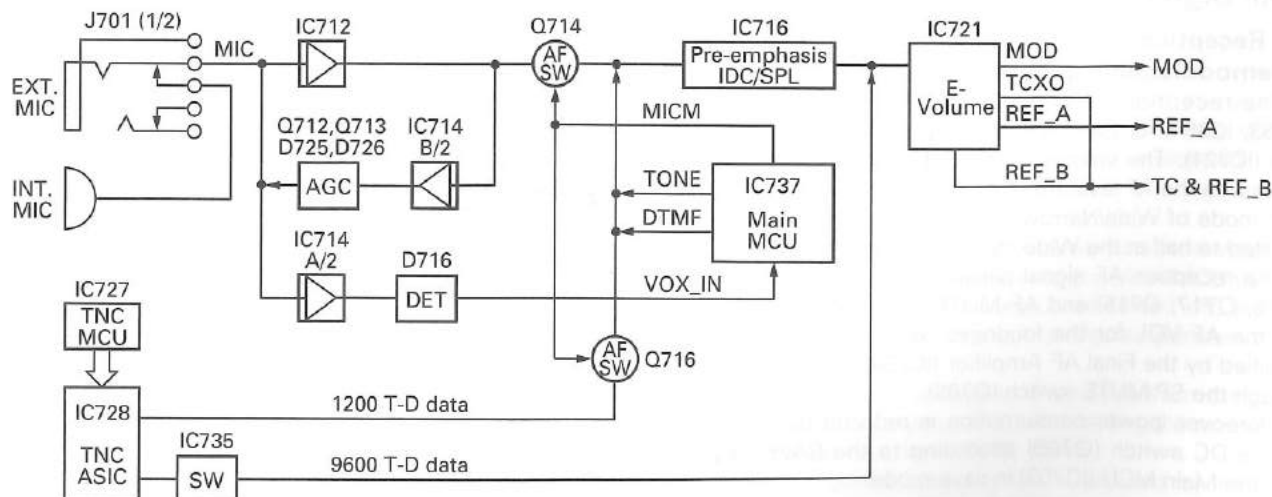


Figure 6-2 Transmission AF circuit

CIRCUIT DESCRIPTION

8. Control System

8-1. RESET, BACKUP circuit

When the supplied +B voltage falls, and the 33M voltage is detected to be lower than the threshold voltage of the RESET IC (IC726), the connected Main MCU (IC737) detects this with the interrupt terminal (/RST), backs up the data to the EEPROM ICs (IC730, IC731), and turns off the power.

8-2. LCD, LED, KEY circuit

The LCD Display is controlled by the driver built into the Main MCU (IC737). The contrast is adjusted by the regulator IC (IC701), similarly controlled by the LCDCNT signal from the Main MCU (IC737).

On the other hand, the LEDs (D710~715, D718~724) for the LCD and 16 KEY backlight are lit by the LAMP B power supply through the DC switches (Q721, Q722). The port of the Main MCU (IC737) corresponding to the 16 KEY is composed of a 5x5 matrix and detects a pressed KEY by scanning in the software.

8-3. INT-GPS control

The GPS unit installed in the equipment communicates directly with the Main MCU (IC737) and is controlled. The internal GPS power supply changes with the DC switch (Q701) controlled by the Main MCU (IC737).

8-4. RTC function

The RTC IC (IC717) that operates with the lithium battery has a clock function.

8-5. PC port

It corresponds to the connection to the external instrument (PC) through the USB connector.

8-6. COM port

To correspond to the connection with the external GPS equipment, it communicates by switching ICs (IC708, IC709) by the Main MCU (IC737) / TNC MCU (IC727) and the RS232C driver IC (IC702).

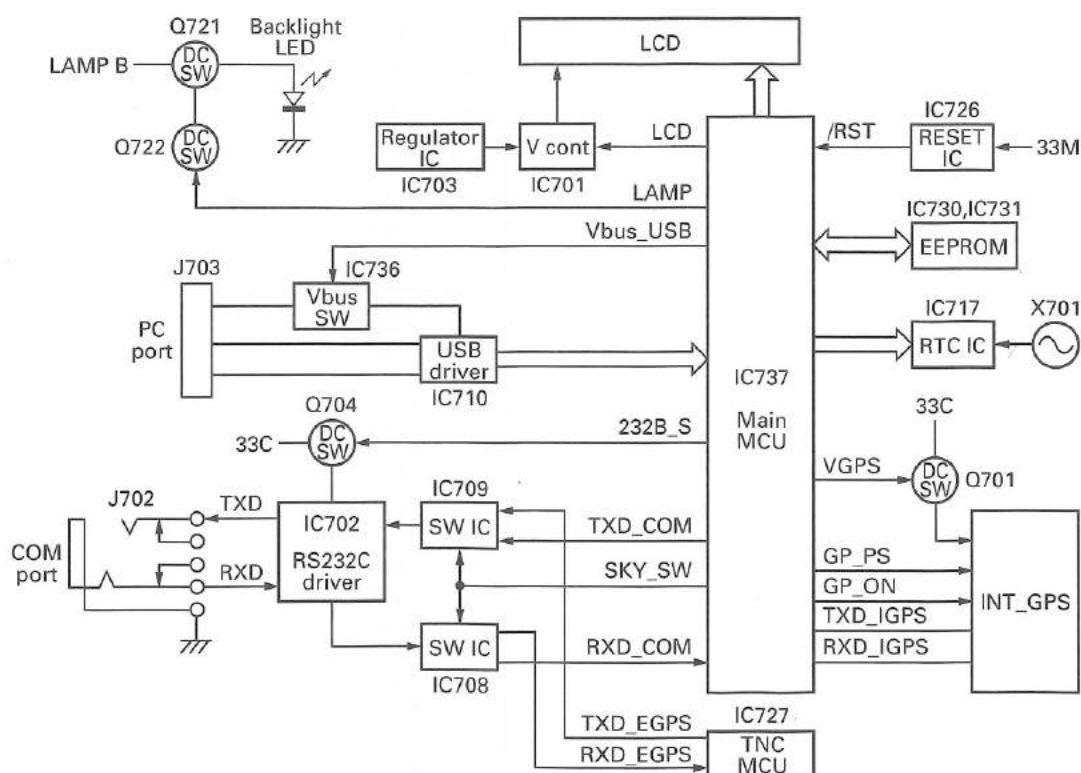


Figure 7 Control circuit

SEMICONDUCTOR DATA

Main MCU: 5F3651TDFC
(TX-RX (Control) unit (A/3) IC737)

Pin No.	Port Name	I/O	Function
1	VREF	-	Reference voltage
2	AVCC	-	VCC (3.3V Analog)
3	PKD96M	O	PKD (9600bps) data mute L: ON
4	BSFT2	O	Beat shift for TNC MCU clock H: ON
5	TNC_CAR	O	RX carrier signal input (for TNC) L: ON
6	TONE	O	Tone output
7	DTMF	O	DTMF tone output
8	SKY_SW	O	COM port signal select L: TNC, H: Main MCU
9	BSFT1	O	Beat shift for main MCU clock H: ON
10	CNT_CLK	O	Clock for electrical volume IC
11	CNT_DT	O	Data for electrical volume IC
12	DAC_EN	O	Enable for electrical volume IC L: ON
13	BYTE	-	Not used (GND)
14	CNVSS	I	Not used
15	PKTBND	O	TNC input band select L: Band A, H: Band B
16	VTX	O	TX power supply control
17	/RST	I	Reset
18	XOUT	O	System clock output (11.0592MHz)
19	VSS	-	GND
20	XIN	I	System clock input (11.0592MHz)
21	VCC	-	VCC (3.3V)
22	DAC_RST	O	Reset for electrical volume IC
23	PKS_IN	I	PKS for TNC MCU H: TX
24	DC_DET	I	DC input detection L: ON
25	INT	I	INT
26	RTS_TNC	O	RTS for TNC MCU
27	RXD_TNC	I	RXD for TNC MCU
28	CTS_TNC	I	CTS for TNC MCU
29	TXD_TNC	O	TXD for TNC MCU
30	TAB_S	O	Power supply control for RX signaling AMP L: ON
31	LCDCNT	O	LCD contrast adjustment output L: ON
32	LDA	I	Lock detection input from PLL (IC431) H: ON
33	BEEP	O	Beep output
34	RXD_COM	I	RXD for COM port
35	TXD_COM	O	TXD for COM port
36	TXD1	O	Not used

Pin No.	Port Name	I/O	Function
37	VCC	I	VCC (3.3V)
38	RXD1	I	Not used
39	VSS	-	GND
40	33TNC_S	O	Power supply control for TNC L: ON
41	SAVE2	O	RX audio filter switch H: ON
42	TXD_S	O	TXD for SUB MCU
43	RXD_S	I	RXD for SUB MCU
44	RST_S	O	Reset for SUB MCU L: ON
45	LDB	I	Lock detection input from PLL (IC513) H: ON
46	KEY_O1	O	Key matrix
47	KEY_O0	O	Key matrix
48	KEY_IT	I	Key matrix
49	KEY_I4	I	Key matrix
50	MICB_S	O	Power supply control for VOX AMP
51	RTC_SDA	I/O	Data for RTC
52	RTC_SCL	O	Clock for RTC
53	INTRTC	I	INT for RTC L: ON
54	KEY_I3	I	Key matrix
55	KEY_I2	I	Key matrix
56	KEY_I1	I	Key matrix
57	KEY_I0	I	Key matrix
58	32K_SW	O	Clock output control for RTC H: ON
59	KEY_O4	O	Key matrix
60	KEY_O3	O	Key matrix
61	KEY_O2	O	Key matrix
62	LAMP	O	Back light control H: ON
63	C_S	O	Power supply control for 33C and 47C H: ON
64	GP_ON	O	Always Low
65	TXD_IGPS	O	TXD for GPS module
66	RXD_IGPS	I	RXD for GPS module
67	GP_PS	O	Power save control for GPS module
68	VGPS	O	Power supply control for GPS module L: ON
69	/LCD_RST	O	Reset for LCD
70	/LCD_CS	O	Not used
71	/LCD_WR	O	W/R for LCD
72	A[0]	O	Data for LCD
73	D[7]	O	Data for LCD
74	D[6]	O	Data for LCD
75	D[5]	O	Data for LCD
76	D[4]	O	Data for LCD
77	D[3]	O	Data for LCD

SEMICONDUCTOR DATA

Pin No.	Port Name	I/O	Function
78	D[2]	O	Data for LCD
79	D[1]	O	Data for LCD
80	E2PCS2	O	Chip select for EEPROM (IC731)
81	E2PCL	O	Clock for EEPROM
82	E2PSI	O	Data input for EEPROM
83	E2PSO	I	Data output for EEPROM
84	E2PCS	O	Chip select for EEPROM (IC730)
85	VCC	-	VCC 3.3V
86	D[0]	O	Data for LCD
87	VSS	-	GND
88	RLEDA	O	BUSY LED control for band A
89	TLEDA	O	TX LED control for band A
90	RLEDB	O	BUSY LED control for band B
91	TLEDB	O	TX LED control for band B
92	232B_S	O	Power supply control for RS-232C driver L: ON
93	AFM	O	AF mute control L: ON
94	SPM	O	SP mute control H: ON
95	MICM	O	MIC mute control L: ON
96	ENC1	I	Encoder input 1
97	ENC2	I	Encoder input 2
98	PSW	I	Power switch input
99	Vbus_USB	O	Power supply control for USB driver H: ON
100	TXD_USB	O	TXD for USB driver IC
101	RXD_USB	I	RXD for USB driver IC
102	CTS_USB	I	CTS for USB driver IC
103	RTS_USB	O	RTS for USB driver IC
104	/SUSPEND	I	USB suspend
105	RST_USB	I/O	Reset for USB driver IC
106	MAIN_WR	I	Programming mode select
107	CHG_TH	I	Thermal detect from charge
108	BV	I	Voltage detection
109	SET	I	Set detection
110	PTT	I	PTT key input
111	AFB_S	O	Power supply control for AF AMP
112	SQ	O	Busy detect output
113	Vbus_DET	I	USB connect detection
114	TNC_WR	O	Programming mode select
115	GPSLED	I	GPS position acquisition status
116	CON	I	TNC connect flag input
117	TNC_RST	O	Reset for TNC MCU
118	STA	I	STA for TNC MCU
119	S9600	I	9600/1200 bps select

Pin No.	Port Name	I/O	Function
120	REM	I	Remote voltage input
121	VOX_IN	I	VOX level detection
122	SQA	I	SQ level A/D input band A
123	SMA	I	Signal level A/D input band A
124	SMB	I	Signal level A/D input band B
125	SQB	I	SQ level A/D input band B
126	WXCTIN_B	I	CTCSS/DCS/WX decode band B
127	AVSS	-	GND
128	WXCTIN_A	I	CTCSS/DCS/WX decode band A

Sub MCU: 78F0515AGKDXA
(TX-RX (TX-RX) unit (C/3) IC611)

Pin No.	Port Name	I/O	Function
1	DC_S	O	Output voltage select for DC/DC converter L: TX ON
2	UAIP	O	AIP control for UHF L: ON
3	VAIP	O	AIP control for VHF L: ON
4	45RVAM_S	O	RX AM power supply control L: ON
5	SGL_B	O	VCO power supply control for band B L: ON
6	45RUA_S	O	RX UHF power supply control for band A H: ON
7	33RB_S	O	RX IF power supply control for band B L: ON
8	PRE_CHG	O	Charging current control H: Normal, L: Precharge
9	45RVB_S	O	RX VHF power supply control for band B H: ON
10	45RVA_S	O	RX VHF power supply control for band A H: ON
11	45RUB_S	O	RX UHF power supply control for band B H: ON
12	OCD1B	I	Not used
13	OCD1A	I	Not used
14	LE_B	I	LE output for PLL IC (IC513) H: Lock
15	CHG	O	Charging control H: ON
16	SAVE1	O	Save switch L: Save ON
17	BTB_ON	O	Battery voltage detection switch H: ON
18	RXD6	I	Not used
19	TXD6	I	Not used
20	APCSW	O	APC discharge switch H: ON
21	TXD_S	O	Main MCU TXD
22	RXD_S	I	Main MCU RXD
23	AVREF	-	Reference voltage (3.3V)

SEMICONDUCTOR DATA

Pin No.	Port Name	I/O	Function
24	AVSS	-	GND
25	NC	-	Not used
26	BT_V	I	Battery voltage detection
27	CHGEND	I	Battery charging current detection
28	FTH	I	Thermal detect from charge
29	430TX_S	O	UHF TX power supply control H: ON
30	VHF_B	O	VCO power supply control for band B L: VHF, H: UHF
31	144TX_S	O	VHF TX power supply control H: ON
32	SHIFT_B	O	VCO shift switch for band B
33	PS_B	O	PLL power supply control for IC513 H: ON
34	PS_A	O	PLL power supply control for IC431 H: ON
35	TR_DATA	O	Data output for PLL
36	INTS	I	INT
37	B_S	O	Power supply control for 33CB L: ON
38	A_S	O	Power supply control for 33CA L: ON
39	TR_CLOCK	O	Clock output for PLL
40	RST	I	Reset
41	LE_A	O	LE output for PLL IC (IC431)
42	XT1	O	Beat shift control H: ON
43	FLMDO	-	Not used
44	SCLK	-	System clock (11.0592MHz)
45	XOUT	-	System clock output (11.0592MHz)
46	REGC	-	Bypass condenser
47	VSS	-	GND
48	VDD	-	VDD 3.3V

TNC MCU: 5F364AMDFB
(TX-RX (Control) unit (A/3) IC727)

Pin No.	Port Name	I/O	Function
1~3	NC	-	Not used
4	SIN	I	Data input
5	SCLKR	I	Clock input
6	BYTE	I	Data bus select
7	CNVSS	I	Not used
8	NC	-	Not used
9	STA	O	Data status
10	RESET	I	TNC reset
11	Xout	-	System clock output (15.9744MHz)

Pin No.	Port Name	I/O	Function
12	Vss	-	GND
13	Xin	-	System clock input (15.9744MHz)
14	VCC1	-	VCC1(3.3V)
15,16	NC	-	Not used
17	SCLKT	I	TX data clock input (for TNC ASIC)
18	SCLKR	I	RX data clock input (for TNC ASIC)
19	CON	O	TNC connect signal output
20	P80	I	Pull down
21,22	NC	-	Not used
23	GPSLED	O	EXT GPS LED output H: Active
24	NC	-	Not used
25	CTS_TNC	I	CTS (for main MCU)
26	RTS_TNC	O	RTS (for main MCU)
27	TXD_TNC	I	TXD (for main MCU)
28	RXD_TNC	O	RXD (for main MCU)
29~32	P67~P64	I	Not used
33	TXD_EGPS	O	EXT GPS TXD (COM port)
34	RXD_EGPS	I	EXT GPS RXD (COM port)
35,36	NC	-	Not used
37	CLKOUT	O	Clock output (15.9744MHz)
38	NC	-	Not used
39	P55	I	Not used
40~43	NC	-	Not used
44	P50	I	Not used
45	SQ	I	Squelch signal input L: Signal ON
46	TNC_CAR	I	RX carrier signal input (for TNC ASIC) L: Carrier ON
47	PLLLOCK	I	PLL lock signal input (for TNC ASIC)
48	FLAG	I	Flag signal input (for TNC ASIC)
49	TTX	O	TX/RX select (for TNC ASIC) H: TX, L: RX
50	S9600	O	9600/1200 bps select (for TNC ASIC) H: 9600bps, L: 1200bps
51	LOOP	O	Loop back test output (for TNC ASIC)
52	PLLCNT	O	PLL lock speed control output (for TNC ASIC)
53~59	NC	-	Not used
60	VCC2	-	VCC2 (3.3V)
61	NC	-	Not used
62	VSS2	-	GND
63,64	NC	-	Not used
65	TNC_WR	I	Not used
66	P24	I	Pull up
67	P23	I	Pull down
68	P22	I	Pull up

SEMICONDUCTOR DATA

Pin No.	Port Name	I/O	Function
69	P21	I	Pull down
70	P20	I	Pull down
71~91	NC	-	Not used
92	P102	O	Pull down
93	NC	-	Not used
94	AVSS	-	GND
95	PKS_IN	O	TNC TX/RX output H: TX, L: RX
96	VREF	-	VREF (GND)
97	AVCC	-	VCC (analog 3.3V)
98	NC	-	Not used
99	SRX	O	RXD (for TNC ASIC)
100	SCLK	I	Clock (for TNC ASIC)

Electrical Volume IC: AK2330
(TX-RX (Control) unit (A/3) IC721)

Pin No.	Pin Name	Function
1	Vin7	Band B TCXO control input
2	Vin0	TX deviation adjustment input
3	Vout0	TX deviation adjustment output for VCO
4	Vout1	TX deviation adjustment output for TCXO

Pin No.	Pin Name	Function
5	Vin1	TX deviation adjustment input
6	RSTN	Reset
7	CSN	Chip select
8	SCLK	Clock
9	SDATA	Data
10	DVdd	Vdd (3.3V Digital)
11	Vss	GND
12	Avdd	Vdd (3.3V Analog)
13	Vref	Reference voltage input
14	Vin2	Band A RX signal input
15	Vout2	Band A RX signal output
16	Vout3	Band B RX signal output
17	Vin3	Band B RX signal input
18	Vin4	BPF and APC adjustment voltage input for band B
19	Vout4	BPF and APC adjustment voltage output for band B
20	Vout5	BPF adjustment voltage output for band A
21	Vin5	BPF adjustment voltage input for band A
22	Vin6	Band A TCXO control input
23	Vout6	Band A TCXO control output
24	Vout7	Band B TCXO control output

COMPONENTS DESCRIPTION

TX-RX unit (X57-784X-XX)

Ref. No.	Use/Function	Operation/Condition/Compatibility
IC201	OP AMP	APC
IC202	RF AMP	TX AMP
IC203	OP AMP	APC
IC351	OP AMP	AM AGC
IC352	Analog switch	AM/FM select
IC353	FM system	Band A
IC354	FM system	Band B
IC431	PLL system	Band A
IC512	DC/DC converter	Charge pump for PLL
IC513	PLL system	Band B
IC514	5.3V AVR	Charge pump
IC611	SUB MCU	MCU
IC639	Voltage detector	10V for DC/DC converter
IC641	Charge	Li-ion battery
IC642	OP AMP	Charge voltage/current detect
IC643	1.5V AVR	Charge
IC644	DC/DC converter	+B
IC645	4.5V AVR	45C
IC646	3.3V AVR	33CS
IC701	OP AMP	LCD
IC702	RS-232C driver	RS-232C COM port
IC703	DC/DC converter	LCD
IC705	AVR	AFB
IC708,709	Analog switch	MCU/TNC
IC710	USB driver	USB
IC712	OP AMP	MIC AMP
IC713	Voltage detector	INT
IC714	OP AMP	VOX AMP
IC715	3.3V AVR	33M
IC716	OP AMP	MIC limiter AMP
IC717	RTC	Real-time clock
IC718	3.3V AVR	33C
IC719	4.7V AVR	47C
IC720	Analog switch	RX band A/B
IC721	D/A converter	Signal level adjust
IC722	OP AMP	RX signaling
IC724	Flip-Flops	DIVIDER
IC725	Comparator	A/D converter for TNC signal
IC726	Voltage detector	Reset
IC727	MCU	TNC
IC728	ASIC	TNC MODEM
IC730	EEPROM	Main memory

Ref. No.	Use/Function	Operation/Condition/Compatibility
IC731	EEPROM	GPS log memory
IC732	Comparator	A/D converter for TNC signal
IC733	OP AMP	TNC signal
IC734	AF power AMP	SP output
IC735	Analog switch	9600bps mute
IC736	3.3V AVR	USB IC
IC737	MCU	Main
Q1	1st mixer	UHF band B
Q2	1st mixer	VHF band A
Q3	1st mixer	UHF band A
Q4	1st mixer	VHF band B
Q5	RF AMP	UHF band B
Q6	RF AMP	UHF band A
Q7	RF AMP	VHF band A
Q8	RF AMP	VHF band B
Q9	RF AMP	UHF band B
Q10	RF AMP	UHF band A
Q11	RF AMP	VHF band A
Q12	Switch	UHF AIP
Q13	RF AMP	VHF band B
Q14	Switch	UHF AIP
Q15,16	Switch	VHF AIP
Q201,204	RF AMP	Buffer
Q205	Switch	APC
Q207	AMP	APC
Q208	DC switch	144T
Q209	DC switch	430T
Q210,211	DC switch	45TX
Q212	DC switch	APC
Q214	RF AMP	TX drive AMP
Q215	RF AMP	TX final AMP
Q352	AMP	AM
Q353	Switch	AM AGC
Q354	AMP	AM
Q355	Switch	AM AGC
Q356	AMP	AM
Q357	RF AMP	2nd local AMP
Q358	IF AMP	Band A
Q359	IF AMP	Band B
Q433	AMP	Ripple filter
Q434	RF AMP	Band A PLL
Q435	Oscillator	Band A VCO
Q436~438	RF AMP	Buffer

COMPONENTS DESCRIPTION

Ref. No.	Use/Function	Operation/Condition/Compatibility
Q512	AMP	Ripple filter
Q518	Switch	VCO shift
Q521	RF AMP	Band B PLL
Q522,523	Oscillator	Band B VCO
Q524	RF AMP	Buffer
Q611	DC switch	45RUB
Q612,613	DC switch	45RVA
Q614	DC switch	45RVB
Q615	DC switch	45RVAM
Q616	DC switch	33RB
Q642	Switch	DC DET
Q643	AMP	Li-ion battery charge
Q644	DC switch	Band B VCO
Q645	Switch	Over voltage protector
Q646,648	Switch	Li-ion battery charge
Q649	Switch	Over voltage protector
Q650	Switch	DC/DC converter
Q651	DC switch	33CS
Q652	DC switch	45C
Q653	Switch	Li-ion battery charge
Q654	DC switch	33CB
Q655	AVR	33C
Q656	AVR	45C
Q657	DC switch	33CA
Q658	AVR	45C
Q659	AVR	33C
Q660	DC switch	Band B PLL
Q661	DC switch	Band B VCO
Q662	Switch	Charge voltage detect
Q663	Switch	DC/DC converter
Q664	Switch	Beat shift
Q701	DC switch	33GP
Q702,703	Switch	SP mute
Q704	DC switch	RS-232C
Q707	DC switch	MIC AMP
Q708	DC switch	T/R LED band B
Q709	Switch	RX signal
Q710	DC switch	T/R LED band A
Q711	Switch	AF mute
Q712,713	AMP	MIC AGC
Q714	Switch	MIC mute
Q715	AMP	RX signal
Q716	Switch	MIC mute

Ref. No.	Use/Function	Operation/Condition/Compatibility
Q717,718	AMP	RX signal
Q719	Switch	IDC
Q720	Switch	TAB
Q721,722	AVR	Lamp
Q723,724	Switch	Beat shift
Q725	Switch	33TNC
Q726~729	AMP	TNC
Q730	Switch	GPS
D5	RF switch	VHF band B 1st local
D6	RF switch	VHF band A 1st local
D7	RF switch	UHF band B 1st local
D8,9	BPF tuning	UHF band B
D10,11	BPF tuning	UHF band A
D12,13	BPF tuning	VHF band A
D14,15	BPF tuning	VHF band B
D16,17	BPF tuning	UHF band B
D18,19	BPF tuning	UHF band A
D20,21	BPF tuning	UHF band B
D22,23	BPF tuning	UHF band A
D24,25	BPF tuning	VHF band A
D26,27	BPF tuning	VHF band B
D28,29	BPF tuning	UHF band B
D30,31	BPF tuning	UHF band A
D32,33	BPF tuning	VHF band A
D35,36	BPF tuning	VHF band B
D38	BPF tuning	UHF band B
D39	BPF tuning	UHF band A
D40	BPF tuning	UHF band B
D41	BPF tuning	UHF band A
D42,43	BPF tuning	VHF band A
D44,45	BPF tuning	VHF band B
D201	RF switch	UHF TX
D202	RF switch	VHF TX
D203	RF switch	RX band B
D204	RF switch	UHF TX
D205	RF switch	VHF TX
D209	Reverse current protector	APC
D210	Constant voltage	APC
D211	RF switch	VHF TX
D212,214	RF switch	UHF TX
D215,216	RF switch	VHF TX
D217	RF switch	UHF TX

COMPONENTS DESCRIPTION

Ref. No.	Use/Function	Operation/Condition/Compatibility
D219	RF switch	VHF TX
D220	RF switch	UHF TX
D221	RF switch	VHF TX
D222	RF switch	UHF TX
D223	Switch	VHF TX
D225,226	Switch	TX protector
D227	RF switch	VHF TX
D228	Switch	VHF TX
D351	Current steering	AM
D352	Switch	AM
D432,433	Speed up	Band A PLL
D434,435	Frequency control	Band A VCO
D436	Speed up	Ripple filter
D437	RF switch	UHF band A 1st local
D511	Speed up	DC/DC converter
D513	Speed up	Ripple filter
D514,515	Speed up	Band B PLL
D516,517	RF switch	Band B PLL
D518	RF switch	VFO shift
D519~522	Frequency control	Band B VCO
D523,524	Modulator	Band B VCO
D525	RF switch	VCO shift
D643	Constant voltage	Voltage protector

Ref. No.	Use/Function	Operation/Condition/Compatibility
D644	Reverse current protector	DC-IN
D645	Constant voltage	Voltage protector
D646	Reverse current protector	
D647	Constant voltage	Voltage protector
D648	Voltage shift	
D649	Current steering	DC/DC converter
D650	Reverse current protector	
D701~705	Surge protection	
D706	Speed up	SP mute
D707	Switch	SP mute
D709	LED	TX/Busy
D710~715	LED	Back light
D716	Current steering	VOX
D717	LED	TX/Busy
D718~723	LED	Back light
D725,726	Current steering	VOX
D727	Reverse current protector	Back up battery
D729~739	Reverse current protector	16 key
D740	Constant voltage	Lamp B
D741	Reverse current protector	

TERMINAL FUNCTION

TX-RX unit (X57-784X-XX) (A/3): Control

Pin No.	Pin Name	I/O	Function
CN701 (to GPS module, encoder volume)			
1	GP_ON	O	Not used
2	33GP	O	GPS power supply (3.3V)
3	RXD_IGPS	I	RXD for GPS
4	TXD_IGPS	O	TXD for GPS
5	GP_PS	O	GPS save control
6	AFVI	O	Audio input to volume
7	AFVO	I	Audio output from volume
8	GND	-	GND
9	NC	-	Not used
10	GP_BU	O	GPS backup power supply
11	GND	-	GND

Pin No.	Pin Name	I/O	Function
12	ENC1	I	Encoder input 1
13	GND	-	GND
14	ENC2	I	Encoder input21
CN703 (to LCD module)			
1	/CS	O	Chip select for LCD
2	/RES	O	Reset for LCD
3	A[0]	O	D[0]~D[7] output select
4	/WR	O	WR for LCD
5	D[0]	O	Data output
6	D[1]	O	Data output
7	D[2]	O	Data output
8	D[3]	O	Data output
9	D[4]	O	Data output

Pin No.	Pin Name	I/O	Function
10	D[5]	O	Data output
11	D[6]	O	Data output
12	D[7]	O	Data output
13	VDD	O	Power supply (3.3V)
14	VSS	O	GND
15	VDD	O	Power supply (3.3V)
16	V1	I	Power supply V1
17	V2	I	Power supply V2
18	V3	I	Power supply V3
19	V4	I	Power supply V4
20	V5	O	Power supply V5
CN715 (to FPC ASSY)			
1	KEY_O3	O	Key matrix
2	KEY_O2	O	Key matrix
3	KEY_O0	O	Key matrix
4	KEY_I4	I	Key matrix
5	KEY_O1	O	Key matrix
6	SPI	O	SP AF output
7	SPG	O	SP GND
8	MICG	I	MIC GND
9	MICI	I	MIC audio input
10	PSW	I	Power key
11	GND	-	GND
12	LAMP B	O	Back light power supply
13	KEY_I2	I	Key matrix
14	KEY_I3	I	Key matrix
15	KEY_O4	I	Key matrix
CN719 (to PTT section)			
1	PTT	I	PTT KEY
2	GND	-	GND
3	KEY_I0	I	Key matrix
4	KEY_O4	O	Key matrix
5	KEY_I1	I	Key matrix
6	CHG_TH	I	Thermal detect for charge
J702 (EXT. COM Port)			
1	TXD	O	TXD for RS-232C
2	RXD	I	RXD for RS-232C
3	GND	-	GND
J703 (EXT. USB Port)			
1	V BUS	I	Power supply from PC
2	D-	I/O	12Mbps data (full speed)
3	D+	I/O	12Mbps data (full speed)
4	NC	-	Not used
5	GND	-	GND

TX-RX unit (X57-784X-XX) (C/3, A/3) : TX-RX, Control

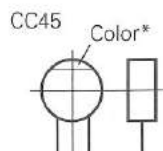
CN611 Pin No.	CN731 Pin No.	Name	Function
CN611 - CN731 (TX-RX to Control)			
1	26	C_S	Unit power supply control
2	25	GND	GND
3	24	RXD_S	RXD for Sub MCU control
4	23	TXD_S	TXD for Sub MCU control
5	22	DC_DET	DC input detection
6	21	VTX	4.5V TX power supply control
7	20	MOD	Modulation signal
8	19	REF_A	VC control for TCXO (X431)
9	18	LDB	Unlock detection input from PLL (IC513)
10	17	DET_B	Band B RX detect signal
11	16	SOB	Band B squelch voltage
12	15	SMB	Band B RSSI voltage
13	14	BPFA	Band A BPF tuning voltage
14	13	APC&BPFB	Band B BPF tuning/APC voltage
15	12	SMA	Band A RSSI voltage
16	11	SQA	Band A squelch voltage
17	10	DET_A	Band A RX detect signal
18	9	LDA	Unlock detection input from PLL (IC431)
19	8	TC&REF_B	VC control for TCXO (X511)
20	7	RST_S	Reset for sub MCU
21	6	B	+B power supply
22	5	B	+B power supply
23	4	B	+B power supply
24	3	NC	Not used
25	2	GND	GND
26	1	NC	Not used

PARTS LIST

CAPACITORS

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

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



• Capacitor value

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

2 2 0 = 22pF
Multiplier
2nd number
1st number

• Temperature coefficient

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

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

Example : CC45TH = -470±60ppm/°C

• Tolerance (More than 10pF)

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

(Less than 10pF)

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

• Voltage rating

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

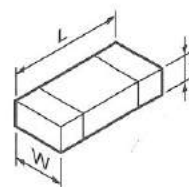
• Chip capacitors

(EX) CC 73 F SL 1H 000 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) CK 73 F F 1H 000 Z
1 2 3 4 5 6 7
(Chip) (B, F)

- Refer to the table above.
1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

• Dimension



Chip capacitor

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

Chip resistor

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

RESISTORS

• Chip resistor (Carbon)

(EX) RD 73 E B 2B 000 J
1 2 3 4 5 6 7
(Chip) (B, F)

• Carbon resistor (Normal type)

(EX) RD 14 B B 2C 000 J
1 2 3 4 5 6 7

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

• Rating wattage

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

PARTS LIST

* New Parts. Δ indicates safety critical components.

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

L : Scandinavia

Y : PX (Far East, Hawaii)

C : China

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

TH-D72A/D72E

TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
TH-D72A/D72E					
1	1B		A02-4092-13	PLASTIC CABINET ASSY	
3	3A		A10-4137-01	CHASSIS	
4	3B		A62-1175-02	PANEL (TOP/REAR)	
6	1B		B09-0736-03	CAP (SP/MIC)	
7	1B	*	B10-2797-12	FRONT GLASS	
8	2B		B11-1872-02	ILLUMINATION GUIDE (LCD)	
9	2B		B11-1873-04	ILLUMINATION GUIDE (TX/BUSY)	
10	2B		B11-1884-04	FILTER (LCD)	
11	1B		B38-0923-05	LCD ASSY (LCD)	
12	1D		B62-2235-00	INSTRUCTION MANUAL	
12	1D		B62-2236-00	INSTRUCTION MANUAL	E
14	2A		E04-0482-05	RF COAXIAL RECEPTACLE (SMA)	
15	3A		E23-1343-04	GROUND TERMINAL	
16	3A		E29-1227-04	TERMINAL (BATTERY)	
17	2A		E29-1228-04	TERMINAL (ANT)	
18	1D		E30-7380-05	CORD WITH CONNECTOR (USB)	
19	2C		E30-7696-05	AC POWER CORD	E
20	2A		E37-1477-05	FLAT CABLE (26PIN)	
22	2A		G02-1863-04	EARTH SPRING (DC IN)	
24	1A		G11-4503-04	RUBBER CUSHION (SP)	
25	3A		G11-4504-04	SHEET (PTT)	
26	2A		G11-4547-04	SHEET (LED)	
27	2A	*	G11-4551-04	SHEET (FPC 26P)	
28	2A		G13-1933-04	CUSHION (SP/MIC)	
32	3A		G53-1842-04	PACKING (TERMINAL)	
33	1A		G53-1843-01	PACKING (CHASSIS)	
34	3B		G53-1844-02	PACKING (TOP)	
35	3A		G53-1848-03	PACKING (SP/MIC/USB)	
37	2D	*	H12-4289-01	PACKING FIXTURE	
38	3C	*	H52-2371-02	ITEM CARTON CASE	K
38	3C	*	H52-2372-02	ITEM CARTON CASE	E
40	1A		J19-5535-02	HOLDER (SP)	
41	2A		J19-5536-03	HOLDER (TERMINAL)	
42	1B		J21-8618-03	MOUNTING HARDWARE (LCD)	
44	2D		J29-0709-14	BELT CLIP ASSY ACCESSORY	
45	2A	*	J32-0954-14	CYLINDRICAL BOSS	
46	3A		J87-0027-05	FPC (LEAD FREE) (PTT)	
47	1A	*	J87-0035-05	FPC (LEAD FREE) (SP/MIC)	
48	3A	*	J87-0036-15	FPC (LEAD FREE) (GPS/VOL)	
49	1A,1B		J99-0714-04	ADHESIVE SHEET (LCD)	
50	3A		J99-0749-04	ADHESIVE SHEET (GPS UNIT)	
51	2A		J99-0761-04	ADHESIVE SHEET (SMA)	
53	1B		K29-9457-03	KNOB (PTT)	
54	1B		K29-9458-03	KNOB (VOL)	
55	1B		K29-9459-13	KNOB (ENC)	
56	1B		K29-9460-03	BUTTON KNOB (PTT/MON/LAMP)	
57	1A		K29-9464-03	BUTTON KNOB (CROSS)	
B	1A		N09-6549-04	STEPPED SCREW (SP HOLDER)	
C	2A		N09-6554-05	PAN HEAD SCREW (SMA)	
D	3A		N14-0853-04	CIRCULAR NUT (VOL/ENC)	
E	2A		N35-2004-43	BINDING HEAD MACHINE SCREW	
F	2A,1B		N79-2035-48	PAN HEAD TAPTITE SCREW (PCB)	
TX-RX UNIT (X57-784X-XX) 0-11: K, 2-71: E					
G	2A		N79-2050-43	PAN HEAD TAPTITE SCREW (FET)	
H	3A		N80-2610-43	PAN HEAD TAPTITE (SCREW CASE)	
VR1	3A		R39-0604-05	VARIABLE RESISTOR (VOL/ENC)	
59	1A		T07-0266-25	SPEAKER	
60	1C		T90-1087-05	WHIP ANTENNA ACCESSORY	
61	1A		T91-0579-05	MIC ELEMENT	
62	1C		T93-0145-05	CD-ROM ACCESSORY	
64	3A		W02-3747-05	GPS MODULE	
65	2D		W08-1216-05	AC ADAPTER ACCESSORY	K
66	2C,2D		W08-1218-05	AC ADAPTER ACCESSORY	E
BA1			W09-0971-05	LITHIUM CELL	
67	2C		W09-1064-05	BATTERY ASSY (1800mAh)	
D709			B30-2278-05	LED (RED/YELLOW)	
D710-715			B30-2215-05	LED (YELLOW)	
D717			B30-2278-05	LED (RED/YELLOW)	
D718-723			B30-2215-05	LED (YELLOW)	
C1-4			CK73HB1A104K	CHIP C 0.10UF K	
C8			CK73HB1H471K	CHIP C 470PF K	
C15			CK73HB1H102K	CHIP C 1000PF K	
C17			CK73HB1H102K	CHIP C 1000PF K	
C19			CK73HB1A104K	CHIP C 0.10UF K	
C21			CC73HCH1H030B	CHIP C 3.0PF B	
C24			CK73HB1H102K	CHIP C 1000PF K	
C25			CC73HCH1H020B	CHIP C 2.0PF B	
C28			CK73HB1A104K	CHIP C 0.10UF K	
C29			CC73HCH1H020B	CHIP C 2.0PF B	
C30			CC73HCH1H030B	CHIP C 3.0PF B	
C31			CC73HCH1H471J	CHIP C 470PF J	
C33			CK73HB1A104K	CHIP C 0.10UF K	
C34			CC73HCH1H020B	CHIP C 2.0PF B	
C35			CK73HB1H471K	CHIP C 470PF K	
C37			CK73HB1A104K	CHIP C 0.10UF K	
C38			CK73HB1H471K	CHIP C 470PF K	
C39			CK73HB1H102K	CHIP C 1000PF K	
C40			CK73HB1H471K	CHIP C 470PF K	
C41			CC73HCH1H050B	CHIP C 5.0PF B	
C42			CK73HB1A104K	CHIP C 0.10UF K	
C44			CK73HB1A104K	CHIP C 0.10UF K	
C46,47			CC73HCH1H030B	CHIP C 3.0PF B	
C48			CC73HCH1H020B	CHIP C 2.0PF B	
C49,50			CK73HB1H102K	CHIP C 1000PF K	
C53,54			CK73HB1H102K	CHIP C 1000PF K	
C55			CC73HCH1H471J	CHIP C 470PF J	
C58,59			CC73HCH1H020B	CHIP C 2.0PF B	
C60			CK73HB1H102K	CHIP C 1000PF K	
C62			CC73HCH1H050B	CHIP C 0.5PF B	
C63			CK73HB1H102K	CHIP C 1000PF K	
C64			CC73HCH1H120G	CHIP C 12PF G	
C65			CC73HCH1H1R5B	CHIP C 1.5PF B	
C66,67			CK73HB1H471K	CHIP C 470PF K	
C68,69			CK73HB1H102K	CHIP C 1000PF K	

K : TH-D72A

E : TH-D72E

PARTS LIST

TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C70,71			CC73HCH1H020B	CHIP C 2.0PF B		C219			CK73HB1H102K	CHIP C 1000PF K	E
C74,75			CC73HCH1H010B	CHIP C 1.0PF B		C221-223			CK73HB1H102K	CHIP C 1000PF K	
C76,77			CC73HCH1H050B	CHIP C 5.0PF B		C224,225			CK73HB1H471K	CHIP C 470PF K	
C78-80			CK73HB1E103K	CHIP C 0.010UF K		C226			CK73HB1E103K	CHIP C 0.010UF K	
C81-84			CK73HB1H471K	CHIP C 470PF K		C227,228			CK73HB1H471K	CHIP C 470PF K	
C85			CK73HB1E103K	CHIP C 0.010UF K		C229			CK73HB1H102K	CHIP C 1000PF K	
C86,87			CC73HCH1H070B	CHIP C 7.0PF B		C230			CC73HCH1H100D	CHIP C 10PF D	
C88,89			CK73HB1H102K	CHIP C 1000PF K		C231			CK73HB1H102K	CHIP C 1000PF K	
C90,91			CK73HB1H471K	CHIP C 470PF K		C232,233			CK73HB1H471K	CHIP C 470PF K	
C92			CC73HCH1H020B	CHIP C 2.0PF B		C235,236			CK73HB1H471K	CHIP C 470PF K	
C93-95			CK73HB1H102K	CHIP C 1000PF K		C237			CK73HB1H102K	CHIP C 1000PF K	
C96			CC73HCH1H050B	CHIP C 5.0PF B		C238			CK73HB1A154K	CHIP C 0.15UF K	
C97			CK73HB1H102K	CHIP C 1000PF K		C239			CC73HCH1H150J	CHIP C 15PF J	
C98-101			CK73HB1H471K	CHIP C 470PF K		C240			CK73HB1H471K	CHIP C 470PF K	
C102,103			CK73HB1H102K	CHIP C 1000PF K		C241,242			CK73HB1H102K	CHIP C 1000PF K	
C104,105			CK73HB1H471K	CHIP C 470PF K		C243			CC73HCH1H471J	CHIP C 470PF J	
C107			CK73HB1H471K	CHIP C 470PF K		C244,245			CK73HB1H471K	CHIP C 470PF K	
C108,109			CK73HB1H102K	CHIP C 1000PF K		C246			CK73HB1H102K	CHIP C 1000PF K	
C111-113			CK73HB1H102K	CHIP C 1000PF K		C247			CK73HB1H471K	CHIP C 470PF K	
C114-117			CK73HB1H471K	CHIP C 470PF K		C248			CC73HCH1H101J	CHIP C 100PF J	
C118,119			CK73HB1H102K	CHIP C 1000PF K		C249			CK73HB1H102K	CHIP C 1000PF K	
C120,121			CC73HCH1H020B	CHIP C 2.0PF B		C250			CK73HB1E103K	CHIP C 0.010UF K	
C122,123			CC73HCH1H050B	CHIP C 5.0PF B		C251			CK73HB1H102K	CHIP C 1000PF K	
C126			CK73HB1H471K	CHIP C 470PF K		C253			CS77CP1A100M	CHIP TNL 10UF 10WV	
C127			CC73HCH1H070B	CHIP C 7.0PF B		C254			CK73HB1H471K	CHIP C 470PF K	
C129			CK73HB1H471K	CHIP C 470PF K		C255			CK73HB1E103K	CHIP C 0.010UF K	
C130			CC73HCH1H070B	CHIP C 7.0PF B		C256			CC73HCH1H101J	CHIP C 100PF J	
C131,132			CK73HB1H471K	CHIP C 470PF K		C257			CK73HB1H471K	CHIP C 470PF K	
C136,137			CK73HB1H102K	CHIP C 1000PF K		C258			CC73HCH1H100B	CHIP C 10PF B	
C138			CK73HB1H471K	CHIP C 470PF K		C259			CK73HB1E103K	CHIP C 0.010UF K	
C140			CK73HB1H471K	CHIP C 470PF K		C260			CC73HCH1H471J	CHIP C 470PF J	
C141,142			CK73HB1H102K	CHIP C 1000PF K		C261			CS77CP1A100M	CHIP TNL 10UF 10WV	
C144			CK73HB1H102K	CHIP C 1000PF K		C262			CC73HCH1H101J	CHIP C 100PF J	
C145-148			CK73HB1H471K	CHIP C 470PF K		C263			CK73HB1E103K	CHIP C 0.010UF K	
C149-151			CK73HB1H102K	CHIP C 1000PF K		C264,265			CC73HCH1H471J	CHIP C 470PF J	
C152,153			CK73HB1H471K	CHIP C 470PF K		C266			CK73HB1H102K	CHIP C 1000PF K	
C154,155			CK73HB1H102K	CHIP C 1000PF K		C267			CK73HB1H471K	CHIP C 470PF K	
C157,158			CK73HB1H102K	CHIP C 1000PF K		C268			CK73HB1E103K	CHIP C 0.010UF K	
C159,160			CK73HB1H471K	CHIP C 470PF K		C269			CK73HB1H102K	CHIP C 1000PF K	
C161			CC73HCH1H560J	CHIP C 56PF J		C270			CK73HB1E103K	CHIP C 0.010UF K	
C162,163			CK73HB1H102K	CHIP C 1000PF K		C271			CK73HB1H471K	CHIP C 470PF K	
C164			CC73HCH1H020B	CHIP C 2.0PF B		C272,273			CC73HCH1H471J	CHIP C 470PF J	
C165			CC73HCH1H820J	CHIP C 82PF J		C274			CC73GCH1H270J	CHIP C 27PF J	
C166			CC73HCH1H030B	CHIP C 3.0PF B		C275			CC73GCH1H330J	CHIP C 33PF J	
C167			CC73HCH1H150G	CHIP C 15PF G		C276			CC73GCH1H060B	CHIP C 6.0PF B	
C168			CC73HCH1H181J	CHIP C 180PF J		C277			CC73GCH1H390J	CHIP C 39PF J	
C169			CC73HCH1H270G	CHIP C 27PF G		C278			CC73GCH1H390G	CHIP C 39PF G	
C170			CK73HB1H471K	CHIP C 470PF K		C279			CC73GCH1H390J	CHIP C 39PF J	
C171			CC73HCH1H1R5B	CHIP C 1.5PF B		C280,281			CK73HB1H471K	CHIP C 470PF K	
C201			CC73HCH1H1R5B	CHIP C 1.5PF B		C282			CK73HB1A104K	CHIP C 0.10UF K	
C202			CC73HCH1H100D	CHIP C 10PF D		C283			CC73GCH1H330J	CHIP C 33PF J	
C204			CC73HCH1H330J	CHIP C 33PF J		C284			CC73GCH1H560J	CHIP C 56PF J	
C205			CK73HB1H471K	CHIP C 470PF K		C285			CC73GCH1H101J	CHIP C 100PF J	
C206,207			CK73HB1H102K	CHIP C 1000PF K		C286			CC73GCH1H270G	CHIP C 27PF G	
C210			CC73HCH1H120G	CHIP C 12PF G		C287			CK73GB1E105K	CHIP C 1.0UF K	
C212			CC73HCH1H100D	CHIP C 10PF D		C288			CC73GCH1H560J	CHIP C 56PF J	
C214			CC73HCH1H220G	CHIP C 22PF G		C289			CC73GCH1H070B	CHIP C 7.0PF B	
C216			CC73HCH1H100D	CHIP C 10PF D		C290			CC73GCH1H470J	CHIP C 47PF J	
C217			CC73HCH1H080B	CHIP C 8.0PF B		C291			CC73HCH1H470J	CHIP C 47PF J	
C218			CC73HCH1H180G	CHIP C 18PF G		C292			CK73HB1H102K	CHIP C 1000PF K	

PARTS LIST

TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C293			CC73GCH1H270J	CHIP C 27PF J		C382,383			CK73HB1A104K	CHIP C 0.10UF K	
C294			CK73HB1H102K	CHIP C 1000PF K		C384			CC73HCH1H101J	CHIP C 100PF J	
C295			CC73GCH1H101J	CHIP C 100PF J		C385			CC73HCH1H220G	CHIP C 22PF G	
C296			CK73HB1E103K	CHIP C 0.010UF K		C386			CK73HB1A104K	CHIP C 0.10UF K	
C297			CC73GCH1H102J	CHIP C 1000PF J		C387			CK73GB1E105K	CHIP C 1.0UF K	
C299			CC73HCH1H470J	CHIP C 47PF J		C388			CC73HCH1H050C	CHIP C 5.0PF C	
C300			CK73GB1H102K	CHIP C 1000PF K		C389,390			CK73HB1A104K	CHIP C 0.10UF K	
C301,302			CC73GCH1H471J	CHIP C 470PF J		C391			CC73HCH1H101J	CHIP C 100PF J	
C303			CC73GCH1H102J	CHIP C 1000PF J		C392,393			CK73HB1A104K	CHIP C 0.10UF K	
C304			CC73GCH1H220J	CHIP C 22PF J		C394			CC73HCH1H220G	CHIP C 22PF G	
C305			CC73GCH1H390J	CHIP C 39PF J		C395			CK73HB1A104K	CHIP C 0.10UF K	
C307			CC73GCH1H102J	CHIP C 1000PF J		C396			CK73GB1E105K	CHIP C 1.0UF K	
C308			CC73GCH1H020B	CHIP C 2.0PF B		C397,398			CK73HB1A104K	CHIP C 0.10UF K	
C309			CC73GCH1H270J	CHIP C 27PF J		C399			CC73HCH1H090D	CHIP C 9.0PF D	
C310			CC73GCH1H220J	CHIP C 22PF J		C400,401			CK73HB1A104K	CHIP C 0.10UF K	
C311			CC73GCH1H070B	CHIP C 7.0PF B		C402			CC73HCH1H180J	CHIP C 18PF J	
C312			CC73HCH1H471J	CHIP C 470PF J		C403			CK73HB1H102K	CHIP C 1000PF K	
C313			CC73HCH1H180J	CHIP C 18PF J		C404			CC73HCH1H090D	CHIP C 9.0PF D	
C314			CC73GCH1H020B	CHIP C 2.0PF B		C405			CK73HB1A104K	CHIP C 0.10UF K	
C315			CC73GCH1H220J	CHIP C 22PF J		C406			CS77CP1A100M	CHIP TNL 10UF 10WV	
C316			CC73GCH1H560G	CHIP C 56PF G		C407,408			CK73HB1A104K	CHIP C 0.10UF K	
C317			CC73GCH1H220J	CHIP C 22PF J		C409			CK73HB1H102K	CHIP C 1000PF K	
C318			CC73GCH1H080B	CHIP C 8.0PF B		C411			CS77CP1A100M	CHIP TNL 10UF 10WV	
C319			CC73HCH1H180J	CHIP C 18PF J		C412			CK73HB1A104K	CHIP C 0.10UF K	
C320			CC73GCH1H120G	CHIP C 12PF G		C414,415			CK73HB1A104K	CHIP C 0.10UF K	
C321			CC73GCH1H220J	CHIP C 22PF J		C416,417			CC73HCH1H120G	CHIP C 12PF G	
C323			CC73GCH1H220G	CHIP C 22PF G		C418,419			CK73HB1A104K	CHIP C 0.10UF K	
C325			CC73GCH1H040B	CHIP C 4.0PF B		C423,424			CC73HCH1H0R5B	CHIP C 0.5PF B	
C326			CC73GCH1H020B	CHIP C 2.0PF B		C425			CC73HCH1H1R5B	CHIP C 1.5PF B	
C327			CC73GCH1H080B	CHIP C 8.0PF B		C431			CK73HB1H471K	CHIP C 470PF K	
C328,329			CC73GCH1H020B	CHIP C 2.0PF B		C432			CK73HB1A104K	CHIP C 0.10UF K	
C331			C93-0758-05	CHIP C 27PF J		C433			CK73HB1E103K	CHIP C 0.010UF K	
C332			CC73GCH1H1R5B	CHIP C 1.5PF B		C434			CC73HCH1H030B	CHIP C 3.0PF B	
C333			CC73GCH1H020B	CHIP C 2.0PF B		C435			CC73HCH1H060B	CHIP C 6.0PF B	
C334			CC73GCH1H030B	CHIP C 3.0PF B		C436			CK73HB1E103K	CHIP C 0.010UF K	
C336			CC73GCH1H040B	CHIP C 4.0PF B		C437			C93-1803-05	CHIP C 10UF M	
C351			CK73HB1A104K	CHIP C 0.10UF K		C438			CK73HB1H471K	CHIP C 470PF K	
C352			CK73HB1E104K	CHIP C 0.10UF K		C439			CS77CP1A100M	CHIP TNL 10UF 10WV	
C353			CK73HB1A104K	CHIP C 0.10UF K		C440			CK73HB1H102K	CHIP C 1000PF K	
C355			CK73HB1A104K	CHIP C 0.10UF K		C442			CK73HB1H102K	CHIP C 1000PF K	
C356			CK73HB1H102K	CHIP C 1000PF K		C444			CK73HB1H102K	CHIP C 1000PF K	
C357			CK73HB1A104K	CHIP C 0.10UF K		C445			CS77CA1VR22M	CHIP TNL 0.22UF 35WV	
C358			CK73HB1H102K	CHIP C 1000PF K		C446			CK73HB1H102K	CHIP C 1000PF K	
C360			CK73HB1A105K	CHIP C 1.0UF K		C447			CC73HCH1H070B	CHIP C 7.0PF B	
C361			CC73HCH1H560J	CHIP C 56PF J		C448			CS77CP1A4R7M	CHIP TNL 4.7UF 10WV	
C362			CK73HB1H102K	CHIP C 1000PF K		C449			CC73HCH1H010B	CHIP C 1.0PF B	
C363			CK73HB1E103K	CHIP C 0.010UF K		C450			CS77CA1VR22M	CHIP TNL 0.22UF 35WV	
C364			CK73HB1A104K	CHIP C 0.10UF K		C451			CC73HCH1H050B	CHIP C 5.0PF B	
C366,367			CK73HB1A104K	CHIP C 0.10UF K		C452			CC73HCH1H220G	CHIP C 22PF G	
C368			CK73HB1A105K	CHIP C 1.0UF K		C453			CS77CA1VR22M	CHIP TNL 0.22UF 35WV	
C369,370			CK73HB1A104K	CHIP C 0.10UF K		C454			CC73HCH1H030B	CHIP C 3.0PF B	
C371			CK73HB1A105K	CHIP C 1.0UF K		C455			CK73HB1H102K	CHIP C 1000PF K	
C372			CK73HB1A104K	CHIP C 0.10UF K		C456			CC73HCH1H050B	CHIP C 5.0PF B	
C373			CC73HCH1H101J	CHIP C 100PF J		C457			CC73HCH1H070B	CHIP C 7.0PF B	
C374			CK73HB1H102K	CHIP C 1000PF K		C458			CC73HCH1H090B	CHIP C 9.0PF B	
C375			CK73HB1E103K	CHIP C 0.010UF K		C459			CK73HB1H102K	CHIP C 1000PF K	
C376,377			CC73HCH1H181J	CHIP C 180PF J		C460			CC73HCH1H270G	CHIP C 27PF G	
C378			CC73HCH1H101J	CHIP C 100PF J		C461			CC73HCH1H100D	CHIP C 10PF D	
C379			CK73HB1H102K	CHIP C 1000PF K		C462			CK73HB1H471K	CHIP C 470PF K	
C380,381			CC73HCH1H181J	CHIP C 180PF J		C463			CC73HCH1H101J	CHIP C 100PF J	

PARTS LIST

TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C464			CC73HCH1H820J	CHIP C 82PF J		C554			CC73HCH1H150G	CHIP C 15PF G	
C465			CC73HCH1H120J	CHIP C 12PF J		C556			CK73HB1H102K	CHIP C 1000PF K	
C466			CS77CA1A220M	CHIP TNTL 22UF 10WV		C557			CC73HCH1H030B	CHIP C 3.0PF B	
C467			CC73HCH1H010B	CHIP C 1.0PF B		C558			CC73HCH1H180G	CHIP C 18PF G	
C469,470			CK73HB1H102K	CHIP C 1000PF K		C559			CK73HB1H102K	CHIP C 1000PF K	
C471,472			CC73HCH1H150G	CHIP C 15PF G		C561			CK73HB1H471K	CHIP C 470PF K	
C473			CC73HCH1H050C	CHIP C 5.0PF C		C562			CC73HCH1H220G	CHIP C 22PF G	
C475			CK73HB1H102K	CHIP C 1000PF K		C563			CC73HCH1H100B	CHIP C 10PF B	
C476			CC73HCH1H0R5B	CHIP C 0.5PF B		C564			CK73HB1H102K	CHIP C 1000PF K	
C477			CK73HB1H102K	CHIP C 1000PF K		C565			CK73HB1E103K	CHIP C 0.010UF K	
C479			CK73HB1H102K	CHIP C 1000PF K		C566			CK73HB1H471K	CHIP C 470PF K	
C480			CK73HB1A104K	CHIP C 0.10UF K		C567			CC73HCH1H220G	CHIP C 22PF G	
C481			CC73HCH1H220J	CHIP C 22PF J		C569			CC73HCH1H680G	CHIP C 68PF G	
C482			CK73HB1H102K	CHIP C 1000PF K		C571			CC73HCH1H010B	CHIP C 1.0PF B	
C483			CK73HB1H221K	CHIP C 220PF K		C572			CC73HCH1H050B	CHIP C 5.0PF B	
C484			CC73HCH1H050B	CHIP C 5.0PF B		C573			CK73HB1C223K	CHIP C 0.022UF K	
C485			CC73HCH1H220G	CHIP C 22PF G		C574			CC73HCH1H020C	CHIP C 2.0PF C	
C486			CK73HB1E103K	CHIP C 0.010UF K		C575			CC73HCH1H0R5B	CHIP C 0.5PF B	
C487			CK73HB1H471K	CHIP C 470PF K		C576			CC73HCH1H390G	CHIP C 39PF G	
C488			CK73HB1A104K	CHIP C 0.10UF K		C577			CK73HB1A474K	CHIP C 0.47UF K	
C489			CC73HCH1H100C	CHIP C 10PF C		C578			CK73HB1C223K	CHIP C 0.022UF K	
C490			CK73HB1H471K	CHIP C 470PF K		C579			CC73HCH1H030B	CHIP C 3.0PF B	
C491			CK73HB1E103K	CHIP C 0.010UF K		C580			CC73HCH1H0R5B	CHIP C 0.5PF B	
C492			CK73HB1H102K	CHIP C 1000PF K		C581			CK73HB1H471K	CHIP C 470PF K	
C493,494			CK73HB1H471K	CHIP C 470PF K		C582			CC73HCH1H070B	CHIP C 7.0PF B	
C495			CC73HCH1H100C	CHIP C 10PF C		C583			CC73HCH1H120G	CHIP C 12PF G	
C496			CC73HCH1H080B	CHIP C 8.0PF B		C584			CC73HCH1H090B	CHIP C 9.0PF B	
C497			CC73HCH1H100D	CHIP C 10PF D		C585			CC73HCH1H030B	CHIP C 3.0PF B	
C498			CC73HCH1H030B	CHIP C 3.0PF B		C587			CC73HCH1H0R5B	CHIP C 0.5PF B	
C499			CC73HCH1H220J	CHIP C 22PF J		C588			CK73HB1H102K	CHIP C 1000PF K	
C511-514			CS77CP1A100M	CHIP TNTL 10UF 10WV		C589			CC73HCH1H0R5B	CHIP C 0.5PF B	
C515			CK73HB1H471K	CHIP C 470PF K		C590			CK73HB1H102K	CHIP C 1000PF K	
C517			CK73HB1H471K	CHIP C 470PF K		C594			CC73HCH1H220J	CHIP C 22PF J	
C520			CK73HB1H102K	CHIP C 1000PF K		C595			CK73HB1H102K	CHIP C 1000PF K	
C521			CK73HB1A104K	CHIP C 0.10UF K		C611,612			CK73HB1H102K	CHIP C 1000PF K	
C522			CK73HB1H102K	CHIP C 1000PF K		C614,615			CK73HB1H102K	CHIP C 1000PF K	
C523			CK73HB1E103K	CHIP C 0.010UF K		C616			CK73HB1H471K	CHIP C 470PF K	
C524			CS77CP1A100M	CHIP TNTL 10UF 10WV		C617			CK73HB1H102K	CHIP C 1000PF K	
C526			CS77CP1A100M	CHIP TNTL 10UF 10WV		C618			CK73HB1A105K	CHIP C 1.0UF K	
C527			CC73HCH1H030B	CHIP C 3.0PF B		C619			CK73HB1E103K	CHIP C 0.010UF K	
C528			CS77CA1A220M	CHIP TNTL 22UF 10WV		C620			CK73GB0J106K	CHIP C 10UF K	
C529			C93-1803-05	CHIP C 10UF M		C621-631			CK73HB1H102K	CHIP C 1000PF K	
C530			CK73HB1H471K	CHIP C 470PF K		C621-633			CK73HB1H102K	CHIP C 1000PF K	
C531			CC73HCH1H060B	CHIP C 6.0PF B		C633			CK73HB1H102K	CHIP C 1000PF K	
C532			CK73HB1H102K	CHIP C 1000PF K		C634			CK73FB1C106K	CHIP C 10UF K	
C533,534			CK73HB1E103K	CHIP C 0.010UF K		C635,636			CK73HB1H471K	CHIP C 470PF K	
C535			CK73HB1H102K	CHIP C 1000PF K		C637	*		CK73EB1C226M	CHIP C 22UF M	
C536			CK73GB1E105K	CHIP C 1.0UF K		C638			CC73HCH1H220J	CHIP C 22PF J	
C539			CK73HB1H102K	CHIP C 1000PF K		C641			CK73HB1H102K	CHIP C 1000PF K	
C540			CC73HCH1H101J	CHIP C 100PF J		C642			CC73HCH1H101J	CHIP C 100PF J	
C541			CS77CP1A100M	CHIP TNTL 10UF 10WV		C643-648			CK73HB1H102K	CHIP C 1000PF K	
C542			CK73HB1H102K	CHIP C 1000PF K		C649			CK73HB1E103K	CHIP C 0.010UF K	
C544			CS77CA1VR22M	CHIP TNTL 0.22UF 35WV		C650			CK73GB1H104K	CHIP C 0.10UF K	
C545,546			CK73HB1H102K	CHIP C 1000PF K		C651	*		CK73EB1C226M	CHIP C 22UF M	
C547			CS77CA1VR22M	CHIP TNTL 0.22UF 35WV		C652			CK73HB1A105K	CHIP C 1.0UF K	
C548,549			CK73HB1H102K	CHIP C 1000PF K		C653			CK73EB1E106K	CHIP C 10UF K	
C550			CS77CP1A4R7M	CHIP TNTL 4.7UF 10WV		C654			CK73HB1A105K	CHIP C 1.0UF K	
C551			CK73HB1H102K	CHIP C 1000PF K		C655			CK73HB1H471K	CHIP C 470PF K	
C552			CC73HCH1H080B	CHIP C 8.0PF B		C656			CK73EB1E106K	CHIP C 10UF K	
C553			CS77CA1VR22M	CHIP TNTL 0.22UF 35WV		C657			CK73GB1H104K	CHIP C 0.10UF K	

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TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C658			CK73EB1E106K	CHIP C 10UF K		C742			CK73HB1H102K	CHIP C 1000PF K	E
C659			CK73GB1E105K	CHIP C 1.0UF K		C743			CK73HB1A105K	CHIP C 1.0UF K	
C660			CK73GB1H104K	CHIP C 0.10UF K		C744-746			CS77CP1C2R2M	CHIP TNL 2.2UF 16WV	
C661			CC73HCH1H151J	CHIP C 150PF J		C747			CK73HB1H102K	CHIP C 1000PF K	
C662			CK73FB1C106K	CHIP C 10UF K		C748			CK73HB1A104K	CHIP C 0.10UF K	
C663,664			CK73GB1H104K	CHIP C 0.10UF K		C749			CK73GB1E105K	CHIP C 1.0UF K	
C665			CK73FB1C106K	CHIP C 10UF K		C750			CK73HB1H471K	CHIP C 470PF K	
C666			CK73HB1H102K	CHIP C 1000PF K		C751,752			CK73HB1A105K	CHIP C 1.0UF K	
C667			CK73FB1C106K	CHIP C 10UF K		C753			CK73GB0J225K	CHIP C 2.2UF K	
C668			CK73HB1H102K	CHIP C 1000PF K		C754,755			CK73HB1H102K	CHIP C 1000PF K	E
C669			CK73GB1H104K	CHIP C 0.10UF K		C756			CK73HB1A105K	CHIP C 1.0UF K	
C670			CK73FB1C106K	CHIP C 10UF K		C757			CK73GB1E105K	CHIP C 1.0UF K	
C671,672			CK73HB1H102K	CHIP C 1000PF K		C758,759			CK73HB1A104K	CHIP C 0.10UF K	
C673			CK73GB1H104K	CHIP C 0.10UF K		C760			CK73HB1H471K	CHIP C 470PF K	
C674			CK73HB1A105K	CHIP C 1.0UF K		C761-763			CK73HB1A105K	CHIP C 1.0UF K	
C675			CK73HB1H102K	CHIP C 1000PF K		C764			CK73HB1H102K	CHIP C 1000PF K	
C676			CS77CP0J4R7M	CHIP TNL 4.7UF 6.3WV		C765			CK73HB1A104K	CHIP C 0.10UF K	
C677-679			CK73HB1H102K	CHIP C 1000PF K		C766-768			CK73HB1H471K	CHIP C 470PF K	
C681			CK73HB1H102K	CHIP C 1000PF K		C769			CK73HB1H102K	CHIP C 1000PF K	
C682			CS77CP0J4R7M	CHIP TNL 4.7UF 6.3WV		C771			C93-1803-05	CHIP C 10UF M	
C683,684			CK73HB1A104K	CHIP C 0.10UF K		C772-774			CK73HB1E562K	CHIP C 5600PF K	
C685-687			CK73HB1H102K	CHIP C 1000PF K		C775			CK73HB1E103K	CHIP C 0.010UF K	
C688			CK73HB1H102K	CHIP C 1000PF K		C776			CK73HB1H102K	CHIP C 1000PF K	
C689			CK73HB1H102K	CHIP C 1000PF K		C777			CK73HB1H471K	CHIP C 470PF K	
C691			CK73HB1H102K	CHIP C 1000PF K		C778			CK73HB1A105K	CHIP C 1.0UF K	
C693,694			CK73HB1H102K	CHIP C 1000PF K		C779			CK73HB1H471K	CHIP C 470PF K	
C695			CC73HCH1H090B	CHIP C 9.0PF B		C781			CK73GB0J225K	CHIP C 2.2UF K	
C698			CC73HCH1H101J	CHIP C 100PF J		C782			CK73HB1C153K	CHIP C 0.015UF K	
C701			CS77CC0J101M	CHIP TNL 100UF 6.3WV		C783			CC73HCH1H390J	CHIP C 39PF J	
C702			CK73HB1H102K	CHIP C 1000PF K		C784			CK73HB1E562K	CHIP C 5600PF K	
C703			CK73HB1H471K	CHIP C 470PF K		C785			CK73HB1C153K	CHIP C 0.015UF K	
C704			CK73EB1E106K	CHIP C 10UF K		C786-789			CK73HB1H471K	CHIP C 470PF K	
C705			CK73HB1E103K	CHIP C 0.010UF K		C790			CK73HB1H222K	CHIP C 2200PF K	
C706			CK73HB1A224K	CHIP C 0.22UF K		C791			CK73HB1H471K	CHIP C 470PF K	
C707			CK73HB1E103K	CHIP C 0.010UF K		C792-794			CK73HB1A104K	CHIP C 0.10UF K	
C708,709			CK73HB1A104K	CHIP C 0.10UF K		C795			CK73HB1A105K	CHIP C 1.0UF K	
C710			CK73HB1H471K	CHIP C 470PF K		C796			CK73HB1A224K	CHIP C 0.22UF K	
C711,712			CC73HCH1H101J	CHIP C 100PF J		C797,798			CK73HB1H102K	CHIP C 1000PF K	
C713			CK73GB1H104K	CHIP C 0.10UF K		C799			CK73HB1H471K	CHIP C 470PF K	
C714			CK73HB1A104K	CHIP C 0.10UF K		C800			CK73GB1H104K	CHIP C 0.10UF K	
C715			CK73HB1A105K	CHIP C 1.0UF K		C801			CK73HB1A104K	CHIP C 0.10UF K	
C716			CK73HB1A104K	CHIP C 0.10UF K		C802			CK73HB1C223K	CHIP C 0.022UF K	
C717,718			CK73GB1E105K	CHIP C 1.0UF K		C804,805			CK73HB1H471K	CHIP C 470PF K	
C719			CK73HB1A104K	CHIP C 0.10UF K		C806,807			CK73HB1A105K	CHIP C 1.0UF K	
C720			CC73HCH1H101J	CHIP C 100PF J		C808			CK73HB1C473K	CHIP C 0.047UF K	
C721			CK73HB1H471K	CHIP C 470PF K		C809			CK73HB1E562K	CHIP C 5600PF K	
C722			CK73HB1A104K	CHIP C 0.10UF K		C810			CK73HB1A393K	CHIP C 0.039UF K	
C723			CC73HCH1H101J	CHIP C 100PF J		C811			CK73HB1A154K	CHIP C 0.15UF K	
C724			CK73HB1A104K	CHIP C 0.10UF K		C812,813			CK73HB1E103K	CHIP C 0.010UF K	
C725-727			CK73GB1E105K	CHIP C 1.0UF K		C814			CK73HB1H471K	CHIP C 470PF K	
C728			CK73HB1H471K	CHIP C 470PF K		C815,816			CC73HCH1H040C	CHIP C 4.0PF C	
C729			CC73HCH1H221J	CHIP C 220PF J		C817			CK73HB1A104K	CHIP C 0.10UF K	
C730,731			CK73HB1A104K	CHIP C 0.10UF K		C818			CK73HB1H471K	CHIP C 470PF K	
C732			CK73HB1H102K	CHIP C 1000PF K		C819			CK73GB1H104K	CHIP C 0.10UF K	
C734			CK73HB1A104K	CHIP C 0.10UF K		C820			CK73HB1A105K	CHIP C 1.0UF K	
C735			CK73HB1H102K	CHIP C 1000PF K	E	C821			CK73HB1H471K	CHIP C 470PF K	
C736,737			CK73GB1H104K	CHIP C 0.10UF K		C822			CK73HB1H102K	CHIP C 1000PF K	
C738			CK73HB1H471K	CHIP C 470PF K		C823			CK73FB1E475K	CHIP C 4.7UF K	
C739			CK73GB1H104K	CHIP C 0.10UF K		C824			CK73HB1H561K	CHIP C 560PF K	
C740			CK73HB1H471K	CHIP C 470PF K	K	C825			CK73HB1H472K	CHIP C 4700PF K	
C740,741			CK73HB1H471K	CHIP C 470PF K	E						

K: TH-D72A

E: TH-D72E

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C826			CC73HCH1H181J	CHIP C 180PF J		C910			CC73HCH1H010B	CHIP C 1.0PF B	
C827			CK73HB1C473K	CHIP C 0.047UF K		C911			CC73HCH1H070B	CHIP C 7.0PF B	
C829			CK73HB1H471K	CHIP C 470PF K		C912			CK73HB1A104K	CHIP C 0.10UF K	
C830			CS77CA1VR33M	CHIP TANTL 0.33UF 35WV		C913			CK73HB1H102K	CHIP C 1000PF K	
C831			C93-1803-05	CHIP C 10UF M		C914			CC73HCH1H390G	CHIP C 39PF G	
C832			CK73HB1H471K	CHIP C 470PF K		C915			CK73HB1A104K	CHIP C 0.10UF K	
C833			CK73HB1H472K	CHIP C 4700PF K		C916,917			CK73HB1H471K	CHIP C 470PF K	
C834			CK73HB1H102K	CHIP C 1000PF K		C918			CK73HB1A104K	CHIP C 0.10UF K	
C835			CK73HB1H472K	CHIP C 4700PF K		C919			CK73HB1H102K	CHIP C 1000PF K	
C836			CK73HB1A473K	CHIP C 0.047UF K		C920,921			CK73HB1A104K	CHIP C 0.10UF K	
C837			CK73HB1E103K	CHIP C 0.010UF K		C922,923			CK73HB1H102K	CHIP C 1000PF K	
C838			CK73HB1H332K	CHIP C 3300PF K		C924,925			CK73HB1H332K	CHIP C 3300PF K	
C839			CK73HB1H182K	CHIP C 1800PF K		C926			CS77CP1A100M	CHIP TANTL 10UF 10WV	
C840			CK73HB1A104K	CHIP C 0.10UF K		C927			CK73HB1A104K	CHIP C 0.10UF K	
C841			CK73HB1H102K	CHIP C 1000PF K		C928			CK73HB1H471K	CHIP C 470PF K	
C843			CK73HB1H561K	CHIP C 560PF K		C929			CK73HB1A104K	CHIP C 0.10UF K	
C844,845			C93-1803-05	CHIP C 10UF M		C930			CK73HB1E562K	CHIP C 5600PF K	
C846			CK73HB1H471K	CHIP C 470PF K		C932			CK73HB1E103K	CHIP C 0.010UF K	
C847			CK73HB1H472K	CHIP C 4700PF K		C933			CK73HB1H102K	CHIP C 1000PF K	
C848,849			CK73HB1H471K	CHIP C 470PF K		C934			CK73HB1A104K	CHIP C 0.10UF K	
C850			CK73GB1E105K	CHIP C 1.0UF K		C935,936			CS77CD0G221M	CHIP TANTL 220UF 4WV	
C851			CK73HB1H471K	CHIP C 470PF K		C937			CK73HB1A104K	CHIP C 0.10UF K	
C852			CK73HB1H102K	CHIP C 1000PF K		C938			CK73HB1E103K	CHIP C 0.010UF K	
C853			CK73HB1C123K	CHIP C 0.012UF K		C939			CK73HB1A104K	CHIP C 0.10UF K	
C854,855			CK73HB1H471K	CHIP C 470PF K		C940			CK73HB1E103K	CHIP C 0.010UF K	
C856			CK73HB1A104K	CHIP C 0.10UF K		C941			CK73HB1C682K	CHIP C 6800PF K	
C857			CS77CP1A100M	CHIP TANTL 10UF 10WV		C942			CK73HB1C223K	CHIP C 0.022UF K	
C858,859			CK73HB1A104K	CHIP C 0.10UF K		C944			CK73HB1H102K	CHIP C 1000PF K	
C860			CK73HB1A105K	CHIP C 1.0UF K		C945,946			CK73HB1A104K	CHIP C 0.10UF K	
C861			CK73HB1H471K	CHIP C 470PF K		C947			CK73HB1H102K	CHIP C 1000PF K	
C862-864			CK73HB1H102K	CHIP C 1000PF K		C948			CK73HB1C682K	CHIP C 6800PF K	
C865,866			CK73GB0J475K	CHIP C 4.7UF K		C949,950			CK73HB1C223K	CHIP C 0.022UF K	
C867-869			CK73HB1H471K	CHIP C 470PF K		C951			CK73HB1H102K	CHIP C 1000PF K	
C870			C93-1803-05	CHIP C 10UF M		C952			CK73GB1E105K	CHIP C 1.0UF K	
C872			CK73HB1H221K	CHIP C 220PF K		C953			CK73HB1H102K	CHIP C 1000PF K	
C873			CK73GB0J475K	CHIP C 4.7UF K		C954			CK73HB1H472K	CHIP C 4700PF K	
C874			CK73HB1A104K	CHIP C 0.10UF K		C955			CK73HB1H471K	CHIP C 470PF K	
C875			CK73HB1H102K	CHIP C 1000PF K		C956			CK73HB1A105K	CHIP C 1.0UF K	
C876			CK73GB0J475K	CHIP C 4.7UF K		C957			CK73HB1E103K	CHIP C 0.010UF K	
C877,878			CK73HB1E103K	CHIP C 0.010UF K		C958			CK73HB1A104K	CHIP C 0.10UF K	
C880			CK73HB1H102K	CHIP C 1000PF K		C959			CK73HB1E103K	CHIP C 0.010UF K	
C881			CK73HB1H471K	CHIP C 470PF K		C960			CK73HB1H222K	CHIP C 2200PF K	
C882			CK73HB1A104K	CHIP C 0.10UF K		C961			CK73HB1H221K	CHIP C 220PF K	
C883			CK73HB1H102K	CHIP C 1000PF K		C962			CK73HB1H102K	CHIP C 1000PF K	
C884			CK73HB1H221K	CHIP C 220PF K		C963			CK73HB1A105K	CHIP C 1.0UF K	
C886			CC73HCH1H470G	CHIP C 47PF G		C964			CC73HCH1H101J	CHIP C 100PF J	
C887			CK73HB1H472K	CHIP C 4700PF K		C965,966			CK73HB1H102K	CHIP C 1000PF K	
C888			CK73HB1H102K	CHIP C 1000PF K		C967			CK73HB1C682K	CHIP C 6800PF K	
C889			CK73GB0J475K	CHIP C 4.7UF K		C968,969			CK73HB1A105K	CHIP C 1.0UF K	
C890-893			CC73HCH1H101J	CHIP C 100PF J		C970			CK73HB1A473K	CHIP C 0.047UF K	
C894			CK73HB1H102K	CHIP C 1000PF K		C971			C93-1803-05	CHIP C 10UF M	
C895			CC73HCH1H101J	CHIP C 100PF J		C972			CK73HB1A104K	CHIP C 0.10UF K	
C897			CK73GB0J475K	CHIP C 4.7UF K		C973			C93-1803-05	CHIP C 10UF M	
C898			CK73HB1C223K	CHIP C 0.022UF K		C975			CK73HB1A105K	CHIP C 1.0UF K	
C899			C93-1803-05	CHIP C 10UF M		C976			C93-1803-05	CHIP C 10UF M	
C900			CC73HCH1H050C	CHIP C 5.0PF C		C986			CK73HB1H471K	CHIP C 470PF K	
C901-904			CK73HB1H102K	CHIP C 1000PF K		C987			CK73HB1H102K	CHIP C 1000PF K	
C905			CK73HB1E103K	CHIP C 0.010UF K		C989			CK73HB1A104K	CHIP C 0.10UF K	
C906,907			CK73HB1H102K	CHIP C 1000PF K		C990			C93-1803-05	CHIP C 10UF M	
C908,909			CC73HCH1H100D	CHIP C 10PF D							

PARTS LIST

TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
CN205-210			E23-1278-05	TERMINAL (2P)		L70			L41-6878-03	SMALL FIXED INDUCTOR (68NH)	
CN611			E40-6880-05	FLAT CABLE CONNECTOR (26P)		L72			L41-6878-03	SMALL FIXED INDUCTOR (68NH)	
CN701			E40-6754-05	FLAT CABLE CONNECTOR (14P)		L73			L41-3378-03	SMALL FIXED INDUCTOR (33NH)	
CN703			E40-6755-05	FLAT CABLE CONNECTOR (20P)		L74			L41-3978-03	SMALL FIXED INDUCTOR (39NH)	
CN715			E40-6844-05	FLAT CABLE CONNECTOR (15P)		L75,76			L41-2788-03	SMALL FIXED INDUCTOR (270NH)	
CN718,719			E40-6883-05	FLAT CABLE CONNECTOR (6P)		L77			L41-1878-03	SMALL FIXED INDUCTOR (18NH)	
CN731			E40-6880-05	FLAT CABLE CONNECTOR (26P)		L78			L41-1578-03	SMALL FIXED INDUCTOR (15NH)	
J641			E03-0190-05	DC JACK		L79			L41-5678-03	SMALL FIXED INDUCTOR (56NH)	
J701			E11-0703-05	PHONE JACK (SP/MIC)		L80			L41-3988-14	SMALL FIXED INDUCTOR (390NH)	
J702			E11-0709-05	2.5D PHONE JACK		L81			L41-1578-03	SMALL FIXED INDUCTOR (15NH)	
J703			E58-0079-05	RECTANGULAR RECEPTACLE		L82			L41-5678-03	SMALL FIXED INDUCTOR (56NH)	
F201			F01-1032-15	RADIATION PLATE		L83			L41-3385-14	SMALL FIXED INDUCTOR (330NH)	
F641			F53-0327-15	FUSE (4.0A)		L201			L40-8275-71	SMALL FIXED INDUCTOR (82NH)	
F642			F53-0360-05	FUSE (0.25A)		L202			L40-2275-71	SMALL FIXED INDUCTOR (22NH)	
F643			F53-0327-15	FUSE (4.0A)		L204			L40-2275-71	SMALL FIXED INDUCTOR (22NH)	
F701			F53-0363-05	FUSE (0.5A)		L206			L41-1285-03	SMALL FIXED INDUCTOR (120NH)	
F702			F53-0367-05	FUSE (1.0A)		L207			L40-1575-71	SMALL FIXED INDUCTOR (15NH)	
CN712			J19-5386-05	BATTERY HOLDER (BA1)		L209,210			L41-1085-03	SMALL FIXED INDUCTOR (100NH)	
CD351			L79-1848-05	TUNING COIL (450KHZ)		L211			L41-3978-03	SMALL FIXED INDUCTOR (39NH)	
CD352			L79-1834-05	TUNING COIL (455KHZ)		L212			L41-1078-03	SMALL FIXED INDUCTOR (10NH)	
CF351			L72-1044-05	CERAMIC FILTER (455KHZ)		L213			L41-3985-03	SMALL FIXED INDUCTOR (390NH)	
CF352			L72-1016-05	CERAMIC FILTER (450KHZ)		L214			L41-2285-03	SMALL FIXED INDUCTOR (220NH)	
L5			L40-8281-86	SMALL FIXED INDUCTOR (0.82UH)		L215			L41-3985-03	SMALL FIXED INDUCTOR (390NH)	
L12			L40-8281-86	SMALL FIXED INDUCTOR (0.82UH)		L216			L41-2285-03	SMALL FIXED INDUCTOR (220NH)	
L13			L40-8275-71	SMALL FIXED INDUCTOR (82NH)		L217			L41-1578-03	SMALL FIXED INDUCTOR (15NH)	
L14			L40-2275-71	SMALL FIXED INDUCTOR (22NH)		L218			L41-1078-03	SMALL FIXED INDUCTOR (10NH)	
L16			L40-8275-71	SMALL FIXED INDUCTOR (82NH)		L219			L41-6875-03	SMALL FIXED INDUCTOR (68NH)	
L17			L40-2275-71	SMALL FIXED INDUCTOR (22NH)		L220			L41-1581-03	SMALL FIXED INDUCTOR (1.5NH)	
L19,20			L40-1085-71	SMALL FIXED INDUCTOR (100NH)		L221			L41-6875-03	SMALL FIXED INDUCTOR (68NH)	
L21,22			L41-1578-03	SMALL FIXED INDUCTOR (15NH)		L223			L41-2275-03	SMALL FIXED INDUCTOR (22NH)	
L23,24			L41-2288-03	SMALL FIXED INDUCTOR (220NH)		L226			L40-1275-71	SMALL FIXED INDUCTOR (12NH)	
L25			L41-1278-03	SMALL FIXED INDUCTOR (12NH)		L227			L41-2285-03	SMALL FIXED INDUCTOR (220NH)	
L26			L41-1878-03	SMALL FIXED INDUCTOR (18NH)		L228			L41-3985-39	SMALL FIXED INDUCTOR (0.39UH)	
L27			L41-5678-03	SMALL FIXED INDUCTOR (56NH)		L229			L41-2285-39	SMALL FIXED INDUCTOR (0.22UH)	
L28			L41-1278-03	SMALL FIXED INDUCTOR (12NH)		L230			L41-3678-55	SMALL FIXED INDUCTOR (36NH)	
L29			L41-1878-03	SMALL FIXED INDUCTOR (18NH)		L231			L41-2285-03	SMALL FIXED INDUCTOR (220NH)	
L30			L41-3988-14	SMALL FIXED INDUCTOR (390NH)		L232			L41-1005-39	SMALL FIXED INDUCTOR (10UH)	
L31			L41-5678-03	SMALL FIXED INDUCTOR (56NH)		L233			L34-4577-05	AIR-CORE COIL (9T)	
L32			L41-3988-14	SMALL FIXED INDUCTOR (390NH)		L234			L34-4604-15	AIR-CORE COIL (3T)	
L33,34			L41-2788-03	SMALL FIXED INDUCTOR (270NH)		L235			L34-4603-15	AIR-CORE COIL (2T)	
L38			L41-1578-03	SMALL FIXED INDUCTOR (15NH)		L236			L34-4577-05	AIR-CORE COIL (9T)	
L40			L41-1578-03	SMALL FIXED INDUCTOR (15NH)		L237,238			L34-4689-05	AIR-CORE COIL (3T)	
L42			L41-1578-03	SMALL FIXED INDUCTOR (15NH)		L239			L34-4577-05	AIR-CORE COIL (9T)	
L44			L41-1578-03	SMALL FIXED INDUCTOR (15NH)		L240,241			L34-4604-15	AIR-CORE COIL (3T)	
L46			L41-5678-03	SMALL FIXED INDUCTOR (56NH)		L242			L34-4577-05	AIR-CORE COIL (9T)	
L48			L41-5678-03	SMALL FIXED INDUCTOR (56NH)		L243			L34-4573-05	AIR-CORE COIL (5T)	
L49,50			L41-1278-03	SMALL FIXED INDUCTOR (12NH)		L244			L34-4577-05	AIR-CORE COIL (9T)	
L51			L41-1878-03	SMALL FIXED INDUCTOR (18NH)		L245			L34-4576-05	AIR-CORE COIL (8T)	
L52			L41-5678-03	SMALL FIXED INDUCTOR (56NH)		L246			L34-4577-05	AIR-CORE COIL (9T)	
L53			L41-1878-03	SMALL FIXED INDUCTOR (18NH)		L248			L34-4572-05	AIR-CORE COIL (4T)	
L54			L41-3988-14	SMALL FIXED INDUCTOR (390NH)		L249			L34-4576-05	AIR-CORE COIL (8T)	
L56			L41-5678-03	SMALL FIXED INDUCTOR (56NH)		L250			L34-4577-05	AIR-CORE COIL (9T)	
L58			L41-3988-14	SMALL FIXED INDUCTOR (390NH)		L251,252			L34-4572-05	AIR-CORE COIL (4T)	
L59,60			L41-1578-03	SMALL FIXED INDUCTOR (15NH)		L253			L41-1278-03	SMALL FIXED INDUCTOR (12NH)	
L62			L41-1578-03	SMALL FIXED INDUCTOR (15NH)		L254			L34-4572-05	AIR-CORE COIL	
L64			L41-1578-03	SMALL FIXED INDUCTOR (15NH)		L351,352			L41-3388-03	SMALL FIXED INDUCTOR (330NH)	
L66			L41-2288-03	SMALL FIXED INDUCTOR (220NH)		L420,421			L40-1291-86	SMALL FIXED INDUCTOR (1.2UH)	
L68			L41-2288-03	SMALL FIXED INDUCTOR (220NH)		L431			L41-3988-14	SMALL FIXED INDUCTOR (390NH)	
						L432			L40-1875-71	SMALL FIXED INDUCTOR (18NH)	
						L433			L40-1085-71	SMALL FIXED INDUCTOR (100NH)	

PARTS LIST

TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
L434			L40-1275-71	SMALL FIXED INDUCTOR (12NH)		CP31,32			RK74HB1J103J	CHIP-COM 10K J 1/16W	
L435			L40-1001-86	SMALL FIXED INDUCTOR (10UH)		CP33-38			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L436			L40-2775-71	SMALL FIXED INDUCTOR (27NH)		CP40			RK74HB1J102J	CHIP-COM 1.0K J 1/16W	
L437			L40-1001-86	SMALL FIXED INDUCTOR (10UH)		CP42,43			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L438			L40-3975-71	SMALL FIXED INDUCTOR (39NH)		CP44-47			RK74HB1J102J	CHIP-COM 1.0K J 1/16W	
L439			L40-6865-71	SMALL FIXED INDUCTOR (6.8NH)		CP49-50			RK74HB1J473J	CHIP-COM 47K J 1/16W	
L440			L41-2278-08	SMALL FIXED INDUCTOR (22NH)		CP51			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L441,442			L40-1001-86	SMALL FIXED INDUCTOR (10UH)		CP52-54			RK74HB1J102J	CHIP-COM 1.0K J 1/16W	
L443			L40-8275-71	SMALL FIXED INDUCTOR (82NH)		CP55			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L444			L40-1075-71	SMALL FIXED INDUCTOR (10NH)		CP56-67			RK74HB1J102J	CHIP-COM 1.0K J 1/16W	
L445			L40-4775-71	SMALL FIXED INDUCTOR (47NH)		CP68			RK75HA1J473J	CHIP-COM 47K J 1/16W	
L446			L41-2775-03	SMALL FIXED INDUCTOR (27NH)		CP69-73			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L447			L41-2275-01	SMALL FIXED INDUCTOR (22NH)		CP74			RK74HB1J473J	CHIP-COM 47K J 1/16W	
L448			L41-2775-01	SMALL FIXED INDUCTOR (27NH)		CP75			RK75HA1J473J	CHIP-COM 47K J 1/16W	
L511			L41-3988-14	SMALL FIXED INDUCTOR (390NH)		CP76			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L512			L40-1575-71	SMALL FIXED INDUCTOR (15NH)		CP77,78			RK75HA1J101J	CHIP-COM 100 J 1/16W	
L513			L40-1275-71	SMALL FIXED INDUCTOR (12NH)		R1			RK73HB1J222J	CHIP R 2.2K J 1/16W	
L514,515			L40-1001-86	SMALL FIXED INDUCTOR (10UH)		R3,4			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L516			L41-1278-14	SMALL FIXED INDUCTOR (12NH)		R5			RK73HB1J472J	CHIP R 4.7K J 1/16W	
L517			L40-1285-71	SMALL FIXED INDUCTOR (120NH)		R6			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L518,519			L40-2285-92	SMALL FIXED INDUCTOR (220NH)		R8			RK73HB1J103J	CHIP R 10K J 1/16W	
L520			L41-1878-14	SMALL FIXED INDUCTOR (18NH)		R9			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L521			L40-2285-92	SMALL FIXED INDUCTOR (220NH)		R10-12			RK73HB1J103J	CHIP R 10K J 1/16W	
L522			L41-3378-08	SMALL FIXED INDUCTOR (33NH)		R13,14			RK73HB1J823J	CHIP R 82K J 1/16W	
L523			L41-2278-14	SMALL FIXED INDUCTOR (22NH)		R15-17			RK73HB1J222J	CHIP R 2.2K J 1/16W	
L524,525			L40-1001-86	SMALL FIXED INDUCTOR (10UH)		R18			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L526			L40-2285-92	SMALL FIXED INDUCTOR (220NH)		R19			RK73HB1J332J	CHIP R 3.3K J 1/16W	
L527			L40-8275-71	SMALL FIXED INDUCTOR (82NH)		R20			RK73HB1J000J	CHIP R 0.0 J 1/16W	
L641-643			L33-1543-05	SMALL FIXED INDUCTOR (4.7UH)		R21			RK73HB1J101J	CHIP R 100 J 1/16W	
L644			L92-0149-05	CHIP FERRITE		R22			RK73HB1J151J	CHIP R 150 J 1/16W	
L645,646			L92-0140-05	CHIP FERRITE		R23			RK73HB1J222J	CHIP R 2.2K J 1/16W	
L701-703			L92-0446-05	BEADS CORE		R24			RK73HB1J151J	CHIP R 150 J 1/16W	
L704			L92-0140-05	CHIP FERRITE		R25			RK73HB1J393J	CHIP R 39K J 1/16W	
L705,706			L92-0365-05	CHIP FERRITE		R26			RK73HB1J223J	CHIP R 22K J 1/16W	
L708			L92-0446-05	BEADS CORE		R27			RK73HB1J101J	CHIP R 100 J 1/16W	
L709-711			L92-0140-05	CHIP FERRITE		R28			RK73HB1J393J	CHIP R 39K J 1/16W	
L714			L92-0446-05	BEADS CORE		R29-31			RK73HB1J223J	CHIP R 22K J 1/16W	
L716,717			L92-0446-05	BEADS CORE		R32			RK73HB1J683J	CHIP R 68K J 1/16W	
L718			L92-0639-05	CHIP FERRITE		R33			RK73HB1J333J	CHIP R 33K J 1/16W	
L720			L92-0639-05	CHIP FERRITE		R34,35			RK73HB1J223J	CHIP R 22K J 1/16W	
X351			L77-3021-05	CRYSTAL RESONATOR (45.505MHZ)		R36			RK73HB1J683J	CHIP R 68K J 1/16W	
X431			L77-3057-05	TCXO (16.8MHZ)		R37			RK73HB1J333J	CHIP R 33K J 1/16W	
X511			L77-3057-05	TCXO (16.8MHZ)		R38-41			RK73HB1J223J	CHIP R 22K J 1/16W	
X611			L78-1426-05	RESONATOR (11.0592MHZ)		R42,43			RK73HB1J104J	CHIP R 100K J 1/16W	
X701			L77-1802-05	CRYSTAL RESONATOR (32.768KHZ)		R45			RK73HB1J104J	CHIP R 100K J 1/16W	
X702			L77-3022-05	CRYSTAL RESONATOR (11.0592MHZ)		R47-52			RK73HB1J104J	CHIP R 100K J 1/16W	
X703			L77-3031-05	CRYSTAL RESONATOR (15.9744MHZ)		R53			RK73HB1J102J	CHIP R 1.0K J 1/16W	
XF351			L71-0641-15	MCF (49.95MHZ)		R54			RK73HB1J471J	CHIP R 470 J 1/16W	
XF352			L71-0642-15	MCF (45.05MHZ)		R55			RK73HB1J104J	CHIP R 100K J 1/16W	
						R56			RK73HB1J471J	CHIP R 470 J 1/16W	
CP1			RK74HB1J102J	CHIP-COM 1.0K J 1/16W		R57			RK73HB1J101J	CHIP R 100 J 1/16W	
CP2			RK74HA1J473J	CHIP-COM 47K J 1/16W		R58			RK73HB1J181J	CHIP R 180 J 1/16W	
CP3,4			RK74HB1J102J	CHIP-COM 1.0K J 1/16W		R59			RK73HB1J580J	CHIP R 56 J 1/16W	
CP5			RK75HA1J102J	CHIP-COM 1.0K J 1/16W		R60			RK73HB1J471J	CHIP R 470 J 1/16W	
CP6			RK74HB1J103J	CHIP-COM 10K J 1/16W		R61			RK73HB1J583J	CHIP R 56K J 1/16W	
CP7			RK74HB1J102J	CHIP-COM 1.0K J 1/16W		R62			RK73HB1J584J	CHIP R 560K J 1/16W	
CP8			RK75HA1J101J	CHIP-COM 100 J 1/16W		R63			RK73HB1J104J	CHIP R 100K J 1/16W	
CP9			RK74HB1J102J	CHIP-COM 1.0K J 1/16W		R65			RK73HB1J101J	CHIP R 100 J 1/16W	
CP10			RK74HA1J473J	CHIP-COM 47K J 1/16W		R66			RK73HB1J580J	CHIP R 56 J 1/16W	
CP11-14			RK74HB1J102J	CHIP-COM 1.0K J 1/16W		R67			RK73HB1J334J	CHIP R 330K J 1/16W	

PARTS LIST

TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R68			RK73HB1J564J	CHIP R 560K J 1/16W		R230			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R69			RK73HB1J820J	CHIP R 82 J 1/16W		R231			RK73HB1J273J	CHIP R 27K J 1/16W	
R70			RK73HB1J104J	CHIP R 100K J 1/16W		R232			RK73HB1J271J	CHIP R 270 J 1/16W	
R71			RK73HB1J563J	CHIP R 56K J 1/16W		R233			RK73HB1J180J	CHIP R 18 J 1/16W	
R72			RK73HB1J823J	CHIP R 82K J 1/16W		R234			RK73HB1J474J	CHIP R 470K J 1/16W	
R73			RK73HB1J683J	CHIP R 68K J 1/16W		R235			RK73HB1J473J	CHIP R 47K J 1/16W	
R74			RK73HB1J104J	CHIP R 100K J 1/16W		R236			RK73HB1J271J	CHIP R 270 J 1/16W	
R75			RK73HB1J564J	CHIP R 560K J 1/16W		R237			RK73HB1J104J	CHIP R 100K J 1/16W	
R76			RK73HB1J184J	CHIP R 180K J 1/16W		R238			RK73HB1J683J	CHIP R 68K J 1/16W	
R77			RK73HB1J124J	CHIP R 120K J 1/16W		R242			RK73HB1J473J	CHIP R 47K J 1/16W	
R80			RK73HB1J184J	CHIP R 180K J 1/16W		R243			RK73HB1J224J	CHIP R 220K J 1/16W	
R81			RK73HB1J124J	CHIP R 120K J 1/16W		R245			RK73HB1J103J	CHIP R 10K J 1/16W	
R82,83			RK73HB1J222J	CHIP R 2.2K J 1/16W		R247			RK73GB2A470J	CHIP R 47 J 1/10W	
R84-86			RK73HB1J104J	CHIP R 100K J 1/16W		R248			RK73HB1J103J	CHIP R 10K J 1/16W	
R89-92			RK73HB1J104J	CHIP R 100K J 1/16W		R250			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R93			RK73HB1J820J	CHIP R 82 J 1/16W		R251			RK73GB2A471J	CHIP R 470 J 1/10W	
R94			RK73HB1J152J	CHIP R 1.5K J 1/16W		R252			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R95			RK73HB1J121J	CHIP R 120 J 1/16W		R253			RK73GB2A331J	CHIP R 330 J 1/10W	
R96			RK73HB1J152J	CHIP R 1.5K J 1/16W		R254			RK73GB2A821J	CHIP R 820 J 1/10W	
R97			RK73HB1J104J	CHIP R 100K J 1/16W		R255			RN73HH1J102D	CHIP R 1.0K D 1/16W	
R98			RK73HB1J681J	CHIP R 680 J 1/16W		R256,257			RK73GB2A120J	CHIP R 12 J 1/10W	
R99			RK73HB1J331J	CHIP R 330 J 1/16W		R258			RK73GB2A821J	CHIP R 820 J 1/10W	
R100			RK73HB1J561J	CHIP R 560 J 1/16W		R259-262			RK73HB1J471J	CHIP R 470 J 1/16W	
R101			RK73HB1J331J	CHIP R 330 J 1/16W		R263			RK73HB1J103J	CHIP R 10K J 1/16W	
R103			RK73HB1J104J	CHIP R 100K J 1/16W		R264			RK73FB2B470J	CHIP R 47 J 1/8W	
R104			RK73HB1J184J	CHIP R 180K J 1/16W		R265			RK73HB1J103J	CHIP R 10K J 1/16W	
R105,106			RK73HB1J104J	CHIP R 100K J 1/16W		R266			RK73HB1J391J	CHIP R 390 J 1/16W	
R108			RK73HB1J104J	CHIP R 100K J 1/16W		R268-270			RK73GB2A221J	CHIP R 220 J 1/10W	
R109			RK73HB1J184J	CHIP R 180K J 1/16W		R276			RK73HB1J391J	CHIP R 390 J 1/16W	
R110			RK73HB1J333J	CHIP R 33K J 1/16W		R351			RK73HB1J183J	CHIP R 18K J 1/16W	
R111			RK73HB1J223J	CHIP R 22K J 1/16W		R352			RK73HB1J153J	CHIP R 15K J 1/16W	
R112			RK73HB1J823J	CHIP R 82K J 1/16W		R353			RK73HB1J104J	CHIP R 100K J 1/16W	
R113			RK73HB1J683J	CHIP R 68K J 1/16W		R356,357			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R114			RK73HB1J104J	CHIP R 100K J 1/16W		R358			RK73HB1J104J	CHIP R 100K J 1/16W	
R115			RK73HB1J394J	CHIP R 390K J 1/16W		R359			RK73HB1J473J	CHIP R 47K J 1/16W	
R116			RK73HB1J823J	CHIP R 82K J 1/16W		R360			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R117			RK73HB1J154J	CHIP R 150K J 1/16W		R361,362			RK73HB1J104J	CHIP R 100K J 1/16W	
R118			RK73HB1J124J	CHIP R 120K J 1/16W		R363			RK73HB1J221J	CHIP R 220 J 1/16W	
R119			RK73HB1J154J	CHIP R 150K J 1/16W		R364			RK73HB1J330J	CHIP R 33 J 1/16W	
R120-127			RK73HB1J100J	CHIP R 10 J 1/16W		R365			RK73HB1J103J	CHIP R 10K J 1/16W	
R128			RK73HB1J487J	CHIP R 4.7 J 1/16W		R366			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R129,130			RK73HB1J100J	CHIP R 10 J 1/16W		R367			RK73HB1J103J	CHIP R 10K J 1/16W	
R133-135			RK73HB1J000J	CHIP R 0.0 J 1/16W		R368			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R201			RK73HB1J223J	CHIP R 22K J 1/16W		R369			RK73HB1J561J	CHIP R 560 J 1/16W	
R202			RK73HB1J103J	CHIP R 10K J 1/16W		R370			RK73HB1J101J	CHIP R 100 J 1/16W	
R203			RK73HB1J000J	CHIP R 0.0 J 1/16W		R371			RK73HB1J334J	CHIP R 330K J 1/16W	
R204			RK73HB1J101J	CHIP R 100 J 1/16W		R372			RK73HB1J103J	CHIP R 10K J 1/16W	
R205			RK73HB1J102J	CHIP R 1.0K J 1/16W		R373			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R207			RK73HB1J222J	CHIP R 2.2K J 1/16W		R374			RK73HB1J101J	CHIP R 100 J 1/16W	
R211,212			RK73HB1J222J	CHIP R 2.2K J 1/16W		R375			RK73HB1J334J	CHIP R 330K J 1/16W	
R215			RK73HB1J222J	CHIP R 2.2K J 1/16W		R376			RK73HB1J561J	CHIP R 560 J 1/16W	
R216,217			R92-3512-05	CHIP R 0.1 F 1/2W		R377			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R218			RK73HB1J102J	CHIP R 1.0K J 1/16W		R378			RK73HB1J103J	CHIP R 10K J 1/16W	
R219			RK73HB1J151J	CHIP R 150 J 1/16W		R380			RK73HB1J334J	CHIP R 330K J 1/16W	
R220			RK73HB1J101J	CHIP R 100 J 1/16W		R381			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R221			RK73HB1J104J	CHIP R 100K J 1/16W		R382			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R222			RK73HB1J472J	CHIP R 4.7K J 1/16W		R383			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R224			RK73HB1J101J	CHIP R 100 J 1/16W		R384			RK73HB1J474J	CHIP R 470K J 1/16W	
R227			RK73HB1J000J	CHIP R 0.0 J 1/16W		R385,386			RK73HB1J334J	CHIP R 330K J 1/16W	
R229			RK73HB1J473J	CHIP R 47K J 1/16W		R387			RK73HB1J472J	CHIP R 4.7K J 1/16W	

PARTS LIST

TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R388			RK73HB1J101J	CHIP R 100 J 1/16W		R519			RK73HB1J101J	CHIP R 100 J 1/16W	
R389			RK73HB1J152J	CHIP R 1.5K J 1/16W		R523			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R390			RK73HB1J272J	CHIP R 2.7K J 1/16W		R524			RK73HB1J220J	CHIP R 22 J 1/16W	
R391			RK73HB1J334J	CHIP R 330K J 1/16W		R527			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R392			RK73HB1J272J	CHIP R 2.7K J 1/16W		R528,529			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R393			RK73HB1J104J	CHIP R 100K J 1/16W		R532			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R394			RK73HB1J562J	CHIP R 5.6K J 1/16W		R534			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R395			RK73HB1J000J	CHIP R 0.0 J 1/16W		R536			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R396			RK73HB1J224J	CHIP R 220K J 1/16W		R537			RK73HB1J104J	CHIP R 100K J 1/16W	
R397			RK73HB1J000J	CHIP R 0.0 J 1/16W		R538,539			RK73HB1J474J	CHIP R 470K J 1/16W	
R398			RK73HB1J220J	CHIP R 22 J 1/16W		R540			RK73HB1J224J	CHIP R 220K J 1/16W	
R399			RK73HB1J101J	CHIP R 100 J 1/16W		R541-543			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R401			RK73HB1J220J	CHIP R 22 J 1/16W		R544			RK73HB1J560J	CHIP R 56 J 1/16W	
R402			RK73HB1J274J	CHIP R 240K J 1/16W		R545			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R403			RK73HB1J101J	CHIP R 100 J 1/16W		R547			RK73HB1J821J	CHIP R 820 J 1/16W	
R405			RK73HB1J000J	CHIP R 0.0 J 1/16W		R548			RK73HB1J681J	CHIP R 680 J 1/16W	
R406			RK73HB1J274J	CHIP R 270K J 1/16W		R550			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R409,410			RK73HB1J471J	CHIP R 470 J 1/16W		R551			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R411			RK73HB1J181J	CHIP R 180 J 1/16W		R552			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R412			RK73HB1J000J	CHIP R 0.0 J 1/16W		R553			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R413			RK73HB1J181J	CHIP R 180 J 1/16W		R554			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R414			RK73HB1J000J	CHIP R 0.0 J 1/16W		R555			RK73HB1J681J	CHIP R 680 J 1/16W	
R415			RK73HB1J224J	CHIP R 220K J 1/16W		R556			RN73HH1J392D	CHIP R 3.9K D 1/16W	
R416			RK73HB1J824J	CHIP R 820K J 1/16W		R557			RN73HH1J682D	CHIP R 6.8K D 1/16W	
R417			RK73HB1J104J	CHIP R 100K J 1/16W		R558			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R418			RK73HB1J824J	CHIP R 820K J 1/16W		R559			RK73HB1J103J	CHIP R 10K J 1/16W	
R419			RK73HB1J124J	CHIP R 120K J 1/16W		R560			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R431			RK73HB1J220J	CHIP R 22 J 1/16W		R561			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R432			RK73HB1J000J	CHIP R 0.0 J 1/16W		R562,563			RK73HB1J473J	CHIP R 47K J 1/16W	
R436			RK73HB1J102J	CHIP R 1.0K J 1/16W		R564			RK73HB1J101J	CHIP R 100 J 1/16W	
R437,438			RK73HB1J000J	CHIP R 0.0 J 1/16W		R565			RK73HB1J183J	CHIP R 18K J 1/16W	
R439			RK73HB1J104J	CHIP R 100K J 1/16W		R566			RN73HH1J102D	CHIP R 1.0K D 1/16W	
R440			RK73HB1J102J	CHIP R 1.0K J 1/16W		R567			RN73HH1J222D	CHIP R 2.2K D 1/16W	
R441,442			RK73HB1J000J	CHIP R 0.0 J 1/16W		R568			RK73HB1J822J	CHIP R 8.2K J 1/16W	
R443			RK73HB1J560J	CHIP R 56 J 1/16W		R569			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R444			RK73HB1J681J	CHIP R 680 J 1/16W		R570			RN73HH1J220D	CHIP R 22 D 1/16W	
R445			RK73HB1J561J	CHIP R 560 J 1/16W		R571			RN73HH1J221D	CHIP R 220 D 1/16W	
R446,447			RK73HB1J681J	CHIP R 680 J 1/16W		R572			RN73HH1J101D	CHIP R 100 D 1/16W	
R448			RK73HB1J103J	CHIP R 10K J 1/16W		R573			RK73HB1J470J	CHIP R 47 J 1/16W	
R449			RK73HB1J332J	CHIP R 3.3K J 1/16W		R574			RK73HB1J103J	CHIP R 10K J 1/16W	
R451			RK73HB1J000J	CHIP R 0.0 J 1/16W		R575			RK73HB1J822J	CHIP R 8.2K J 1/16W	
R452			RK73HB1J101J	CHIP R 100 J 1/16W		R576			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R453			RK73HB1J153J	CHIP R 15K J 1/16W		R577			RK73HB1J220J	CHIP R 22 J 1/16W	
R454			RK73HB1J822J	CHIP R 8.2K J 1/16W		R578-581			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R455			RN73HH1J220D	CHIP R 22 D 1/16W		R610-612			RK73HB1J103J	CHIP R 10K J 1/16W	
R456			RN73HH1J271D	CHIP R 270 D 1/16W		R613			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R457,458			RK73HB1J470J	CHIP R 47 J 1/16W		R614			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R459			RK73HB1J103J	CHIP R 10K J 1/16W		R615			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R460			RK73HB1J822J	CHIP R 8.2K J 1/16W		R617			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R461			RK73HB1J101J	CHIP R 100 J 1/16W		R619			RK73HB1J000J	CHIP R 0.0 J 1/16W	K
R462			RK73HB1J000J	CHIP R 0.0 J 1/16W		R620			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R463			RK73HB1J102J	CHIP R 1.0K J 1/16W		R621			RK73HB1J104J	CHIP R 100K J 1/16W	
R464			RK73HB1J822J	CHIP R 8.2K J 1/16W		R623			RK73HB1J104J	CHIP R 100K J 1/16W	
R465			RK73HB1J103J	CHIP R 10K J 1/16W		R624-629			RK73HB1J474J	CHIP R 470K J 1/16W	
R466			RK73HB1J101J	CHIP R 100 J 1/16W		R630-633			RK73HB1J104J	CHIP R 100K J 1/16W	
R468			RK73HB1J101J	CHIP R 100 J 1/16W		R636,637			RK73GB2A180J	CHIP R 18 J 1/10W	
R469			RK73HB1J271J	CHIP R 270 J 1/16W		R638			RK73HB1J104J	CHIP R 100K J 1/16W	
R470			RK73HB1J101J	CHIP R 100 J 1/16W		R639			RK73FB2B000J	CHIP R 0.0 J 1/8W	
R473			RK73HB1J103J	CHIP R 10K J 1/16W		R640			RK73HH1J394D	CHIP R 390K D 1/16W	
R517			RK73HB1J103J	CHIP R 10K J 1/16W		R641			RK73HH1J563D	CHIP R 56K D 1/16W	

PARTS LIST

TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R642			RK73HB1J104J	CHIP R 100K J 1/16W		R731			RK73HB1J684J	CHIP R 680K J 1/16W	
R643			RK73HB1J223J	CHIP R 22K J 1/16W		R732			RK73HB1J333J	CHIP R 33K J 1/16W	
R644			RK73HB1J274D	CHIP R 270K D 1/16W		R733			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R645			RK73HB1J472J	CHIP R 4.7K J 1/16W		R734			RK73HB1J470J	CHIP R 47 J 1/16W	
R646			RK73HB1J823D	CHIP R 82K D 1/16W		R735			RK73HB1J223D	CHIP R 22K D 1/16W	
R647			RK73HB1J274D	CHIP R 270K D 1/16W		R736			RK73HB1J103D	CHIP R 10K D 1/16W	
R648			RK73HB1J823D	CHIP R 82K D 1/16W		R737			RK73HB1J682D	CHIP R 6.8K D 1/16W	
R649			RK73HB1J102J	CHIP R 1.0K J 1/16W		R738,739			RK73HB1J103J	CHIP R 10K J 1/16W	
R651			RK73PB2H3R3J	CHIP R 3.3 J 1/2W		R740			RK73HB1J473D	CHIP R 47K D 1/16W	
R652			RK73HB1J000J	CHIP R 0.0 J 1/16W		R741			RK73HB1J473J	CHIP R 47K J 1/16W	
R653			RK73HB1J102J	CHIP R 1.0K J 1/16W		R742			RK73HB1J103J	CHIP R 10K J 1/16W	
R656			RK73HB1J683J	CHIP R 68K J 1/16W		R743			RK73HB1J223J	CHIP R 22K J 1/16W	
R659			RK73HB1J000J	CHIP R 0.0 J 1/16W		R744			RK73HB1J103J	CHIP R 10K J 1/16W	
R660,661			RK73HB1J100J	CHIP R 10 J 1/16W		R745			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R662			RK73HB1J000J	CHIP R 0.0 J 1/16W		R746			RK73HB1J101J	CHIP R 100 J 1/16W	
R663			RK73HB1J474J	CHIP R 470K J 1/16W		R747			RK73HB1J473J	CHIP R 47K J 1/16W	
R664			RK73HB1J104D	CHIP R 100K D 1/16W		R748			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R665,666			R92-3512-05	CHIP R 0.1 F 1/2W		R749			RK73HB1J103J	CHIP R 10K J 1/16W	
R667			RK73HB1J474J	CHIP R 470K J 1/16W		R750			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R668			RK73HB1J224D	CHIP R 220K D 1/16W		R753-762			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R669			RK73HB1J393D	CHIP R 39K D 1/16W		R763			RK73HB1J100J	CHIP R 10 J 1/16W	
R670			RK73HB1J104J	CHIP R 100K J 1/16W		R764			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R672			RK73HB1J391J	CHIP R 390 J 1/16W		R765			RK73HB1J123J	CHIP R 12K J 1/16W	
R673,674			RK73HB1J102J	CHIP R 1.0K J 1/16W		R766			RK73HB1J183J	CHIP R 18K J 1/16W	
R675			RK73HB1J221J	CHIP R 220 J 1/16W		R767			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R676			RK73HB1J102J	CHIP R 1.0K J 1/16W		R768			RK73HB1J183J	CHIP R 18K J 1/16W	
R677			RK73HB1J474J	CHIP R 470K J 1/16W		R769			RK73HB1J580J	CHIP R 56 J 1/16W	
R678			RK73HB1J821J	CHIP R 820 J 1/16W		R770			RK73HB1J221J	CHIP R 220 J 1/16W	
R679			RK73HB1J102J	CHIP R 1.0K J 1/16W		R771			RK73GB2A221J	CHIP R 220 J 1/10W	
R680			RK73HB1J152J	CHIP R 1.5K J 1/16W		R772			RK73HB1J681J	CHIP R 680 J 1/16W	
R681			RK73HB1J102J	CHIP R 1.0K J 1/16W		R773			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R682			RK73HB1J104J	CHIP R 100K J 1/16W		R774			RK73HB1J473J	CHIP R 47K J 1/16W	
R683			RK73HB1J474J	CHIP R 470K J 1/16W		R775			RK73HB1J183J	CHIP R 18K J 1/16W	
R684			RK73HB1J105J	CHIP R 1.0M J 1/16W		R776			RK73HB1J224D	CHIP R 220K D 1/16W	
R685			RK73HB1J334J	CHIP R 330K J 1/16W		R777			RK73HB1J183J	CHIP R 18K J 1/16W	
R686			RK73HB1J474J	CHIP R 470K J 1/16W		R778			RK73HB1J473D	CHIP R 47K D 1/16W	
R687,688			RK73HB1J104J	CHIP R 100K J 1/16W		R779			RK73HB1J563J	CHIP R 56K J 1/16W	
R689			RK73HB1J683D	CHIP R 68K D 1/16W		R780			RK73HB1J473D	CHIP R 47K D 1/16W	
R702,703			RK73HB1J103J	CHIP R 10K J 1/16W		R781			RK73HB1J474J	CHIP R 470K J 1/16W	
R704			RK73HB1J101J	CHIP R 100 J 1/16W		R782			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R705			RK73HB1J471J	CHIP R 470 J 1/16W		R783			RK73HB1J183J	CHIP R 18K J 1/16W	
R706			RK73HB1J182J	CHIP R 1.8K J 1/16W		R784			RK73HB1J580J	CHIP R 56 J 1/16W	
R707			RK73HB1J103J	CHIP R 10K J 1/16W		R785			RK73HB1J221J	CHIP R 220 J 1/16W	
R708			RK73HB1J473J	CHIP R 47K J 1/16W		R786-788			RK73HB1J681J	CHIP R 680 J 1/16W	
R709,710			RK73HB1J101J	CHIP R 100 J 1/16W		R790			RK73GB2A000J	CHIP R 0.0 J 1/10W	
R711,712			RK73HB1J000J	CHIP R 0.0 J 1/16W		R791,792			RK73HB1J103J	CHIP R 10K J 1/16W	
R713			RK73HB1J183J	CHIP R 18K J 1/16W		R793,794			RK73HB1J683J	CHIP R 68K J 1/16W	
R714			RK73HB1J105J	CHIP R 1.0M J 1/16W		R795			RK73HB1J223J	CHIP R 22K J 1/16W	
R715,716			RK73HB1J104J	CHIP R 100K J 1/16W		R796			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R717			RK73HB1J103J	CHIP R 10K J 1/16W		R797			RK73HB1J393J	CHIP R 39K J 1/16W	
R718			RK73HB1J104J	CHIP R 100K J 1/16W		R798			RK73HB1J333J	CHIP R 33K J 1/16W	
R719,720			RK73HB1J000J	CHIP R 0.0 J 1/16W		R799			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R721			RK73HB1J103J	CHIP R 10K J 1/16W		R800			RK73HB1J154J	CHIP R 150K J 1/16W	
R722			RK73HB1J000J	CHIP R 0.0 J 1/16W		R801			RK73HB1J471J	CHIP R 470 J 1/16W	
R723			RK73HB1J473J	CHIP R 47K J 1/16W		R803			RK73HB1J471J	CHIP R 470 J 1/16W	
R725			RK73HB1J102J	CHIP R 1.0K J 1/16W		R804			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R726			RK73HB1J000J	CHIP R 0.0 J 1/16W		R805			RK73HB1J684J	CHIP R 680K J 1/16W	
R727			RK73HB1J474J	CHIP R 470K J 1/16W		R806			RK73HB1J393J	CHIP R 39K J 1/16W	
R728,729			RK73HB1J102J	CHIP R 1.0K J 1/16W		R807			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R730			RK73HB1J471J	CHIP R 470 J 1/16W		R808			RK73HB1J330J	CHIP R 33 J 1/16W	

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TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R809			RK73HH1J103D	CHIP R 10K D 1/16W		R889			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R810			RK73HB1J103J	CHIP R 10K J 1/16W		R890			RK73HB1J224J	CHIP R 220K J 1/16W	
R811			RK73HH1J473D	CHIP R 47K D 1/16W		R891			RK73HB1J103J	CHIP R 10K J 1/16W	
R814,815			RK73HB1J103J	CHIP R 10K J 1/16W		R892			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R816,817			RK73HB1J102J	CHIP R 1.0K J 1/16W		R893,894			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R818			RK73HB1J104J	CHIP R 100K J 1/16W		R895			RK73HH1J105D	CHIP R 1.0M D 1/16W	
R819			RK73HB1J103J	CHIP R 10K J 1/16W		R896			RK73HH1J334D	CHIP R 330K D 1/16W	
R820			RK73HB1J102J	CHIP R 1.0K J 1/16W		R897			RK73HB1J101J	CHIP R 100 J 1/16W	
R821			RK73HB1J824J	CHIP R 820K J 1/16W		R898			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R823			RK73HH1J103D	CHIP R 10K D 1/16W		R900			RK73HB1J471J	CHIP R 470 J 1/16W	
R824,825			RK73HB1J104J	CHIP R 100K J 1/16W		R901			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R826			RK73HB1J223J	CHIP R 22K J 1/16W		R902,903			RK73HB1J101J	CHIP R 100 J 1/16W	
R827			RK73HB1J183J	CHIP R 18K J 1/16W		R904			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R828			RK73HB1J223J	CHIP R 22K J 1/16W		R905-907			RK73HB1J103J	CHIP R 10K J 1/16W	
R829,830			RK73HB1J101J	CHIP R 100 J 1/16W		R908			RK73HB1J154J	CHIP R 150K J 1/16W	
R831			RK73HB1J473J	CHIP R 47K J 1/16W		R909			RK73HB1J103J	CHIP R 10K J 1/16W	
R832			RK73HB1J273J	CHIP R 27K J 1/16W		R910			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R833			RK73HB1J104J	CHIP R 100K J 1/16W		R912			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R834			RK73HB1J473J	CHIP R 47K J 1/16W		R914			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R835,836			RK73HB1J102J	CHIP R 1.0K J 1/16W		R915			RK73HB1J103J	CHIP R 10K J 1/16W	
R837			RK73HB1J682J	CHIP R 6.8K J 1/16W		R916,917			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R838			RK73HB1J104J	CHIP R 100K J 1/16W		R918,919			RK73HB1J473J	CHIP R 47K J 1/16W	
R839			RK73GB2A000J	CHIP R 0.0 J 1/10W		R920			RK73HB1J103J	CHIP R 10K J 1/16W	
R840-844			RK73HB1J102J	CHIP R 1.0K J 1/16W		R921			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R845,846			RK73HH1J473D	CHIP R 47K D 1/16W		R922			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R847			RK73HB1J000J	CHIP R 0.0 J 1/16W		R923			RK73HB1J103J	CHIP R 10K J 1/16W	
R848			RK73HB1J474J	CHIP R 470K J 1/16W		R924			RK73HH1J123D	CHIP R 12K D 1/16W	
R849			RK73HB1J332J	CHIP R 3.3K J 1/16W		R925			RK73HH1J223D	CHIP R 22K D 1/16W	
R850			RK73HB1J681J	CHIP R 680 J 1/16W		R926			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R851			RK73GB2A000J	CHIP R 0.0 J 1/10W		R927,928			RK73HB1J123J	CHIP R 12K J 1/16W	
R852			RK73HB1J103J	CHIP R 10K J 1/16W		R929			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R853			RK73HB1J474J	CHIP R 470K J 1/16W		R930			RK73GB1A101J	CHIP R 100 J 1/10W	
R854,855			RK73HB1J823J	CHIP R 82K J 1/16W		R931			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R856,857			RK73HH1J103D	CHIP R 10K D 1/16W		R932,933			RK73HB1J473J	CHIP R 47K J 1/16W	
R858,860			RK73HB1J102J	CHIP R 1.0K J 1/16W		R934			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R861			RK73HB1J473J	CHIP R 47K J 1/16W		R935			RK73HB1J473J	CHIP R 47K J 1/16W	
R862			RK73HB1J474J	CHIP R 470K J 1/16W		R936-938			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R863			RK73HB1J104J	CHIP R 100K J 1/16W		R939			RK73HB1J103J	CHIP R 10K J 1/16W	
R864			RK73HB1J474J	CHIP R 470K J 1/16W		R940,941			RK73HB1J123J	CHIP R 12K J 1/16W	
R865			RK73HB1J103J	CHIP R 10K J 1/16W		R942			RK73HB1J153J	CHIP R 15K J 1/16W	
R866			RK73HB1J000J	CHIP R 0.0 J 1/16W		R943-945			RK73HB1J103J	CHIP R 10K J 1/16W	
R869			RK73HB1J101J	CHIP R 100 J 1/16W		R946			RK73HB1J473J	CHIP R 47K J 1/16W	
R870			RK73HB1J824J	CHIP R 220K J 1/16W		R947			RK73HB1J154J	CHIP R 150K J 1/16W	
R871			RK73HB1J103J	CHIP R 10K J 1/16W		R948			RK73HB1J104J	CHIP R 100K J 1/16W	
R872			RK73HB1J823J	CHIP R 82K J 1/16W		R949			RK73HB1J103J	CHIP R 10K J 1/16W	
R873			RK73HB1J103J	CHIP R 10K J 1/16W		R950,951			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R874			RK73HB1J823J	CHIP R 82K J 1/16W		R952			RK73HB1J103J	CHIP R 10K J 1/16W	
R875			RK73HB1J103J	CHIP R 10K J 1/16W		R953			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R876			RK73HB1J104J	CHIP R 100K J 1/16W		R954,955			RK73HB1J103J	CHIP R 10K J 1/16W	
R877,878			RK73HB1J102J	CHIP R 1.0K J 1/16W		R956			RK73HB1J393J	CHIP R 39K J 1/16W	
R879			RK73HB1J104J	CHIP R 100K J 1/16W		R957			RK73HB1J473J	CHIP R 47K J 1/16W	
R880			RK73HB1J821J	CHIP R 820 J 1/16W		R958			RK73HB1J154J	CHIP R 150K J 1/16W	
R881			RK73HB1J103J	CHIP R 10K J 1/16W		R959,960			RK73HB1J563J	CHIP R 56K J 1/16W	
R882			RK73HB1J154J	CHIP R 150K J 1/16W		R961,962			RK73HB1J103J	CHIP R 10K J 1/16W	
R883			RN73HH1J563D	CHIP R 56K D 1/16W		R963			RK73HB1J393J	CHIP R 39K J 1/16W	
R884			RN73HH1J473D	CHIP R 47K D 1/16W		R964			RK73HB1J823J	CHIP R 82K J 1/16W	
R885			RN73HH1J393D	CHIP R 39K D 1/16W		R965			RK73HB1J334J	CHIP R 330K J 1/16W	
R886			RK73HB1J103J	CHIP R 10K J 1/16W		R966			RK73GB2A221J	CHIP R 220 J 1/10W	
R887			RN73HH1J104D	CHIP R 100K D 1/16W		R967			RK73HB1J000J	CHIP R 0.0 J 1/16W	
R888			RK73HB1J103J	CHIP R 10K J 1/16W		R968			RK73HB1J100J	CHIP R 10 J 1/16W	

PARTS LIST

TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R969			RK73HB1J223J	CHIP R 22K J 1/16W	K E	D646			RB051L-40	DIODE	K E K E
R970,971			RK73HB1J682J	CHIP R 6.8K J 1/16W		D647			HZU16-E(B2)	ZENER DIODE	
R972,973			RK73HB1J000J	CHIP R 0.0 J 1/16W		D648			DA221	DIODE	
R974,975			RK73HB1J102J	CHIP R 1.0K J 1/16W		D649,650			CMS05-0	DIODE	
R977			RK73HB1J473J	CHIP R 47K J 1/16W		D701			HZC6.8-E	ZENER DIODE	
R979-982			RK73HB1J103J	CHIP R 10K J 1/16W		D702			02D28.2F-Y	ZENER DIODE	
R983,984			RK73HB1J104J	CHIP R 100K J 1/16W		D703			HZC6.8-E	ZENER DIODE	
R985			RK73HB1J102J	CHIP R 1.0K J 1/16W		D704			RSB12JS2	ZENER DIODE	
R986			RK73HB1J000J	CHIP R 0.0 J 1/16W		D705			HZC6.8-E	ZENER DIODE	
R988			RK73HB1J473J	CHIP R 47K J 1/16W		D706			MA2S111-F	DIODE	
R989			RK73HB1J105J	CHIP R 1.0M J 1/16W		D707			1SS388F	DIODE	
R990			RK73HB1J102J	CHIP R 1.0K J 1/16W		D716			RB706F-40	DIODE	
R991-993			RK73HB1J153J	CHIP R 15K J 1/16W		D725,726			RB706F-40	DIODE	
R995			RK73HB1J000J	CHIP R 0.0 J 1/16W		D727			1SS388F	DIODE	
R996			RK73HB1J000J	CHIP R 0.0 J 1/16W		D729,730			MA2S111-F	DIODE	
R997			RK73HB1J473J	CHIP R 47K J 1/16W		D730,731			MA2S111-F	DIODE	
R998			RK73HB1J683J	CHIP R 68K J 1/16W		D732,733			MA2S111-F	DIODE	
R999			RK73HB1J124J	CHIP R 120K J 1/16W		D733			MA2S111-F	DIODE	
S708-719			S70-0509-05	TACT SWITCH		D734-739			1SS388F	DIODE	
S720-722			S70-0516-05	TACT SWITCH		D740			EDZ4.3B	ZENER DIODE	
S723-726			S70-0509-05	TACT SWITCH		D741			MA2S728	DIODE	
D5-7			HSC277	DIODE		IC201			LMC7101BIM5	MOS-IC	
D8-11			BBY65-02V	VARIABLE CAPACITANCE DIODE		IC202			UPC3232TB	BI-POLAR IC	
D12-15			1SV325F	VARIABLE CAPACITANCE DIODE		IC203			LMC7101BIM5	MOS-IC	
D16-23			BBY65-02V	VARIABLE CAPACITANCE DIODE		IC351			TC7W51FK(F)	MOS-IC	
D24-27			1SV325F	VARIABLE CAPACITANCE DIODE		IC352			TC7W53FK(F)	MOS-IC	
D28-31			BBY65-02V	VARIABLE CAPACITANCE DIODE		IC353,354			NJM2591V	BI-POLAR IC	
D32,33			1SV325F	VARIABLE CAPACITANCE DIODE		IC431			MB15E03SL-E1	MOS-IC	
D35,36			1SV325F	VARIABLE CAPACITANCE DIODE		IC512			TC7680SE0A	MOS-IC	
D38-41			BBY65-02V	VARIABLE CAPACITANCE DIODE		IC513			MB15E03SL-E1	MOS-IC	
D42-45			1SV325F	VARIABLE CAPACITANCE DIODE		IC514			XC6201P532DR	MOS-IC	
D201-205			HSC277	DIODE		IC611			78F0515AGKDXA	MCU	
D209			MA2S728	DIODE		IC639			XC6118C10AMR	MOS-IC	
D210			015AZ3.9F	ZENER DIODE		IC641			LM3420-B.4N	MOS-IC	
D211,212			HVC131	DIODE		IC642			NJM2904RB1-ZB	BI-POLAR IC	
D214			HVC131	DIODE		IC643			XC6201P152DR	MOS-IC	
D215-217			HVU131-E	DIODE		IC644			XC9221C09AMR	MOS-IC	
D219-222			HVC131	DIODE		IC645			XC6202P452DR	MOS-IC	
D223			1SS387	DIODE		IC646			NJM2872F33	BI-POLAR IC	
D225			02DZ15F-X,Y	ZENER DIODE		IC701			NJM2130F3-ZB	BI-POLAR IC	
D226			02DZ18F-X	ZENER DIODE		IC702			ADM3101E	MOS-IC	
D227			HVC131	DIODE		IC703			LM2682MMX	MOS-IC	
D228			1SS387	DIODE		IC705			NJM2387A	BI-POLAR IC	
D351			RB706F-40	DIODE		IC708,709			TC7W53FK(F)	MOS-IC	
D352			HSC277	DIODE		IC710			CP2102SX0567	MOS-IC	
D432,433			MA2S077G	DIODE		IC712			NJM2107F-ZB	ANALOGUE IC	
D434,435			1SV325F	VARIABLE CAPACITANCE DIODE		IC713			R3119N042AFE	MOS-IC	
D436			MA2S111-F	DIODE		IC714			TC7W51FK(F)	MOS-IC	
D437			HSC277	DIODE		IC715			TK11233CU	BI-POLAR IC	
D511			RB751V-40	DIODE		IC716			TC7W51FK(F)	MOS-IC	
D513			MA2S111-F	DIODE		IC717			R2023T	MOS-IC	
D514,515			MA2S077G	DIODE		IC718			TA4BS033AF	BI-POLAR IC	
D516-518			HSC277	DIODE		IC719			NJM2872AF47	BI-POLAR IC	
D519-522			1SV325F	VARIABLE CAPACITANCE DIODE		IC720			TC7W53FK(F)	MOS-IC	
D523,524			1SV278F	VARIABLE CAPACITANCE DIODE		IC721			AK2330	MOS-IC	
D525			HSC277	DIODE		IC722			NJM2112V-ZB	MOS-IC	
D643			015AZ5.1(Y)F	ZENER DIODE		IC724			TC7W74FK	MOS-IC	
D644			RB051L-40	DIODE		IC725			TA75S393F-F	MOS-IC	
D645			HZU3BL	ZENER DIODE		IC726			XC6109C28ANN	ANALOGUE IC	
						IC727			5F364AMDFB	MCU	

K : TH-D72A

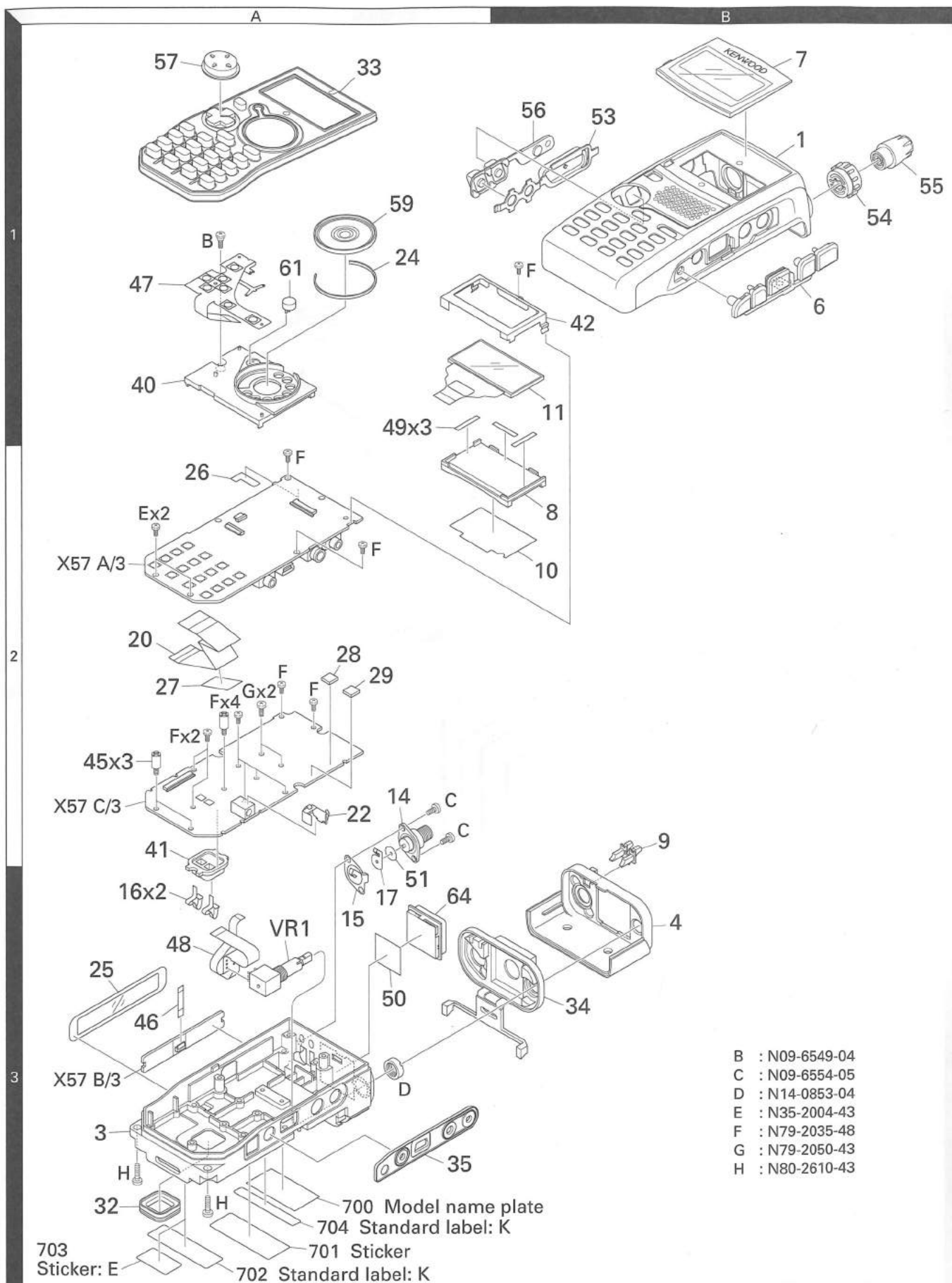
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PARTS LIST

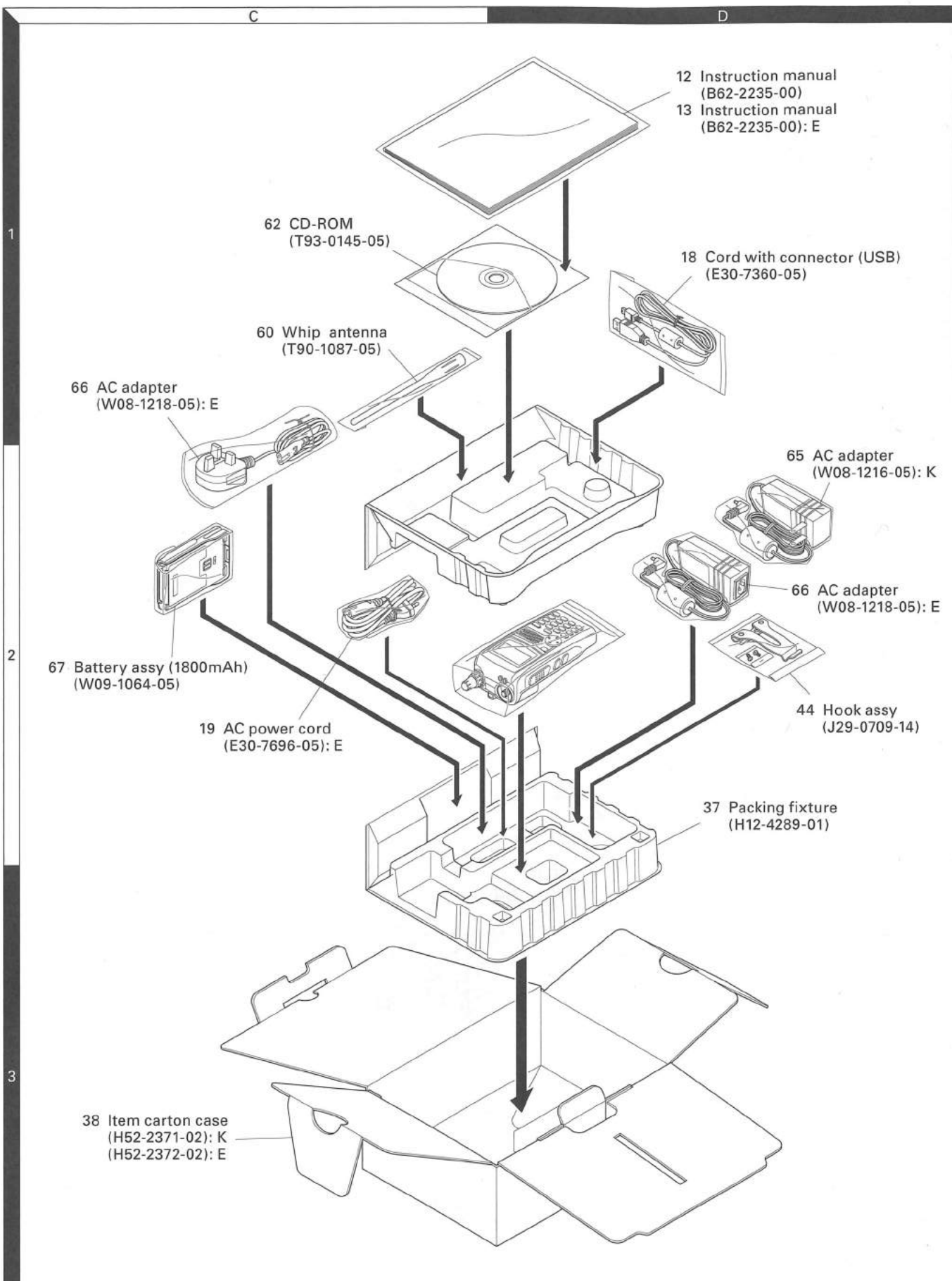
TX-RX UNIT (X57-784X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
IC728			TGT0210Q	MOS-IC		Q657			SSM6J08FU(F)	FET	
IC730			M95512-RDW6TP	ROM IC		Q658,659			UMX2N	TRANSISTOR	
IC731			M95M01-RMN6TP	ROM IC		Q660			2SJ347F	FET	
IC732			TA75W393FU-F	MOS-IC		Q661			SSM6P05FU(F)	FET	
IC733			TC75W51FK(F)	MOS-IC		Q662			SSM6L05FU-F	FET	
IC734			NJM2070M-ZB	MOS-IC		Q663			2SK1830F	FET	
IC735			TC7S66FUF	MOS-IC		Q664			RT1N441U-T111	TRANSISTOR	
IC736		*	NJM2878F4-33	BI-POLAR IC		Q701			SSM3J05FU-F	FET	
IC737			5F3651TDFC	MCU		Q702			2SK1830F	FET	
Q1			3SK318	FET		Q703			CPH3417	FET	
Q2			3SK294-FP	FET		Q704			2SJ347F	FET	
Q3			3SK318	FET		Q707			SSM6L05FU-F	FET	
Q4			3SK294-FP	FET		Q708			UPA672T-A	FET	
Q5,6			3SK318	FET		Q709			SSM6L05FU-F	FET	
Q7,8			3SK294-FP	FET		Q710			UPA672T-A	FET	
Q9-11			3SK318	FET		Q711			2SK1830F	FET	
Q12			2SK1830F	FET		Q712			2SC4738(GR)F	TRANSISTOR	
Q13			3SK318	FET		Q713			2SA1832(GR)F	TRANSISTOR	
Q14-16			2SK1830F	FET		Q714			2SK1830F	FET	
Q201			2SC5488A-H	TRANSISTOR		Q715			2SC4617(R)	TRANSISTOR	
Q204			2SC5488A-H	TRANSISTOR		Q716			2SK1830F	FET	
Q205			2SK1830F	FET		Q717,718			2SC4617(R)	TRANSISTOR	
Q207			2SC4617(R)	TRANSISTOR		Q719			SSM6L05FU-F	FET	
Q208			RN4902-F	TRANSISTOR		Q720			SSM3J05FU-F	FET	
Q209			SSM6L05FU-F	FET		Q721			12A02CH	TRANSISTOR	
Q210			SSM3J05FU-F	FET		Q722			2SC4617(R)	TRANSISTOR	
Q211			2SK1830F	FET		Q723,724			RT1N441U-T111	TRANSISTOR	
Q212			RN4902-F	TRANSISTOR		Q725			SSM3J05FU-F	FET	
Q214			NE5500234	FET		Q726			2SC4617(R)	TRANSISTOR	
Q215			2SK3476-F	FET		Q727			2SA1774(R)	TRANSISTOR	
Q352			2SC4617(R)	TRANSISTOR		Q728,729			2SC4617(R)	TRANSISTOR	
Q353			2SK1830F	FET		Q730			SSM6L05FU-F	FET	
Q354			2SC4617(R)	TRANSISTOR		TH1,2			NCP18XH103J0S	THERMISTOR	
Q355			2SK1830F	FET		TH201			NCP18XH103J0S	THERMISTOR	
Q356			2SC4617(R)	TRANSISTOR		TH355,356			ERTJ0EV104H	THERMISTOR	
Q357			2SC4649(N,P)	TRANSISTOR		TH701			ERTJ0EV104H	THERMISTOR	
Q358,359			2SC4617(S)	TRANSISTOR		TH703			NCP18WB473J0S	THERMISTOR	
Q433			2SC4617(R)	TRANSISTOR							
Q434			2SC5488A-H	TRANSISTOR							
Q435			MCH3914(7)-H	FET							
Q436-438			2SC5488A-H	TRANSISTOR							
Q512			2SC4617(R)	TRANSISTOR							
Q518			RT1N141U-T111	TRANSISTOR							
Q521			2SC5488A-H	TRANSISTOR							
Q522,523			MCH3914(7)-H	FET							
Q524			2SC5488A-H	TRANSISTOR							
Q611-614			SSM6L05FU-F	FET							
Q615,616			SSM3J05FU-F	FET							
Q642			2SK3019	FET							
Q643			2SC5706	TRANSISTOR							
Q644			SSM3J05FU-F	FET							
Q645			2SA1832(GR)F	TRANSISTOR							
Q646			RT1P436U-T111	TRANSISTOR							
Q648			2SK1830F	FET							
Q649			TPC6110-F	FET							
Q650			2SJ506-E(S)	FET							
Q651,652			SSM6L05FU-F	FET							
Q653			CPH3417	FET							
Q654			SSM6J08FU(F)	FET							
Q655,656			CPH6122	TRANSISTOR							

EXPLODED VIEW



PACKING



TROUBLE SHOOTING

Built-in GPS Operation Check Method after Repairs

When the built-in GPS is turned ON, the main MCU sets the IGPS_TXD as High level and requires the start of the GPS data transmission to the built-in GPS. The location data is sent to the main MCU via the IGPS_RXD.

The data of the built-in GPS, such as the latest satellite information that is necessary for a hot start, is stored in the battery backup memory (BBSRAM). The BBSRAM backup power source is supplied by the backup power source input terminal (GP_BU), separate from the main power source input terminal (33GP) of the built-in GPS. If there is a normal voltage external power supply input from a charged rear battery or through the DCin terminal, the BBSRAM of the built-in GPS is backed up.

Even if the rear battery is removed or the external power source is disconnected, the built-in GPS is backed up for approximately 3 minutes with the secondary internal lithium battery (when the secondary internal lithium battery is at full charge).

However, when the DC plug is connected to the DCin terminal but with the external power supply turned off and a rear battery is installed, the built-in GPS will not be backed up beyond what is available by the secondary internal lithium battery.

When the latest satellite information is backed up, the built-in GPS is able to hot start. But, when the satellite information is not updated up for approximately 2 hours, the built-in GPS is cold started.

■ Operation check method

1. Turn the transceiver power ON.
2. Switch to the GPS only mode by performing the following operations:
[Menu] > GPS [▶OK] > Int. GPS [▶OK] > Operating Mode [▶OK] > GPS Only [▶OK]
* Operate in the menu mode as follows:
Press the [▲] / [▼] keys to select an item.
Press the [▶OK] key to set the content.
Press the [ESC◀] key to return to the previous content.



Fig. 1 Menu screen 1

After pressing the [▶OK] key, the initial screen of the GPS Only mode is automatically displayed.

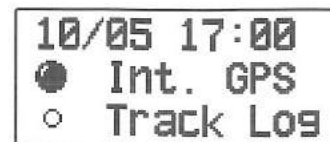


Fig. 2 GPS Only mode initial screen

3. Switch to the location data screen by operating the following keys.

- [POS]

After pressing the [POS] key, "Finding GPS satellites..." is displayed when the position has not yet been calculated. Once the position is calculated, the latitude and longitude is displayed. In this case, the built-in GPS is connected properly.



Fig. 3 Satellite search screen

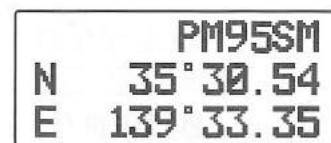


Fig. 4 Latitude/longitude display screen

If "iGPS ERROR" appears after a short while ("Finding GPS satellites..." is not displayed), a communication error between the built-in GPS and the main MCU has occurred.

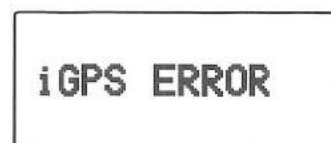


Fig. 5 Built-in GPS communication error screen

Either the built-in GPS is not connected properly, or the input/output circuit is malfunctioning.

When the position calculation is completed, and you are in a location where the GPS satellite signal can be received, the display changes from "Finding GPS satellites..." to the latitude/longitude display.

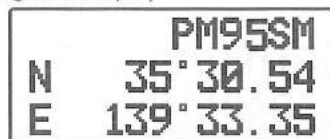
The built-in GPS is operating normally if the position calculation is completed.

TROUBLE SHOOTING

- From a cold start, it takes anywhere from 36 seconds to 5 minutes to display the latitude and longitude. From a hot start, it takes anywhere from 1 second to 30 seconds to determine the position. The time it takes to calculate the position may differ depending on the GPS reception state (reception signal strength, satellite quantity, etc.) due to the influence of various primary factors (such as satellite constellation, obstacles, weather, etc.). When the reception state is not optimal, additional time is required to calculate the position. Because the GPS satellite is a surroundings satellite, the satellite placement changes with the progress of time.

Reference: You can confirm the GPS information (GPS satellite arrangement, reception signal strength, etc.) from the location data screen during positioning, by performing the following operation:
Press the [▶OK] key four times.

Latitude longitude display



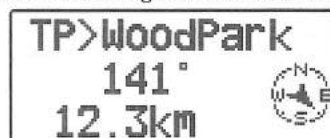
↓ [▶OK]

Time altitude traveling direction speed



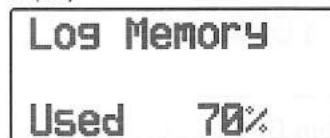
↓ [▶OK]

TP distance and traveling direction screen



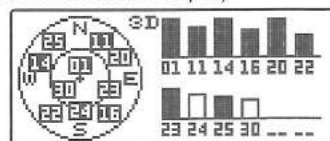
↓ [▶OK]

Log meter display



↓ [▶OK]

GPS satellite information display



- The GPS satellite signal used for the position calculation is displayed in the bar painted out. The length of the bar is the signal strength. The number under the bar is the GPS satellite number.
- From a cold start, it takes anywhere from 36 seconds to 1 minute to calculate the position when the reception environment is like the Open Sky environment, where 4 bars are at full length, in the bar display screen. When the signal strength is strong with 4 bars at about half length, and the position cannot be calculated from a cold start, you may not be in an ideal environment. In this case, relocate to an environment with better reception.
- In an Open Sky environment (where no obstacles are present in a 360 degree circumference), it takes about 36 seconds to calculate the position from a cold start (when more than 4 of the signals received from the GPS satellite are "CN0=39dB-Hz").

Fig. 6 Location data screen

ADJUSTMENT

Updating the Firmware

The firmware of the main MCU and TNC MCU can be updated using Firmware Updating Program (s). Update the firmware according to the procedure displayed in updating program. Refer to the help file of the update software for a detailed procedure.

Download the latest updating program from the following URL:

http://www.kenwood.com/j/products/info/amateur/software_download.html

* The URL may change without notice.

Note: Update the firmware after replacing the main MCU or TNC MCU.

Required Test Equipment

1. Stabilized Power Supply

- 1) The supply voltage can be changed between 3V and 16V and the current is 1A or more.
- 2) The standard voltage is 13.8V.

2. DC Ammeter (DC. A)

- 1) Class 1 ammeter (17 ranges and other features)
- 2) The full scale can be switched between 300mA and 3A.
- 3) A cable with low internal loss must be used.

3. Frequency Counter (f. counter)

- 1) Frequencies of up to 1GHz or so can be measured.
- 2) The sensitivity can be changed to 250MHz or below and measurements are highly stable and accurate (about 0.2ppm).

4. Power Meter (terminal type)

- 1) Measurable frequency: Up to 500MHz
- 2) Impedance: 50Ω, unbalanced
- 3) Measuring range: Full scale of 10W
- 4) The specified special connection cable must be used.

5. RF VTVM (RF V.M)

- 1) Measurable frequency: Up to 500MHz or so

6. Linear Detector

- 1) Measurable frequency: Up to 500MHz
- 2) Characteristic is flat and CN is 60dB or more.

7. Digital Voltmeter

- 1) Voltage range: FS = 18V or so
- 2) Input resistance: 1MΩ or more

8. Oscilloscope

- 1) Measuring range: DC to 30MHz
- 2) Provides highly accurate measurements for 5 to 25MHz

9. AF Voltmeter (AF V.M)

- 1) Measurable frequency: 50Hz to 1MHz
- 2) Maximum sensitivity: 1mV or more

10. Spectrum Analyzer

- 1) Measuring range: DC to 1GHz or more

11. Standard Signal Generator (SSG)

- 1) Maximum frequency: 500MHz or more
- 2) Output: -133dBm (0.05μV) to -13dBm (50mV)
- 3) Output impedance: 50Ω

12. Tracking Generator

- 1) Center frequency: 50kHz to 200MHz
- 2) Frequency deviation: ±35MHz
- 3) Output voltage: 100mV or more

13. Dummy Load

- 1) 8Ω, 3W or more

Single Tone Transmission

■ Function overview

- This function enables you to transmit a single tone.

■ Example

- It is used to check DTMF deviation during production.

■ Operation

1. Press [PTT] and enter transmission mode.
2. Press [MONI] to enter the single tone mode.
3. Press any of [1] to [8] numeric keys to transmit a single tone.

■ Details

- The single tone has eight frequencies.

Key	Frequency	Key	Frequency
1	697Hz	5	1209Hz
2	770Hz	6	1336Hz
3	852Hz	7	1477Hz
4	941Hz	8	1633Hz

- The single tone mode can be enabled only during transmission.
- When the unit returns from transmission mode to reception mode, the single tone mode is canceled. When transmission mode is set again and a numeric key is pressed, dual tone (DTMF) is transmitted.
- When [MONI] is pressed again in single tone mode, it returns to dual tone mode.
- A dual tone is transmitted during DTMF memory transmission even in the single tone mode.

ADJUSTMENT

Service Setup Mode

■ Function Overview

A. CONTRAST	Adjust LCD contrast.
B. Battery Volt Align	Set power supply voltage to 5.8V from Battery Terminal.
C. 2nd local	Adjust the A band 2nd local oscillator.
D. RTC	Adjust RTC frequency.
E. Transmission Frequency	Adjust transmission frequency.
F. APC	Adjust the HI, LOW, EL transmission power.
G. MAX deviation	Adjust the max deviation.
H. Balance 1	Adjust the Modulation balance 1.
I. Balance 2	Adjust the Modulation balance 2.
J. CTCSS deviation	Adjust the CTCSS deviation.
K. DCS deviation	Adjust the DCS deviation.
L. VOX gain adjustment	Adjust VOX gain.
M. BPF	Adjust the BPF tune level/
N. S-meter/Squelch	Adjust the first segment and all segment ON level of the S-meter and adjust the squelch threshold and level 2 voltage.

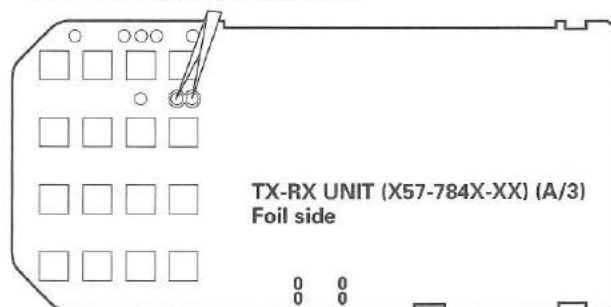
- It is not necessary for all the adjustment frequency in TH-D72A/D72E to be set by the adjustment item because it is registered inside.

■ Example

- It is used to replace the EEPROM, readjust it, or review the design in a service center.

■ Operation

- Service Setup Mode appears when accessing two illustrated lands on the component mounted side of the TX-RX Unit (A/3) while the transceiver is switched ON. When the Service Setup Mode is set, the following is displayed and adjustment item setting state is displayed on the non-operation band side.

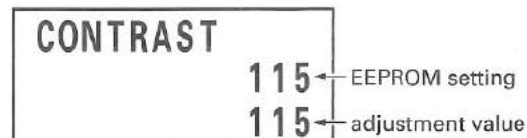


▶CONTRAST

- [▲], [▼], Encoder: Changes adjustment items. Increase or decrease the adjustment value (adjustment value).
- [▶OK]: OK and Set the adjusted adjustment value in the EEPROM.
- [ESC◀]: Escape.
- Keys other than the above can't be operated.

• A. CONTRAST

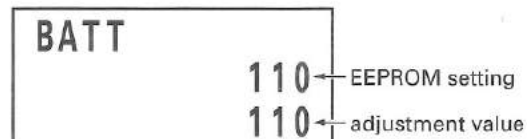
- Display the "CONTRAST" item.
- Press [▲], [▼] key and turn the encoder to the "adjustment value".
- Press [▶OK] key to set the "adjustment value" in the EEPROM.



• B. Battery Volt Align

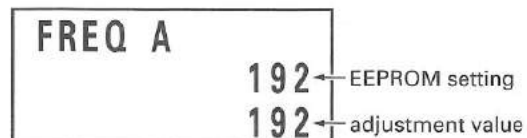
- Display the "BATT" item.
- Set power supply voltage to 5.8V from Battery Terminal.
- Press [▶OK] key to set the 5.8V reference voltage in the EEPROM.

Battery remaining voltage display are controlled based on this value.



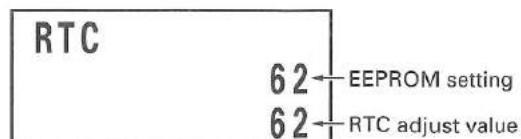
• C. 2nd local

- Display the "FREQ A" item.
- Press [▲], [▼] key and turn the encoder to the "adjustment value".
- Press [▶OK] key to set the "adjustment value" in the EEPROM.



• D. RTC

- Display the "RTC" item.
- Press [▲], [▼] key and turn the encoder to the "RTC adjust value" as shown in the "Frequency Adjustment Points" table next page.
- Press [▶OK] key to set the "adjustment value" in the EEPROM.



ADJUSTMENT

RTC table (Compensation table)		
OSC Freq. (Hz)		RTC adjust value
Lower	Upper	
32766.800	32766.899	115
32766.900	32766.999	116
32767.000	32767.099	117
32767.100	32767.199	118
32767.200	32767.299	119
32767.300	32767.399	120
32767.400	32767.499	121
32767.500	32767.599	122
32767.600	32767.699	123
32767.700	32767.799	124
32767.800	32767.899	125
32767.900	32767.999	126
32768.000	32768.099	127
32768.100	32768.199	0
32768.200	32768.299	1
32768.300	32768.399	2
32768.400	32768.499	3
32768.500	32768.599	4
32768.600	32768.699	5
32768.700	32768.799	6
32768.800	32768.899	7
32768.900	32768.999	8
32769.000	32769.099	9
32769.100	32769.199	10

• E. Transmission Frequency

- 1) Display the "FREQ B" item.
- 2) Press [▲], [▼] key and turn the encoder to the "adjustment value".
- 3) Press [►OK] key to set the "adjustment value" in the EEPROM.

FREQ B	
128	← EEPROM setting
128	← adjustment value

• F. APC

- 1) Display the "7.4V VHF" item.
- 2) Set power supply voltage to 7.4V from Battery Terminal.
- 3) Set display frequency and transmission power after press key at "7.4V VHF" item.
- 4) While press [PTT], press [▲], [▼] key and turn the encoder during transmission to increase or decrease transmission power and change the "adjustment value".
- 5) Press [►OK] key to set the "adjustment value" in the EEPROM.

- 6) Set item the display to "HI", "LO" and "EL" and adjust transmission power.
- 7) Display the "7.4V UHF" item.
- 8) Set power supply voltage to 7.4V from Battery Terminal and perform steps 3 to 6 above.
- 9) Display the "13.8 VHF" item.
- 10) Set power supply to 13.8V and perform steps 3 to 6 above.
- 11) Display the "13.8 UHF" item.
- 12) Set power supply to 13.8V and perform steps 3 to 6 above.

7.4V VHF	
HI Cent	175
	175

Power Frequency adjustment point

← EEPROM setting
← adjustment value

• G. MAX deviation

- 1) Display the "MAX DEV" item.
- 2) Select display frequency point after press [►OK] key at "MAX DEV" item.
- 3) While press [PTT], press [▲], [▼] key and turn the encoder during transmission to change the "adjustment value".
- 4) Press [►OK] key to set the "adjustment value" in the EEPROM.
- 5) Set item the display to "VHF Cent", "VHF Lo", "VHF Hi", "UHF Cent", "UHF Lo" and "UHF Hi" and adjust all frequency adjustment points.

MAX DEV	
VHF Cent	81
	81

Frequency adjustment point

← EEPROM setting
← adjustment value

• H. Balance 1

- 1) Display the "BAL1" item.
- 2) Select display frequency point after press [►OK] key at "BAL1" item.
- 3) While press [PTT], press [▲], [▼] key and turn the encoder during transmission to change the "adjustment value".
- 4) Press [►OK] key to set the "adjustment value" in the EEPROM.
- 5) Set item the display to "VHF Cent", "VHF Lo", "VHF Hi", "UHF Cent", "UHF Lo" and "UHF Hi" and adjust all frequency adjustment points.

BAL1	
VHF Cent	95
	95

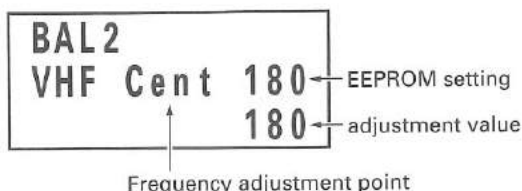
Frequency adjustment point

← EEPROM setting
← adjustment value

ADJUSTMENT

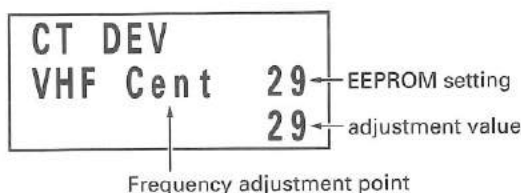
• I. Balance 2

- 1) Display the "BAL2" item.
- 2) Select display frequency point after press [►OK] key at "BAL2" item.
- 3) While press [PTT], press [▲], [▼] key and turn the encoder during transmission to change the "adjustment value".
- 4) Press [►OK] key to set the "adjustment value" in the EEPROM.
- 5) Set item the display to "VHF Cent", "VHF Lo", "VHF Hi", "UHF Cent", "UHF Lo" and "UHF Hi" and adjust all frequency adjustment points.



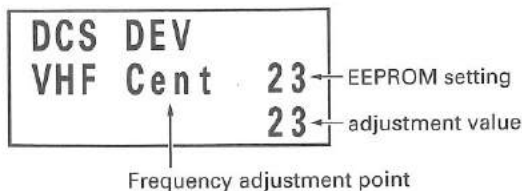
• J. CTCSS deviation

- 1) Display the "CT DEV" item.
- 2) Select display frequency point after press [►OK] key at "CT DEV" item.
- 3) While press [PTT], press [▲], [▼] key and turn the encoder during transmission to change the "adjustment value".
- 4) Press [►OK] key to set the "adjustment value" in the EEPROM.
- 5) Set item the display to "VHF Cent", "VHF Lo", "VHF Hi", "UHF Cent", "UHF Lo" and "UHF Hi" and adjust all frequency adjustment points.



• K. DCS deviation

- 1) Display the "DCS DEV" item.
- 2) Select display frequency point after press [►OK] key at "DCS DEV" item.
- 3) While press [PTT], press [▲], [▼] key and turn the encoder during transmission to change the "adjustment value".
- 4) Press [►OK] key to set the "adjustment value" in the EEPROM.
- 5) Set item the display to "VHF Cent", "VHF Lo", "VHF Hi", "UHF Cent", "UHF Lo" and "UHF Hi" and adjust all frequency adjustment points.

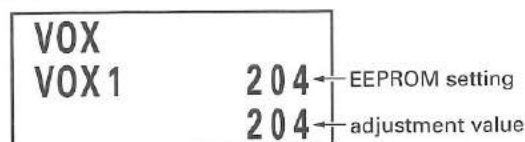


Note: CTCSS/DCS DECODE adjustment

Perform CTCSS/DCS DECODE adjustment with S-meter adjustment at "V SM/SQ A SM FULL".

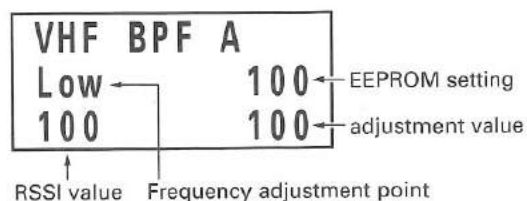
• L. VOX gain adjustment

- 1) Display the "VOX" item.
- 2) Select "VOX1" item after press [►OK] key at "VOX" item.
- 3) Enter the voltage of level 1 of the VOX gain.
- 4) Press [►OK] key to set the "adjustment value" in the EEPROM.
- 5) Select "VOX9" item after press [►OK] key at "VOX" item.
- 6) Enter the voltage of level 9 of the VOX gain.
- 7) Press [►OK] key to set the "adjustment value" in the EEPROM.



• M. BPF

- 1) Display the "VHF BPF A" item.
- 2) Select points "Low" to "High" as shown in the "Frequency Adjustment Points" table below.
- 3) Press [MONI] key because "Max RSSI Value" select automatic and set the "adjustment value" in the EEPROM.
- 4) Adjust all frequency adjustment points.



- If "MAX RSSI value" is less "70", it can't set in the EEPROM.

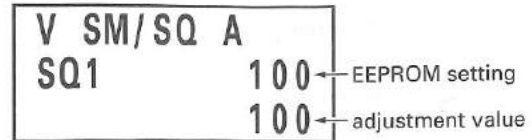
Adjustment frequency points table		
Band	Item	Frequency
VHF BPF A	Low	136.05MHz
	Center	145.95MHz
	High	173.95MHz
UHF BPF A	Low	410.05MHz
	Center	439.95MHz
	High	469.95MHz
VHF BPF B	Low	118.05MHz
	Center	145.95MHz
	High	173.95MHz
UHF BPF B	Low	320.05MHz
	LowD	380.05MHz
	Center	439.95MHz
	HighD	479.95MHz
	High	523.95MHz

ADJUSTMENT

• N. S-meter/Squelch

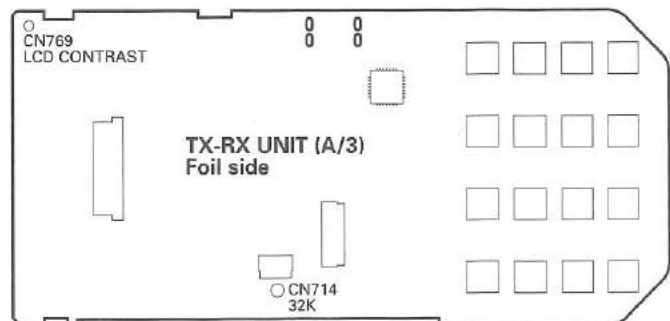
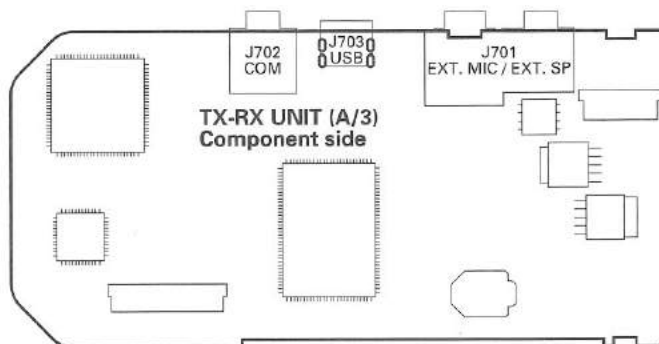
- 1) Display the "V SM/SQ A" item.
- 2) Select "SQ1" item after press [▶OK] key at "V SM/SQ A" item.
- 3) Press [▶OK] key to set the "adjustment value" in the EEPROM as a threshold value.
- 4) Select "SQ2" item.
- 5) Press [▶OK] key to set the "adjustment value" in the EEPROM as a level 2 value.
- 6) Select "SM1" item.
- 7) Press [▶OK] key to set the "adjustment value" in the EEPROM as the first segment ON value.
- 8) Select "SM FULL" item.

- 9) Press [▶OK] key to set the "adjustment value" in the EEPROM as all-segment ON value.

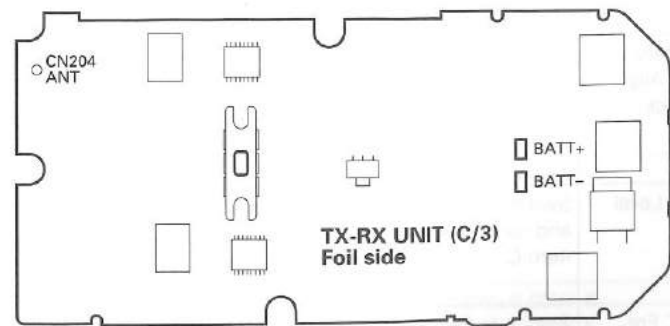
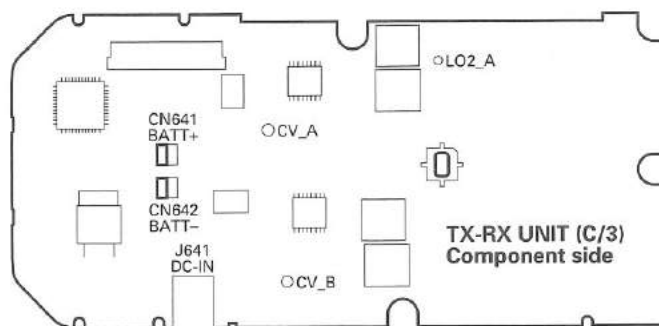


- Perform Item N about "U SM/SQ A", "V SM/SQ B" and "U SM/SQ B".
- To terminate the Service Setup mode, turn the power supply OFF.

Adjustment Points



CN714: RTC frequency adjust
CN769: LCD contrast



CV_A: VCO Lock Voltage (A-band)
CV_B: VCO Lock Voltage (B-band)
LO2_A: 2nd local

ADJUSTMENT

Common Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting and Resetting	1) External power supply connection DC-IN terminal voltage: 13.8V 2) Total illumination display confirmation Turn the power switch on while pressing the [F] key 3) Full-resetting and install value setting Release [F] key. Select the reset mode by turning the tuning control or press [▲]/[▼]. If you select "NO ", the transceiver exits the reset mode.	LCD total illumination display EL APR512 STA BCON iGPS ■■■■■■■■ VAR +R DUP AMZ ▶144.006₂₅ ◻189* ▶430.006₂₅ ▶199 Internal value setting display after all resetting  ↓ H ▶144.000 430.000 Example: Etype						
2. VCO Lock Voltage	1) Frequency: 410.0MHz	Digital voltmeter	TX-RX (C/3)	CV_A			Check	0.6V or more
	2) Frequency: 173.995MHz							4.9V or less
	• A-Band			CV_B				0.6V or more
	• B-Band							4.9V or less
	3) Frequency: 136MHz							0.6V or more
	4) Frequency: 128.995MHz							4.9V or less
	5) Frequency: 129MHz							0.6V or more
	6) Frequency: 173.995MHz							4.9V or less
	7) Frequency: 320.0MHz							0.6V or more
	8) Frequency: 455.995MHz							4.9V or less
9) Frequency: 365.0MHz	0.6V or more							
10) Frequency: 523.995MHz	4.9V or less							
3. LCD Contrast	Switch to Service Setup mode and carry out the operations for item A. 1) Ta=+25°C	Digital voltmeter	TX-RX (A/3)	CN769		Tuning control [▶]	Write	-7.0V±0.05V
4. Battery Voltage Align/ Check	Switch to Service Setup mode and carry out the operations for item B. 1) Battery terminal: 5.8V	DC power supply		Battery terminal		[▶]	Write	
5. 2nd Local	Switch to Service Setup mode and carry out the operations for item C.	f. counter Spectrum analyzer	TX-RX (C/3)	LO2_A		Tuning control [▶]	Write	50.4MHz±50Hz
6. RTC Frequency Adjust	Switch to Service Setup mode and carry out the operations for item D.	f. counter	TX-RX (A/3)	CN714		[▶]	Write	RTC table Refer to page 41.

ADJUSTMENT

Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Transmission Frequency Adjust	Switch to Service Setup mode and carry out the operations for item E. 1) Power: EL Frequency: 439.9MHz Transmission	f. counter		ANT		Tuning control [▶]	Write	439.9MHz±500Hz
2. Power Write [7.4V] Battery	Switch to Service Setup mode and carry out the operations for item F. Battery terminal: 7.4V 1) Power: HI Frequency: 146.100MHz K 145.100MHz E Transmission	Power meter Ammeter		ANT		Tuning control [▶]	Write check	4.8W±0.05W
	2) Power: HI Frequency: 144.100MHz Transmission							0.5W±0.1W
	3) Power: HI Frequency: 147.900MHz K 145.900MHz E Transmission							
	4) Power: LOW Frequency: 146.100MHz K 145.100MHz E Transmission							
	5) Power: LOW Frequency: 144.100MHz Transmission							
	6) Power: LOW Frequency: 147.900MHz K 145.900MHz E Transmission							
	7) Power: EL Frequency: 146.100MHz K 145.100MHz E Transmission							75mW±25mW
	8) Power: EL Frequency: 144.100MHz Transmission							4.8W±0.05W
	9) Power: EL Frequency: 147.900MHz K 145.900MHz E Transmission							
	10) Power: HI Frequency: 444.100MHz K 435.100MHz E Transmission							
	11) Power: HI Frequency: 438.100MHz K 430.100MHz E Transmission							4.8W±0.05W K 4.6W±0.05W E

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
2. Power Write [7.4V] Battery	12) Power: HI Frequency: 449.900MHz K 439.900MHz E Transmission	Power meter Ammeter		ANT		Tuning control [▶]	Write check	4.8W±0.05W
	13) Power: LOW Frequency: 444.100MHz K 435.100MHz E Transmission							0.5W±0.1W
	14) Power: LOW Frequency: 438.100MHz K 430.100MHz E Transmission							
	15) Power: LOW Frequency: 449.900MHz K 439.900MHz E Transmission							
	16) Power: EL Frequency: 444.100MHz K 435.100MHz E Transmission							75mW±25mW
	17) Power: EL Frequency: 438.100MHz K 430.100MHz E Transmission							
	18) Power: EL Frequency: 449.900MHz K 439.900MHz E Transmission							
3. Power Write [13.8V] DC-IN	DC-IN: 13.8V	Power meter Ammeter		ANT		Tuning control [▶]	Write check	4.8W±0.05W
	1) Power: HI Frequency: 146.100MHz K 145.100MHz E Transmission							
	2) Power: HI Frequency: 144.100MHz Transmission							
	3) Power: HI Frequency: 147.900MHz K 145.900MHz E Transmission							
	4) Power: LOW Frequency: 146.100MHz K 145.100MHz E Transmission							0.5W±0.1W
	5) Power: LOW Frequency: 144.100MHz Transmission							
	6) Power: LOW Frequency: 147.900MHz K 145.900MHz E Transmission							
	7) Power: EL Frequency: 146.100MHz K 145.100MHz E Transmission							75mW±25mW

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Power Write [13.8V] DC-IN	8) Power: EL Frequency: 144.100MHz Transmission	Power meter Ammeter		ANT		Tuning control [▶]	Write check	75mW±25mW
	9) Power: EL Frequency: 147.900MHz K 145.900MHz E Transmission							
	10) Power: HI Frequency: 444.100MHz K 435.100MHz E Transmission							4.8W±0.05W
	11) Power: HI Frequency: 438.100MHz K 430.100MHz E Transmission							
	12) Power: HI Frequency: 449.900MHz K 439.900MHz E Transmission							
	13) Power: LOW Frequency: 444.100MHz K 435.100MHz E Transmission							0.5W±0.1W
	14) Power: LOW Frequency: 438.100MHz K 430.100MHz E Transmission							
	15) Power: LOW Frequency: 449.900MHz K 439.900MHz E Transmission							
	16) Power: EL Frequency: 444.100MHz K 435.100MHz E Transmission							75mW±25mW
4. Power Check [7.4V] Battery	17) Power: EL Frequency: 438.100MHz K 430.100MHz E Transmission	Power meter Ammeter		ANT			Check	4.5W~5.1W 2.2A or less
	18) Power: EL Frequency: 449.900MHz K 439.900MHz E Transmission							
	Battery terminal: 7.4V 1) Power: HI Frequency: 146.100MHz K 145.100MHz E Transmission							
	2) Power: HI Frequency: 144.100MHz Transmission							
	3) Power: HI Frequency: 147.900MHz K 145.900MHz E Transmission							

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Power Check [7.4V] Battery	4) Power: LOW Frequency: 144.100MHz Transmission	Power meter Ammeter		ANT			Check	0.2W~0.8W 0.9A or less
	5) Power: LOW Frequency: 147.900MHz K 145.900MHz E Transmission							
	6) Power: EL Frequency: 144.100MHz Transmission							10mW or more 0.6A or less
	7) Power: EL Frequency: 147.900MHz K 145.900MHz E Transmission							
	8) Power: HI Frequency: 444.100MHz K 435.100MHz E Transmission							4.5W~5.1W 2.2A or less
	9) Power: HI Frequency: 438.100MHz K 430.100MHz E Transmission							
	10) Power: HI Frequency: 444.900MHz K 439.900MHz E Transmission							
	11) Power: LOW Frequency: 438.100MHz K 430.100MHz E Transmission							0.2W~0.8W 0.9A or less
	12) Power: LOW Frequency: 444.900MHz K 439.900MHz E Transmission							
	13) Power: EL Frequency: 438.100MHz K 430.100MHz E Transmission							10mW or more 0.6A or less
	14) Power: EL Frequency: 444.900MHz K 439.900MHz E Transmission							
5. Power Check [13.8V] DC-IN	DC-IN: 13.8V	Power meter Ammeter		ANT			Check	4.5W~5.5W 1.8A or less
	1) Power: HI Frequency: 146.100MHz K 145.100MHz E Transmission							
	2) Power: HI Frequency: 144.100MHz Transmission							
	3) Power: HI Frequency: 147.900MHz K 145.900MHz E Transmission							

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Power Check [13.8V] DC-IN	4) Power: LOW Frequency: 144.100MHz Transmission	Power meter Ammeter		ANT			Check	0.2W~0.8W 0.8A or less
	5) Power: LOW Frequency: 147.900MHz K 145.900MHz E Transmission							
	6) Power: EL Frequency: 144.100MHz Transmission							10mW or more 0.5A or less
	7) Power: EL Frequency: 147.900MHz K 145.900MHz E Transmission							
	8) Power: HI Frequency: 444.100MHz K 435.100MHz E Transmission							4.5W~5.5W 1.8A or less
	9) Power: HI Frequency: 438.100MHz K 430.100MHz E Transmission							
	10) Power: HI Frequency: 449.900MHz K 439.900MHz E Transmission							0.2W~0.8W 0.8A or less
	11) Power: LOW Frequency: 438.100MHz K 430.100MHz E Transmission							
	12) Power: LOW Frequency: 449.900MHz K 439.900MHz E Transmission							10mW or more 0.5A or less
	13) Power: EL Frequency: 438.100MHz K 430.100MHz E Transmission							
	14) Power: EL Frequency: 449.900MHz K 439.900MHz E Transmission							
6. MAX Deviation	Switch to Service Setup mode and carry out the operations for item G. 1) Frequency: 146.100MHz K 145.100MHz E AG: 1kHz/80mV Linear detector (FM±) LPF: 15kHz HPF: OFF De-emphasis: OFF Transmission	Oscillo- scope Linear detector Power meter AG		ANT		Tuning control [▶]	Write	4.2kHz±100Hz
	2) Frequency: 136.100MHz Transmission							
	3) Frequency: 173.900MHz Transmission							

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. MAX Deviation	4) Frequency: 444.100MHz K 435.100MHz E Transmission	Oscilloscope Linear detector Power meter AG		ANT		Tuning control [▶]	Write	4.2kHz±100Hz
	5) Frequency: 410.100MHz Transmission							
	6) Frequency: 469.900MHz Transmission							
7. Balance 1	Switch to Service Setup mode and carry out the operations for item H. Linear detector (FM p-p/2) LPF: 15kHz HPF: OFF De-emphasis: OFF	Power meter Linear detector Oscilloscope		ANT		Tuning control [▶]	Write	2.4kHz±50Hz
	1) Frequency: 146.100MHz K 145.100MHz E Transmission							
	2) Frequency: 136.100MHz Transmission							
	3) Frequency: 173.900MHz Transmission							
	4) Frequency: 444.100MHz K 435.100MHz E Transmission							
	5) Frequency: 410.100MHz Transmission							
	6) Frequency: 469.900MHz Transmission							
8. Balance 2	Switch to Service Setup mode and carry out the operations for item I. Linear detector (FM p-p/2) LPF: 15kHz HPF: OFF De-emphasis: OFF	Power meter Linear detector Oscilloscope		ANT		Tuning control [▶]	Write	2.4kHz±50Hz
	1) Frequency: 146.100MHz K 145.100MHz E Transmission							
	2) Frequency: 136.100MHz Transmission							
	3) Frequency: 173.900MHz Transmission							
	4) Frequency: 444.100MHz K 435.100MHz E Transmission							
	5) Frequency: 410.100MHz Transmission							
	6) Frequency: 469.900MHz Transmission							

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
9. CTCSS Deviation	Switch to Service Setup mode and carry out the operations for item J. Linear detector (FM p-p/2) LPF: 3kHz HPF: OFF De-emphasis: OFF 1) Frequency: 146.100MHz K 145.100MHz E Transmission	Power meter Linear detector Oscilloscope		ANT		Tuning control [▶]	Write	0.75kHz±50Hz
	2) Frequency: 136.100MHz Transmission							
	3) Frequency: 173.900MHz Transmission							
9. CTCSS Deviation	4) Frequency: 444.100MHz K 435.100MHz E Transmission	Power meter Linear detector Oscilloscope		ANT		Tuning control [▶]	Write	0.75kHz±50Hz
	5) Frequency: 410.100MHz Transmission							
	6) Frequency: 469.900MHz Transmission							
10. DCS Deviation	Switch to Service Setup mode and carry out the operations for item K. Linear detector (FM p-p/2) LPF: 3kHz HPF: OFF De-emphasis: OFF 1) Frequency: 146.100MHz K 145.100MHz E Transmission	Power meter Linear detector Oscilloscope		ANT		Tuning control [▶]	Write	0.75kHz±50Hz
	2) Frequency: 136.100MHz Transmission							
	3) Frequency: 173.900MHz Transmission							
	4) Frequency: 444.100MHz K 435.100MHz E Transmission							
	5) Frequency: 410.100MHz Transmission							
	6) Frequency: 469.900MHz Transmission							
11. VOX Sensitivity Write	Switch to Service Setup mode and carry out the operations for item L. 1) Frequency: 144.100MHz VOX1 AG: 1kHz/80mV	AG		MIC		[▶]	Write	
	2) Frequency: 144.100MHz VOX9 AG: 1kHz/2mV						Write	

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
12. DTMF Deviation Check [7.4V]	1) Frequency: 146.100MHz K 145.100MHz E Linear detector (FM p-p/2) LPF: 15kHz HPF: OFF De-emphasis: OFF Transmission	AG AF V.M Power meter Ammeter Linear detector Oscilloscope		ANT MIC			Check	2.0kHz~4.2kHz
13. Protection Check [7.4V]	1) Frequency: 146.100MHz K 145.100MHz E 444.100MHz K 435.100MHz E ANT: Open Transmission							2.38A or less
14. MIC Sensitivity	1) Frequency: 146.100MHz K 145.100MHz E 444.100MHz K 435.100MHz E Linear detector (FM p-p/2) LPF: 15kHz HPF: OFF De-emphasis: OFF AG: 1kHz/8mV Transmission	Linear detector Power meter Oscilloscope AG		ANT			Check	2.2kHz~3.6kHz

Receiver Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. RX BPF Tune Write • A-Band	Switch to Service Setup mode and carry out the operations for item M. 1) Frequency: 136.05MHz SSG: (-100dBm) 2.2μV Mode: FM (3kHz) AF VR: 0.63V/8Ω 2) Frequency: 145.95MHz SSG: (-100dBm) 2.2μV 3) Frequency: 173.95MHz SSG: (-100dBm) 2.2μV 4) Frequency: 410.05MHz SSG: (-100dBm) 2.2μV 5) Frequency: 439.95MHz SSG: (-100dBm) 2.2μV 6) Frequency: 469.95MHz SSG: (-100dBm) 2.2μV	SSG Oscilloscope Distortion meter AF V.M		ANT SP		[MONI]	Press [MONI] key for writing.	Max RSSI value

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. RX BPF Tune Write • B-Band	7) Frequency: 118.05MHz SSG: (-100dBm) 2.2 μ V	SSG Oscillo- scope Distortion meter AF V.M		ANT SP		[MONI]	Press [MONI] key for writing.	Max RSSI value
	8) Frequency: 145.95MHz SSG: (-100dBm) 2.2 μ V							
	9) Frequency: 173.95MHz SSG: (-100dBm) 2.2 μ V							
	10) Frequency: 320.05MHz SSG: (-90dBm) 7.1 μ V							
	11) Frequency: 380.05MHz SSG: (-95dBm) 4.0 μ V							
	12) Frequency: 439.95MHz SSG: (-100dBm) 2.2 μ V							
	13) Frequency: 479.95MHz SSG: (-100dBm) 2.2 μ V							
	14) Frequency: 523.95MHz SSG: (-100dBm) 2.2 μ V							
2. Squelch Write • A-Band	Switch to Service Setup mode and carry out the operations for item N. 1) Frequency: 145.95MHz SQL1 SSG: (-125dBm) 0.126 μ V SQL2 SSG: (-120dBm) 0.22 μ V	SSG		ANT		[▶]	Write	
	2) Frequency: 439.95MHz SQL1 SSG: (-125dBm) 0.126 μ V SQL2 SSG: (-120dBm) 0.22 μ V							
2. Squelch Write • B-Band	3) Frequency: 145.95MHz SQL1 SSG: (-125dBm) 0.126 μ V SQL2 SSG: (-120dBm) 0.22 μ V	SSG		ANT		[▶]	Write	
	4) Frequency: 439.95MHz SQL1 SSG: (-125dBm) 0.126 μ V SQL2 SSG: (-120dBm) 0.22 μ V							
3. Squelch Check • A-Band	1) Frequency: 146.050MHz K 145.050MHz E Mode: FM SSG: (-122dBm) 0.178 μ V	SSG Oscillo- scope		ANT			Check	Open squelch
	2) SSG: OFF							Close squelch
	3) Frequency: 444.05MHz K 435.05MHz E Mode: FM SSG: (-122dBm) 0.178 μ V							Open squelch
	4) SSG: OFF							Close squelch

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Squelch Check • B-Band	5) Frequency: 146.050MHz K 145.050MHz E Mode: FM SSG: (-119dBm) 0.25μV	SSG Oscilloscope		ANT			Check	Open squelch
	6) SSG: OFF							Close squelch
	7) Frequency: 444.05MHz K 435.05MHz E Mode: FM SSG: (-119dBm) 0.25μV							Open squelch
	8) SSG: OFF							Close squelch
4. S-meter Write • A-Band	Switch to Service Setup mode and carry out the operations for item N. 1) Frequency: 145.95MHz S1 SSG: (-120dBm) 0.22μV FULL SSG: (-105dBm) 1.3μV	SSG		ANT		[▶]	Write	Adjust CTCSS/DCS DECODE
	2) Frequency: 439.95MHz S1 SSG: (-120dBm) 0.22μV FULL SSG: (-105dBm) 1.3μV							
	• B-Band 3) Frequency: 145.95MHz S1 SSG: (-120dBm) 0.22μV FULL SSG: (-105dBm) 1.3μV							
	4) Frequency: 439.95MHz S1 SSG: (-120dBm) 0.22μV FULL SSG: (-105dBm) 1.3μV							
5. S-meter Check • A-Band	1) Frequency: 146.050MHz K 145.050MHz E Mode: FM SSG: (-120dBm) 0.22μV±3dB	SSG		ANT		LCD	Check	One segment in S-meter lights.
	2) SSG: (-105dBm) 1.3μV±3dB							All segments in S-meter lights.
	3) Frequency: 444.05MHz K 435.05MHz E Mode: FM SSG: (-120dBm) 0.22μV±3dB							One segment in S-meter lights.
	4) SSG: (-105dBm) 1.3μV±3dB							All segments in S-meter lights.
	• B-Band 5) Frequency: 146.050MHz K 145.050MHz E Mode: FM SSG: (-120dBm) 0.22μV±3dB							One segment in S-meter lights.
	6) SSG: (-105dBm) 1.3μV±3dB							All segments in S-meter lights.
	7) Frequency: 444.05MHz K 435.05MHz E Mode: FM SSG: (-120dBm) 0.22μV±3dB							One segment in S-meter lights.
	8) SSG: (-105dBm) 1.3μV±3dB							All segments in S-meter lights.

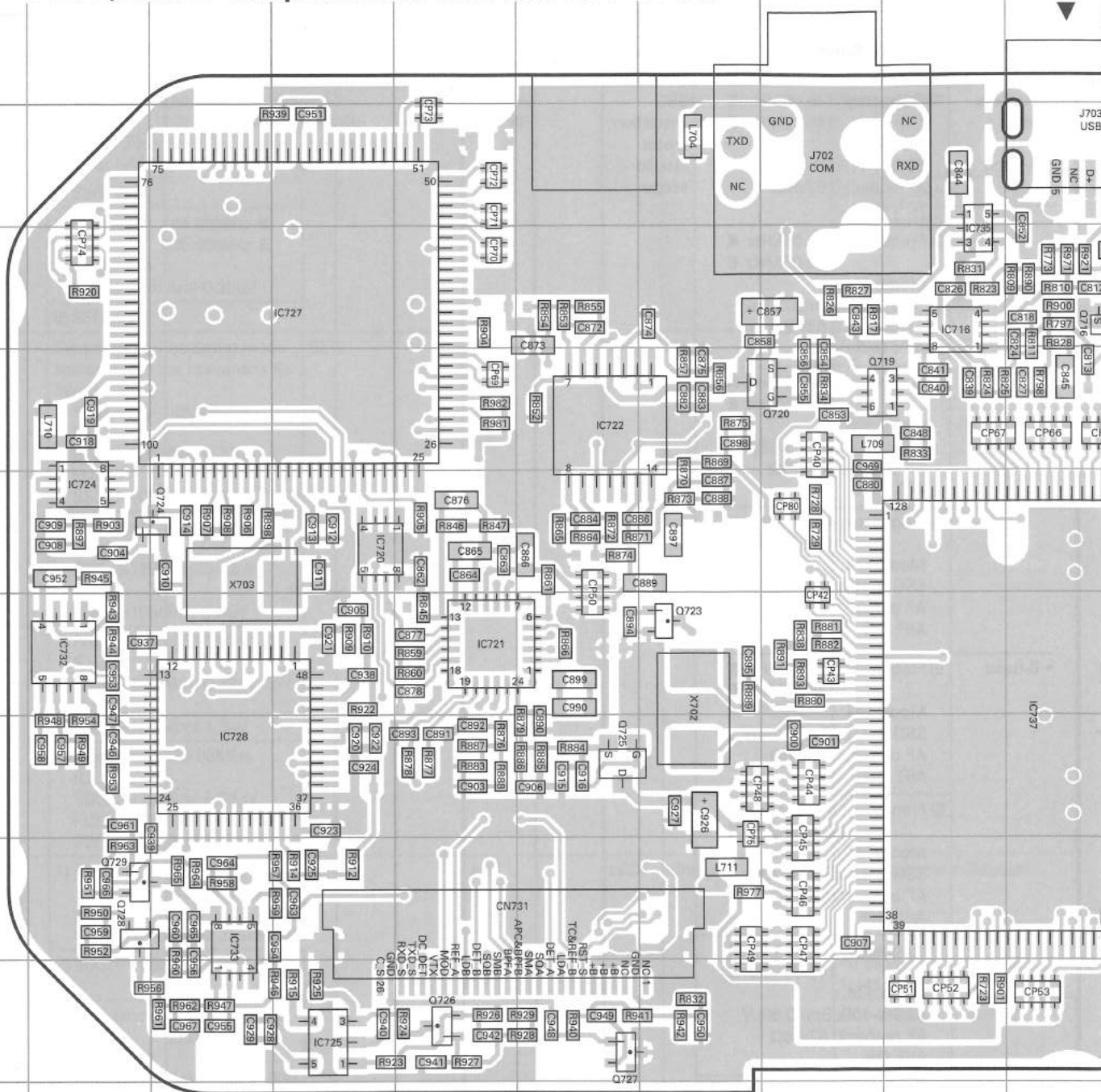
ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. Sensitivity Check • A-Band	1) Frequency: 146.05MHz K 145.05MHz E Mode: FM SSG: (-119dBm) 0.25 μ V AF output: 0.63V/8 Ω AIP: OFF	SSG Distortion meter Oscilloscope		ANT SP			Check	12dB SINAD or more
	2) Frequency: 444.05MHz K 435.05MHz E Mode: FM SSG: (-119dBm) 0.25 μ V AF output: 0.63V/8 Ω AIP: OFF							
	3) Frequency: 146.05MHz K 145.05MHz E Mode: FM SSG: (-111dBm) 0.63 μ V AF output: 0.63V/8 Ω AIP: ON							
	4) Frequency: 444.05MHz K 435.05MHz E Mode: FM SSG: (-108dBm) 0.89 μ V AF output: 0.63V/8 Ω AIP: ON							
	• B-Band							
	5) Frequency: 146.05MHz K 145.05MHz E Mode: FM SSG: (-118dBm) 0.28 μ V AF output: 0.63V/8 Ω AIP: OFF							
	6) Frequency: 444.05MHz K 435.05MHz E Mode: FM SSG: (-118dBm) 0.28 μ V AF output: 0.63V/8 Ω AIP: OFF							
	7) Frequency: 146.05MHz K 145.05MHz E Mode: FM SSG: (-108dBm) 0.89 μ V AF output: 0.63V/8 Ω AIP: ON							
7. AF Distortion Check • A-Band • B-Band	8) Frequency: 444.05MHz K 435.05MHz E Mode: FM SSG: (-105dBm) 1.26 μ V AF output: 0.63V/8 Ω AIP: ON	SSG Distortion meter Oscilloscope		ANT SP			Check	5% or less
	1) Frequency: 146.05MHz K 145.05MHz E SSG: (-53dBm) 501 μ V AF output: 0.63V/8 Ω							
	2) Frequency: 146.05MHz K 145.05MHz E SSG: (-53dBm) 501 μ V AF output: 0.63V/8 Ω							

TH-D72A/D72E PC BOARD

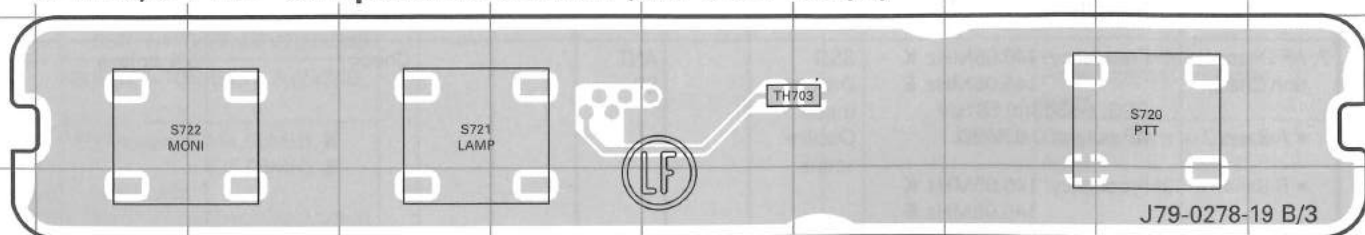
TX-RX UNIT (X57-784X-XX) (A/3): CONTROL section

0-11: K, 2-71: E Component side view (J79-0278-19 A/3)



TX-RX UNIT (X57-784X-XX) (B/3): PTT section

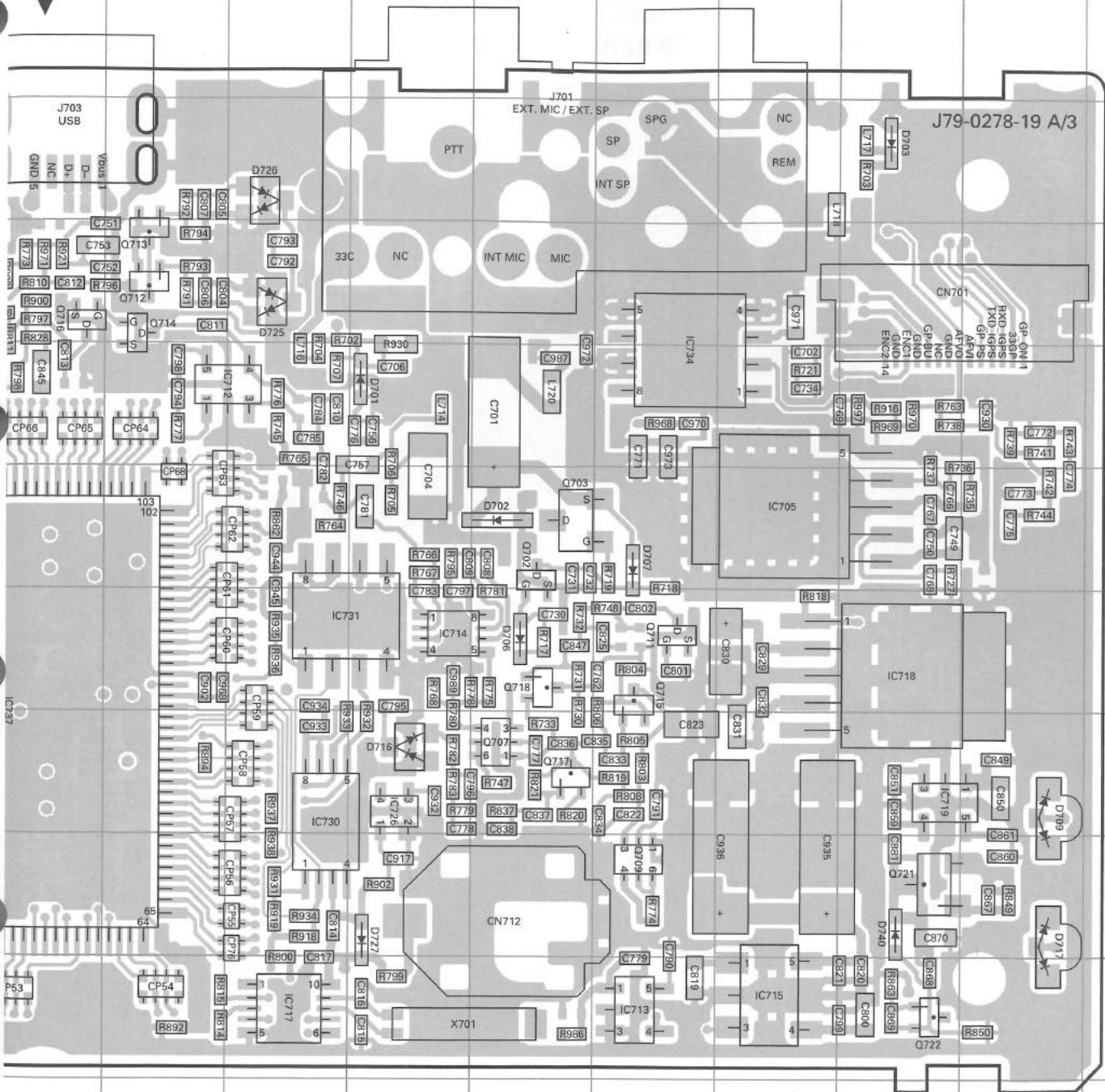
0-11: K, 2-71: E Component side view (J79-0278-19 B/3)



J79-0278-19 B/3

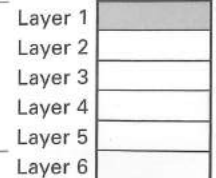
PC BOARD TH-D72A/D72E

TX-RX UNIT (X57-784X-XX) (A/3): CONTROL section
0-11: K, 2-71: E Component side view (J79-0278-19 A/3)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC705	6P	IC721	7E	IC733	9C	Q713	4K	Q723	7G	D706	7N
IC712	5L	IC722	5F	IC734	5O	Q714	4K	Q724	6C	D707	6O
IC713	10O	IC724	6B	IC735	4I	Q715	7O	Q725	8F	D709	8R
IC714	7M	IC725	10D	IC737	8J	Q716	4J	Q726	10E	D716	8M
IC715	10P	IC726	8M	Q702	6N	Q717	8N	Q727	10F	D717	9R
IC716	4I	IC727	4D	Q703	6N	Q718	7N	Q728	9B	D725	4L
IC717	10L	IC728	8C	Q707	8N	Q719	5H	Q729	9B	D726	3L
IC718	7Q	IC730	8L	Q709	9O	Q720	5H	D701	5M	D727	9M
IC719	8Q	IC731	7L	Q711	7O	Q721	9Q	D702	6N	D740	9Q
IC720	6D	IC732	7B	Q712	4K	Q722	10Q	D703	3Q		

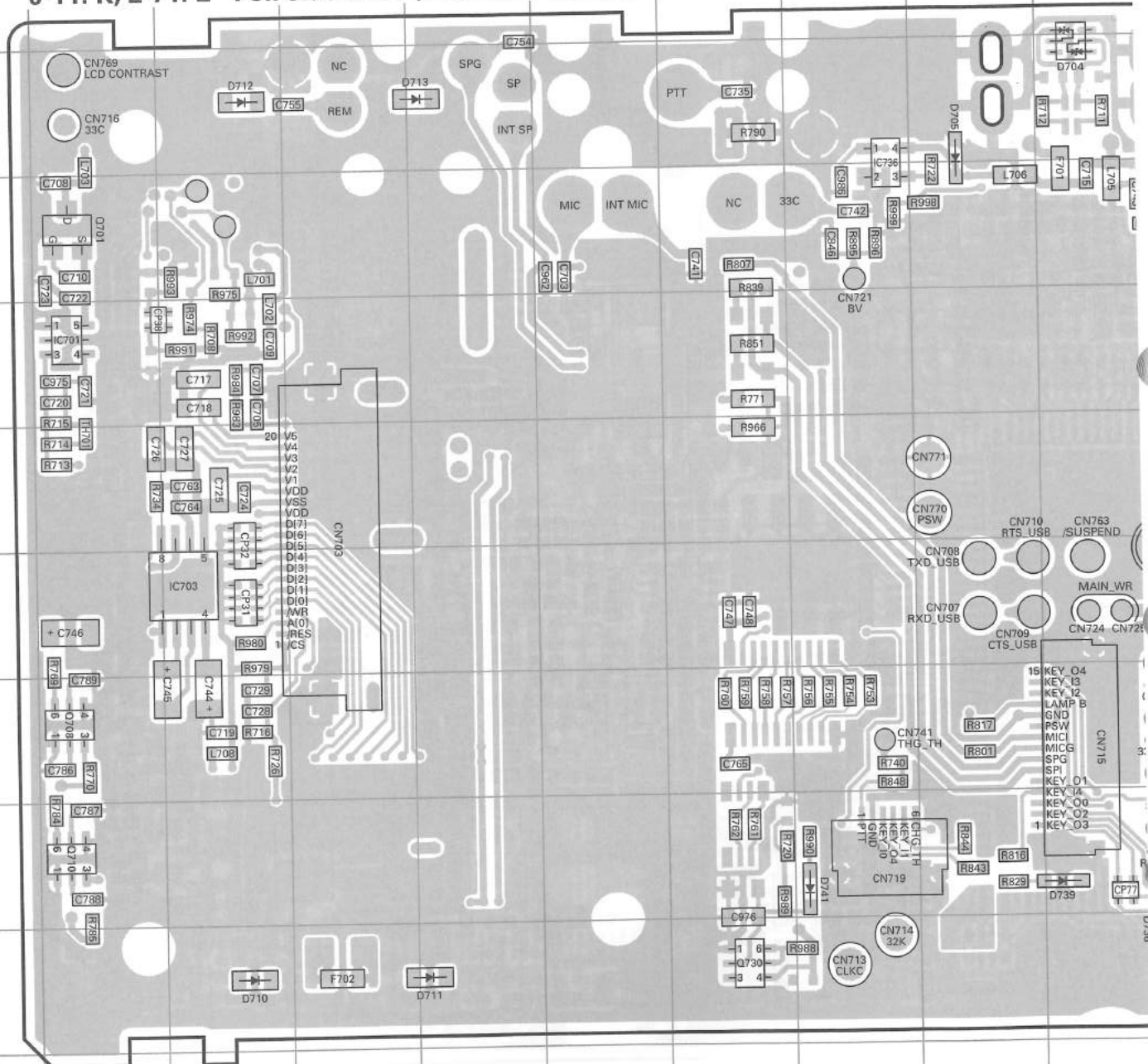
Component side



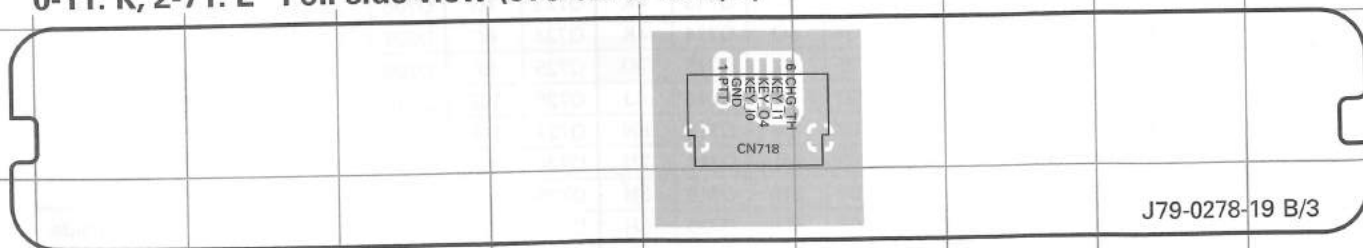
Foil side

TH-D72A/D72E PC BOARD

TX-RX UNIT (X57-784X-XX) (A/3): CONTROL section
0-11: K, 2-71: E Foil side view (J79-0278-19 A/3)



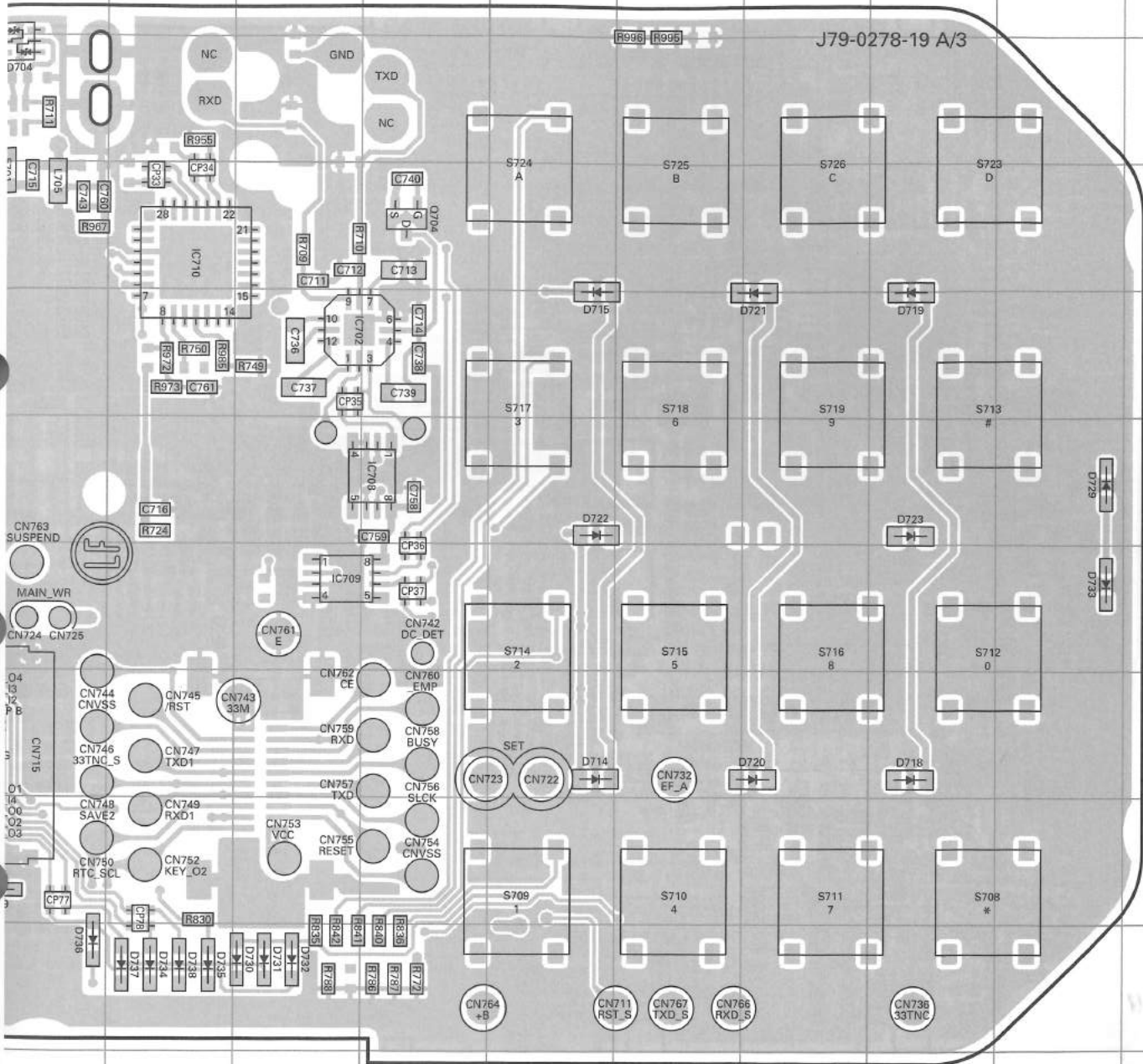
TX-RX UNIT (X57-784X-XX) (B/3): PTT section
0-11: K, 2-71: E Foil side view (J79-0278-19 B/3)



J79-0278-19 B/3

PC BOARD TH-D72A/D72E

TX-RX UNIT (X57-784X-XX) (A/3): CONTROL section
0-11: K, 2-71: E Foil side view (J79-0278-19 A/3)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC701	5B	Q710	9B	D718	8Q	D733	7R
IC702	5L	Q730	10G	D719	5Q	D734	10K
IC703	7C	D704	3J	D720	8P	D735	10K
IC708	6M	D705	3I	D721	5P	D736	10J
IC709	7L	D710	10C	D722	6N	D737	10K
IC710	4K	D711	10E	D723	6Q	D738	10K
IC736	3H	D712	3C	D729	6R	D739	9J
Q701	4B	D713	3E	D730	10L	D741	9H
Q704	4M	D714	8N	D731	10L		
Q708	8B	D715	5N	D732	10L		

Component side

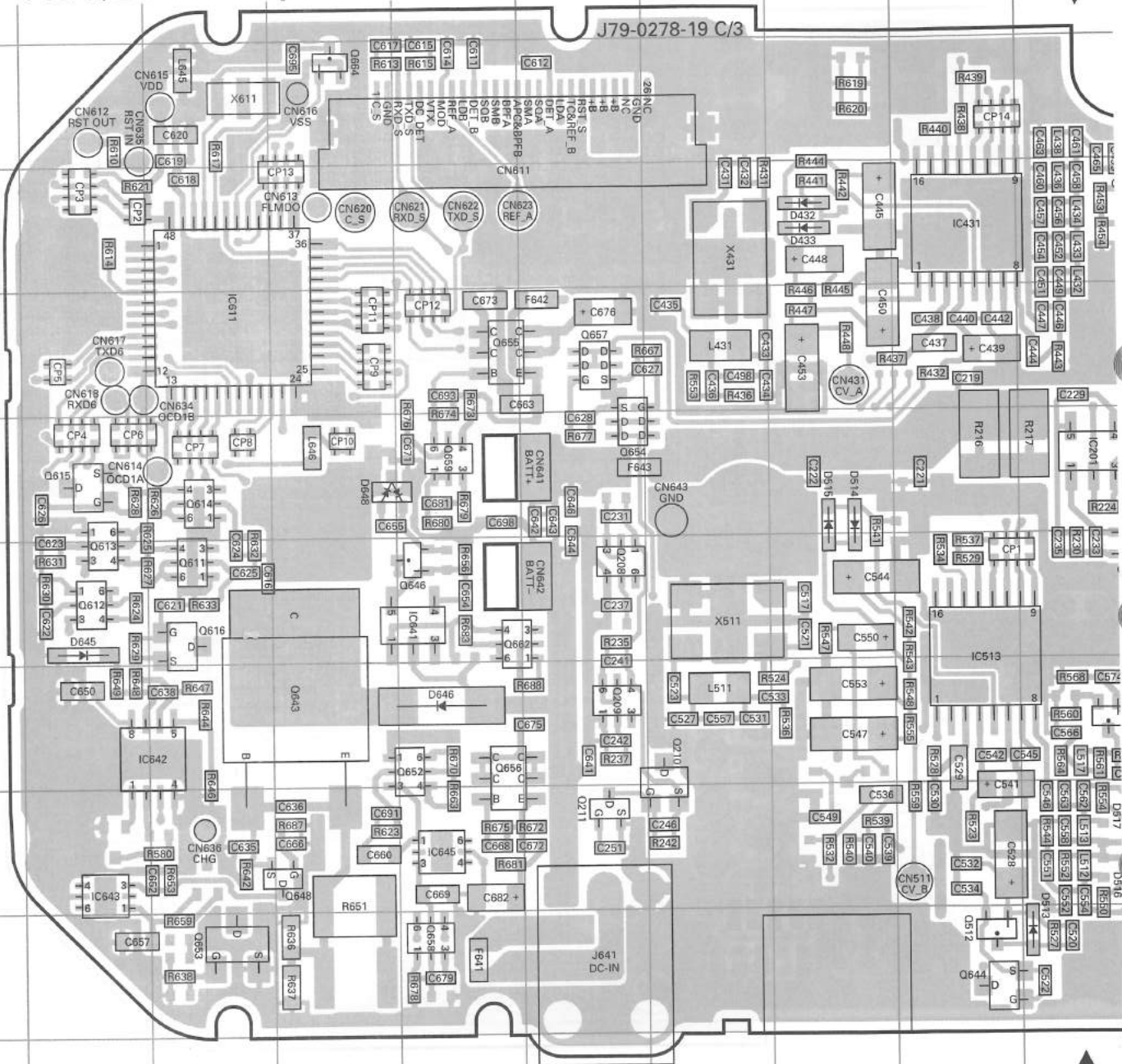
Layer 1
Layer 2
Layer 3
Layer 4
Layer 5
Layer 6

Foil side

TH-D72A/D72E PC BOARD

TX-RX UNIT (X57-784X-XX) (C/3): TX-RX section

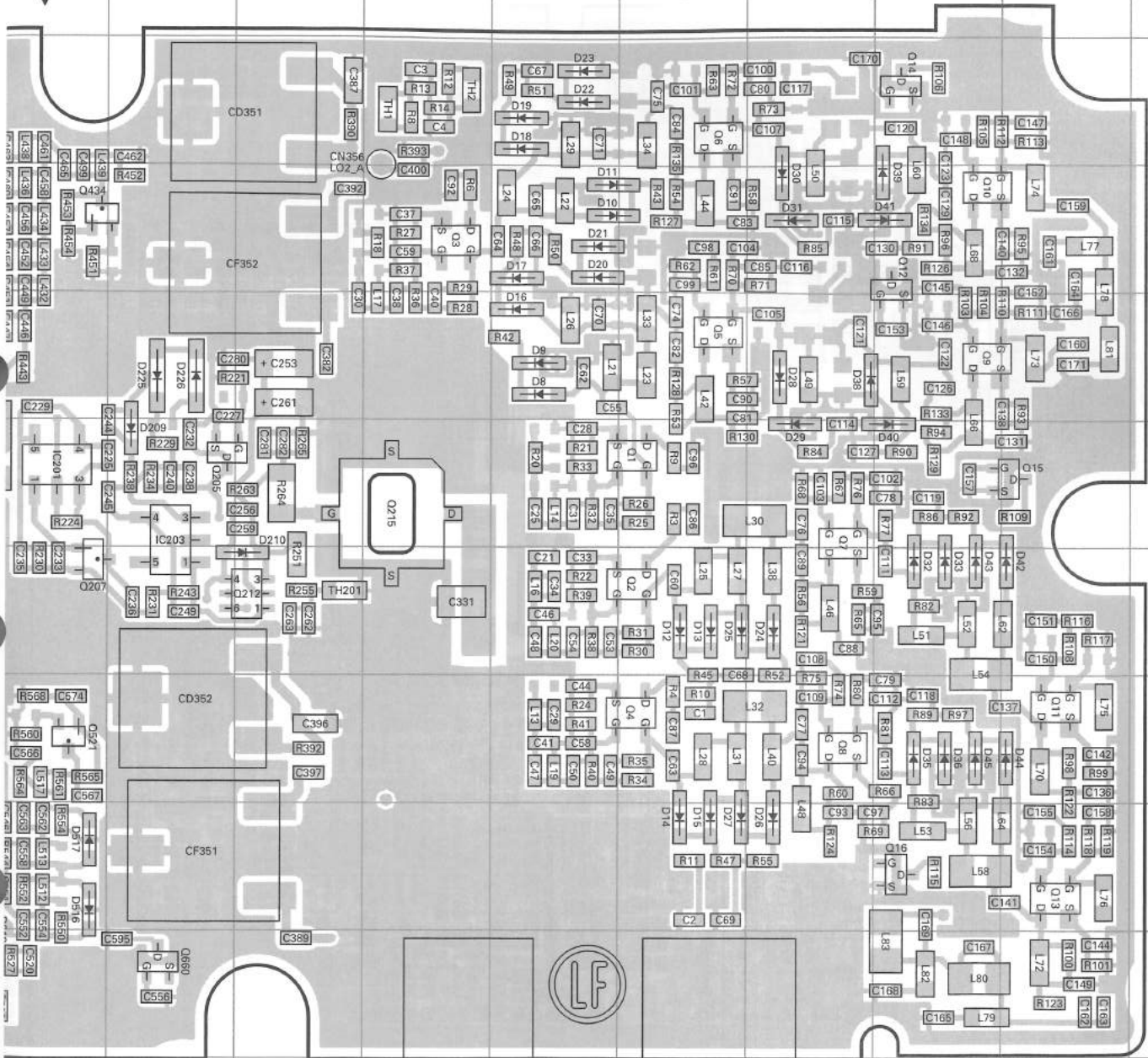
0-11: K, 2-71: E Component side view (J79-0278-19 C/3)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. N
IC201	6J	Q3	4M	Q14	3Q	Q434	4J	Q646	7E	Q662	7E	D17	4N	D28
IC203	6K	Q4	8O	Q15	6R	Q512	10I	Q648	9D	Q664	3D	D18	3N	D29
IC431	4I	Q5	5O	Q16	9Q	Q521	8J	Q652	8E	D8	5N	D19	3N	D30
IC513	7I	Q6	3O	Q205	6K	Q611	7C	Q653	10C	D9	5N	D20	4N	D31
IC611	5C	Q7	6P	Q207	7J	Q612	7B	Q654	6F	D10	4N	D21	4N	D32
IC641	7E	Q8	8P	Q208	7F	Q613	7B	Q655	5E	D11	4N	D22	3N	D33
IC642	8C	Q9	5Q	Q209	8F	Q614	6C	Q656	8E	D12	7O	D23	3N	D35
IC643	9B	Q10	4Q	Q210	8G	Q615	6B	Q657	5F	D13	7O	D24	7P	D36
IC645	9E	Q11	8R	Q211	9F	Q616	7C	Q658	10E	D14	9O	D25	7O	D38
Q1	6O	Q12	4Q	Q212	7L	Q643	8D	Q659	6E	D15	9O	D26	9P	D39
Q2	7O	Q13	9R	Q215	6M	Q644	10I	Q660	10K	D16	5N	D27	9O	D40

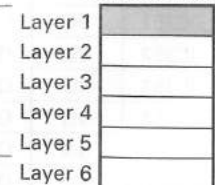
PC BOARD TH-D72A/D72E

TX-RX UNIT (X57-784X-XX) (C/3): TX-RX section
0-11: K, 2-71: E Component side view (J79-0278-19 C/3)



ss	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
	D28	5P	D41	4Q	D513	10J
	D29	6P	D42	7R	D514	6H
	D30	4P	D43	7Q	D515	6H
	D31	4P	D44	8R	D516	9J
	D32	7Q	D45	8Q	D517	9J
	D33	7Q	D209	6K	D645	7B
	D35	8Q	D210	7L	D646	8E
	D36	8Q	D225	5K	D648	6D
	D38	5P	D226	5K		
	D39	4Q	D432	4H		
	D40	6Q	D433	4H		

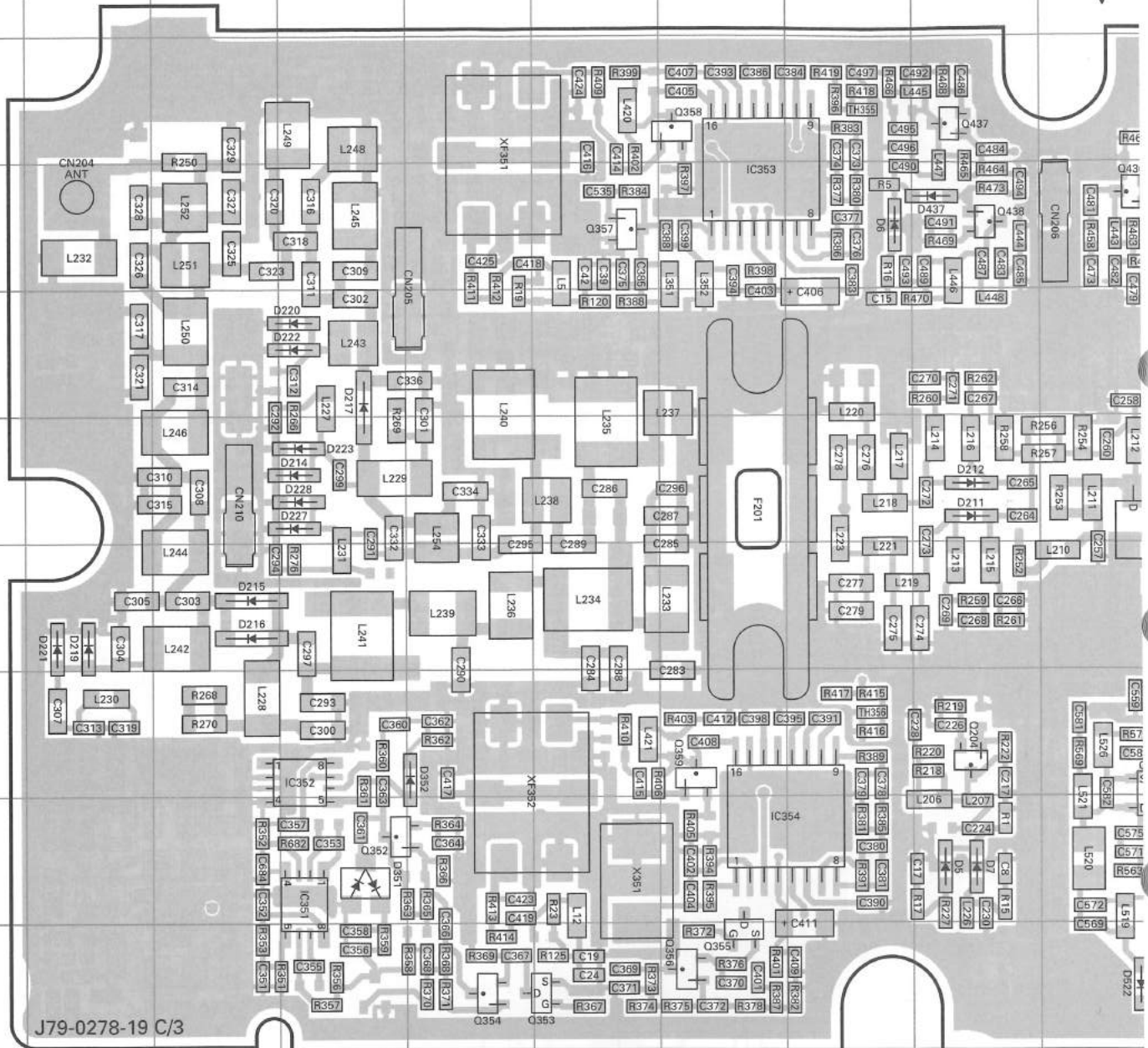
Component side



Foil side

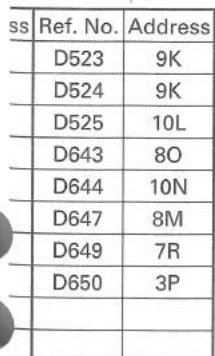
TH-D72A/D72E PC BOARD

TX-RX UNIT (X57-784X-XX) (C/3): TX-RX section
0-11: K, 2-71: E Foil side view (J79-0278-19 C/3)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. N
IC202	5K	Q201	8L	Q359	8G	Q642	9M	D201	6L	D217	5D	D434	4L	D523
IC351	9D	Q204	8I	Q433	4K	Q645	9N	D202	7L	D219	7B	D435	4L	D524
IC352	8D	Q214	6J	Q435	3K	Q649	9O	D203	7L	D220	5D	D436	4K	D525
IC353	4G	Q352	9D	Q436	4J	Q650	8Q	D204	6L	D221	7B	D437	4I	D643
IC354	9G	Q353	10F	Q437	3I	Q651	4O	D205	6K	D222	5D	D511	4N	D644
IC512	3N	Q354	10E	Q438	4I	Q661	8K	D211	6I	D223	6D	D518	10K	D647
IC514	4M	Q355	10G	Q518	8K	Q663	5P	D212	6I	D227	6D	D519	10K	D649
IC639	8N	Q356	10G	Q522	8J	D5	9I	D214	6D	D228	6D	D520	10K	D650
IC644	8P	Q357	4F	Q523	9L	D6	4H	D215	7C	D351	9D	D521	9L	
IC646	4P	Q358	3G	Q524	7K	D7	9I	D216	7C	D352	8E	D522	10J	

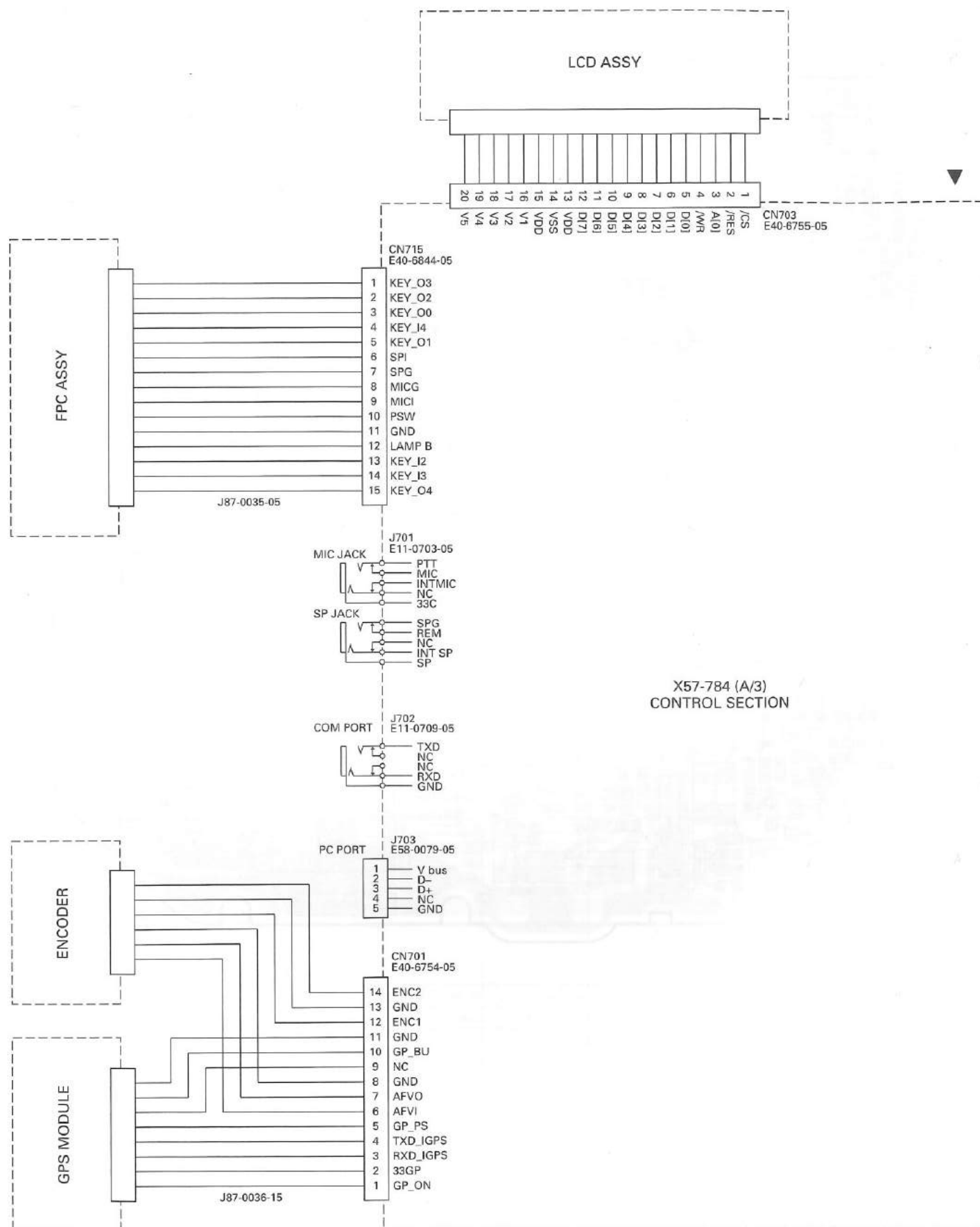
TX-RX UNIT (X57-784X-XX) (C/3): TX-RX section
0-11: K, 2-71: E Foil side view (J79-0278-19 C/3)



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TH-D72A/D72E

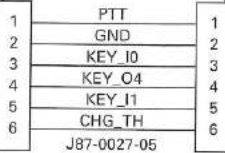
INTERCONNECTION DIAGRAM



TH-D72A/D72E

INTERCONNECTION DIAGRAM

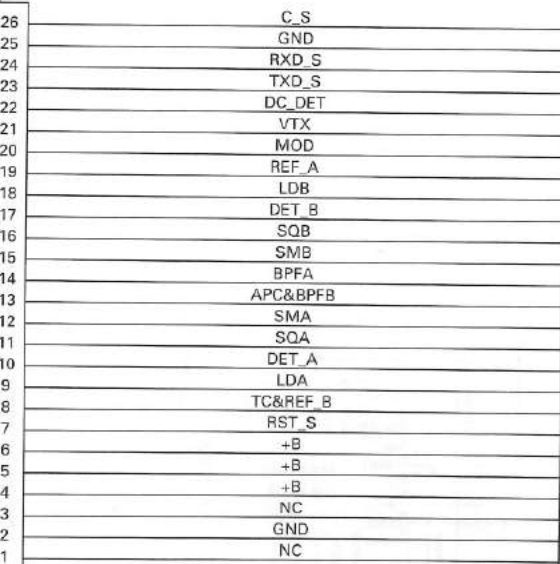
CN719
E40-6883-05



J87-0027-05

X57-784 (B/3)
PTT SECTION

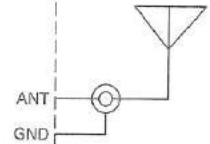
CN731
E40-6880-05



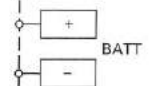
E47-1477-05

CN811
E40-6880-05

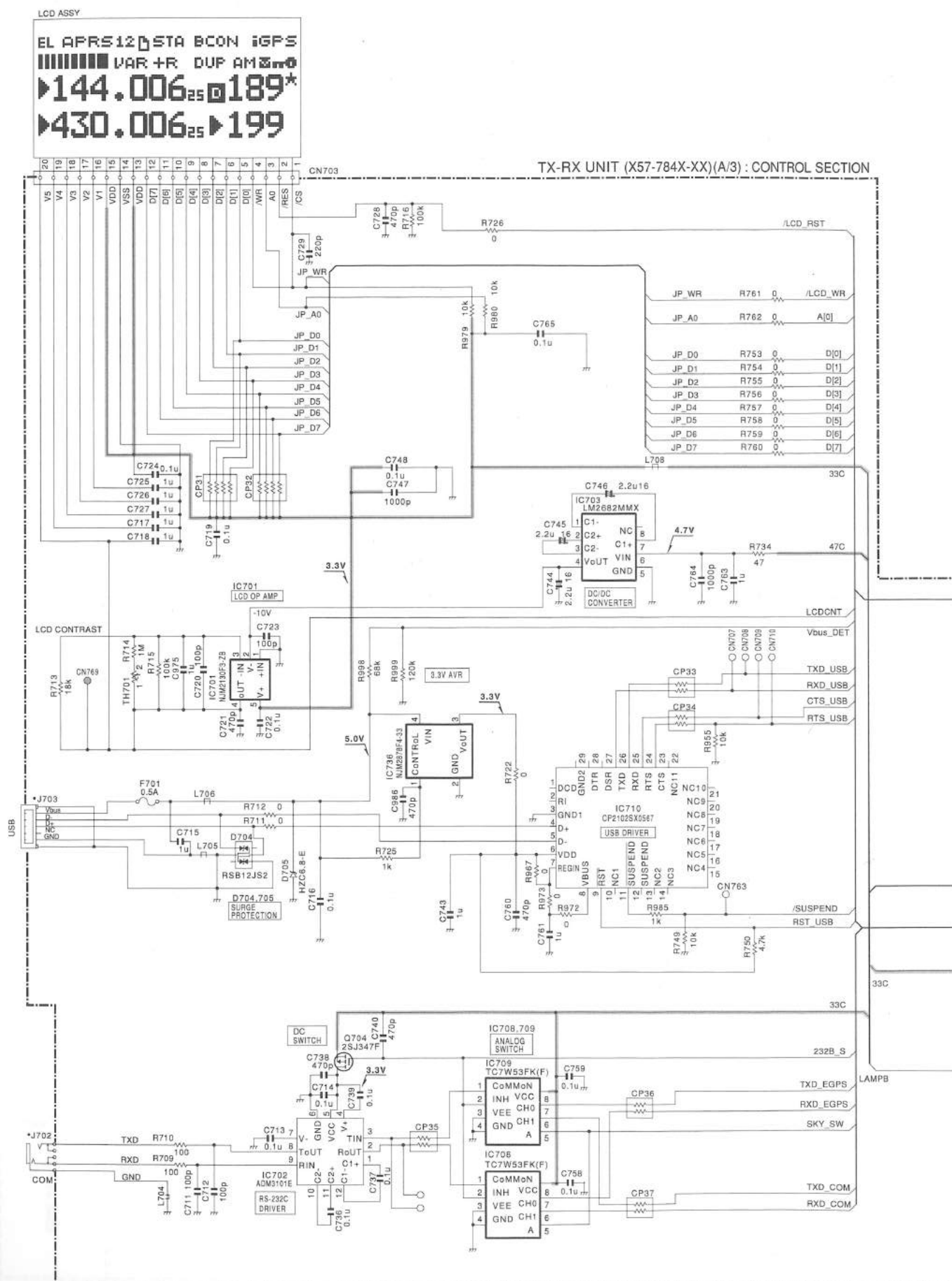
X57-784 (C/3)
TX-RX SECTION



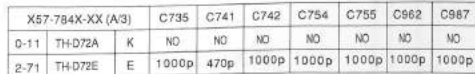
J641
E03-0190-05



TH-D72A/D72E SCHEMATIC DIAGRAM



TX-RX UNIT (X57-784X-XX) (A/3) : CONTROL SECTION



TX-RX UNIT (X57-784X-XX) (A/3) : CONTROL SECTION

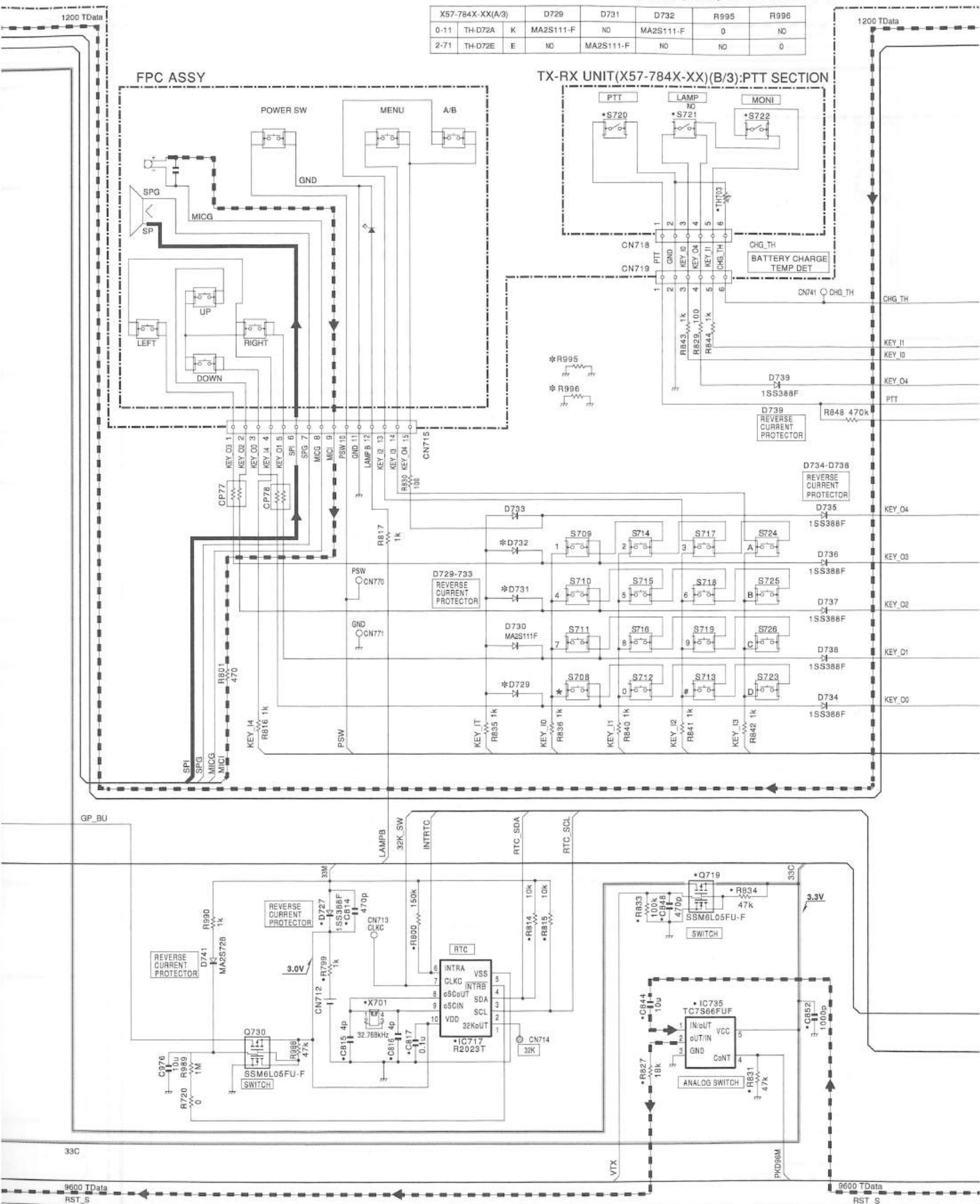


TH-D72A/D72E SCHEMATIC DIAGRAM

TX-RX UNIT (X57-784X-XX) (A/3) : CONTROL SECTION

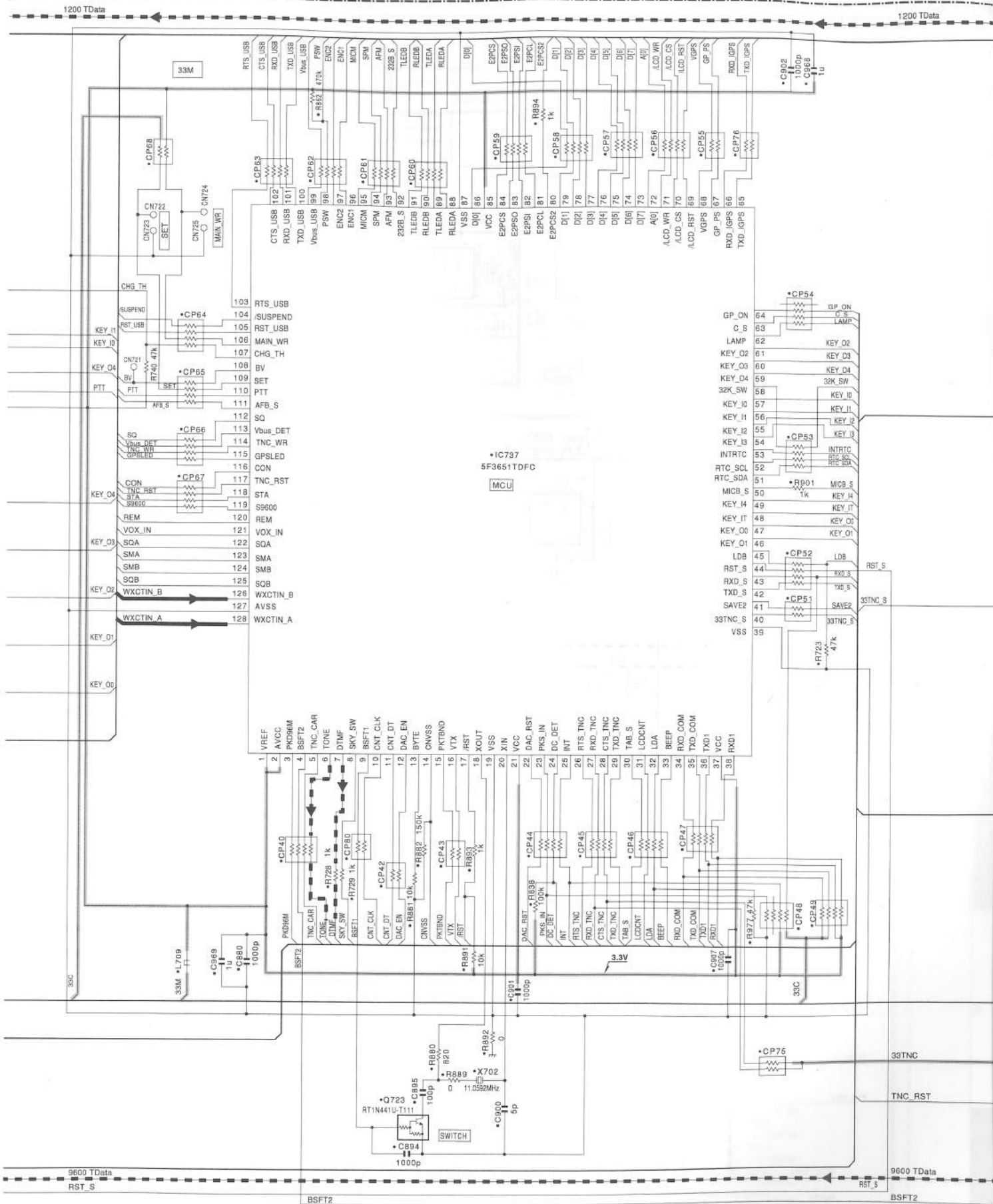
X57-784X-XX(A/3)	D729	D731	D732	R995	R996
0-11 TH-D72A K	MA2S111-F	NO	MA2S111-F	0	NO
2-71 TH-D72E E	NO	MA2S111-F	NO	NO	0

TX-RX UNIT(X57-784X-XX)(B/3):PTT SECTION



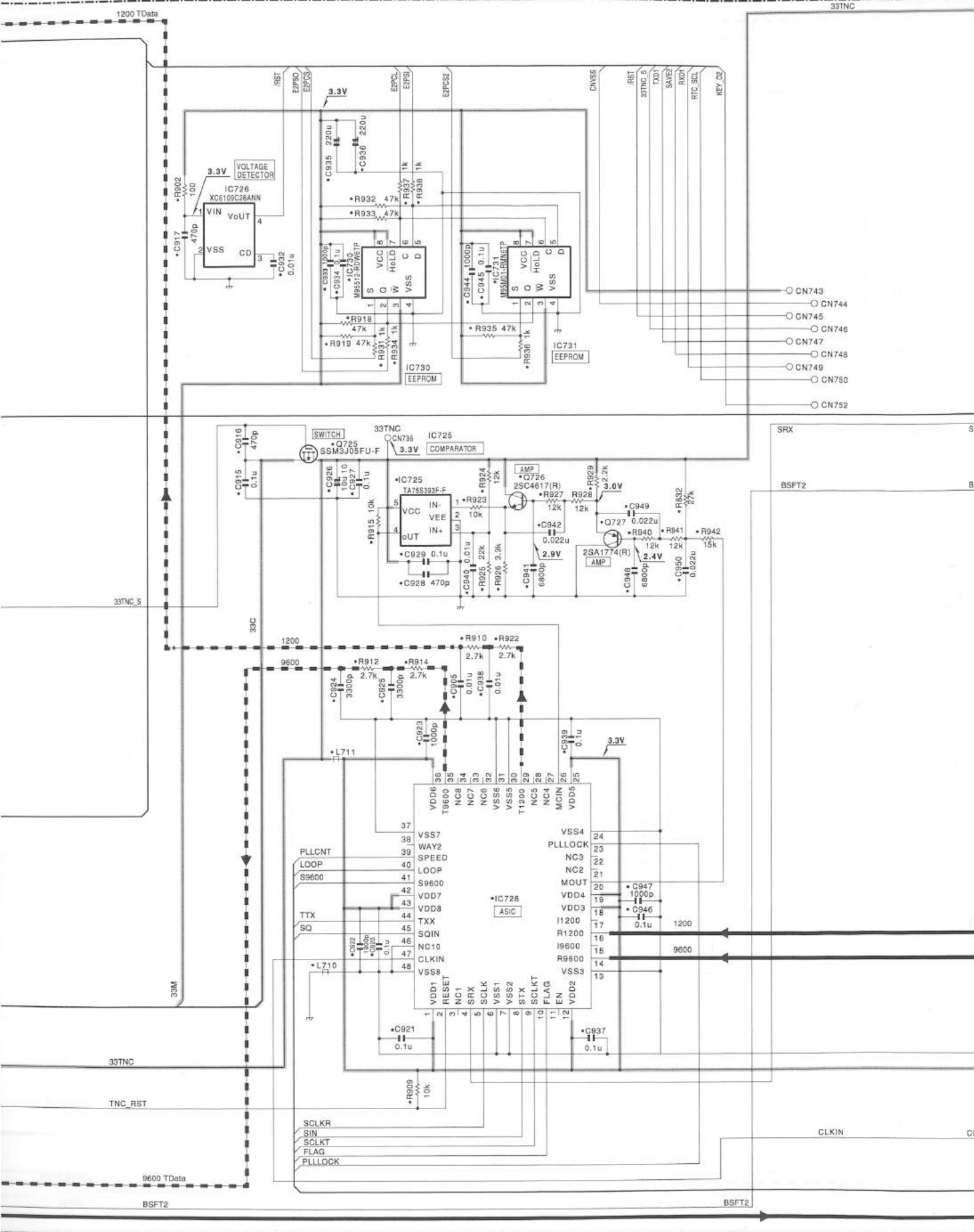
SCHEMATIC DIAGRAM TH-D72A/D72E

TX-RX UNIT (X57-784X-XX) (A/3) : CONTROL SECTION



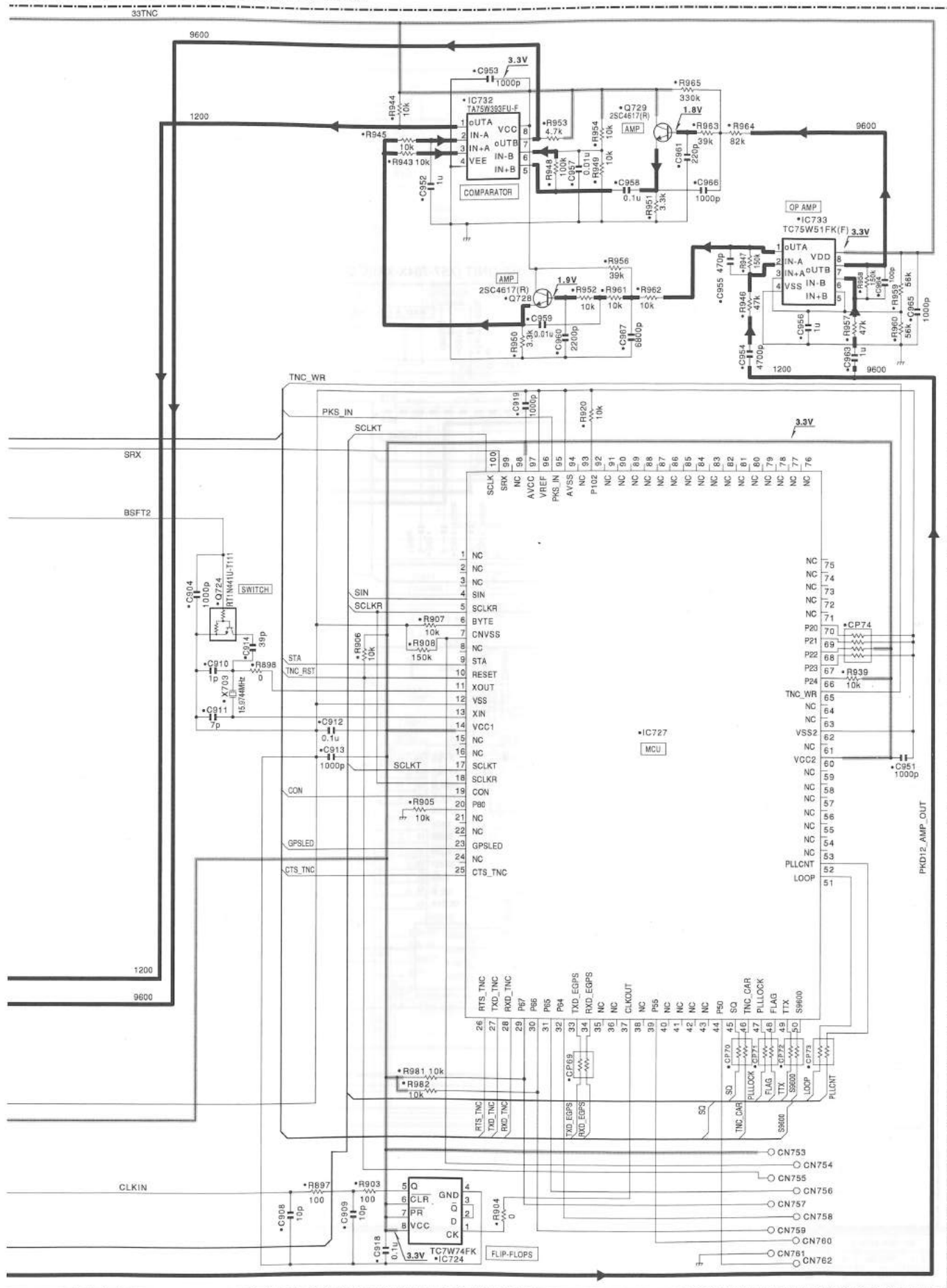
TH-D72A/D72E SCHEMATIC DIAGRAM

TX-RX UNIT (X57-784X-XX) (A/3) : CONTROL SECTION



SCHEMATIC DIAGRAM TH-D72A/D72E

TX-RX UNIT (X57-784X-XX) (A/3) : CONTROL SECTION

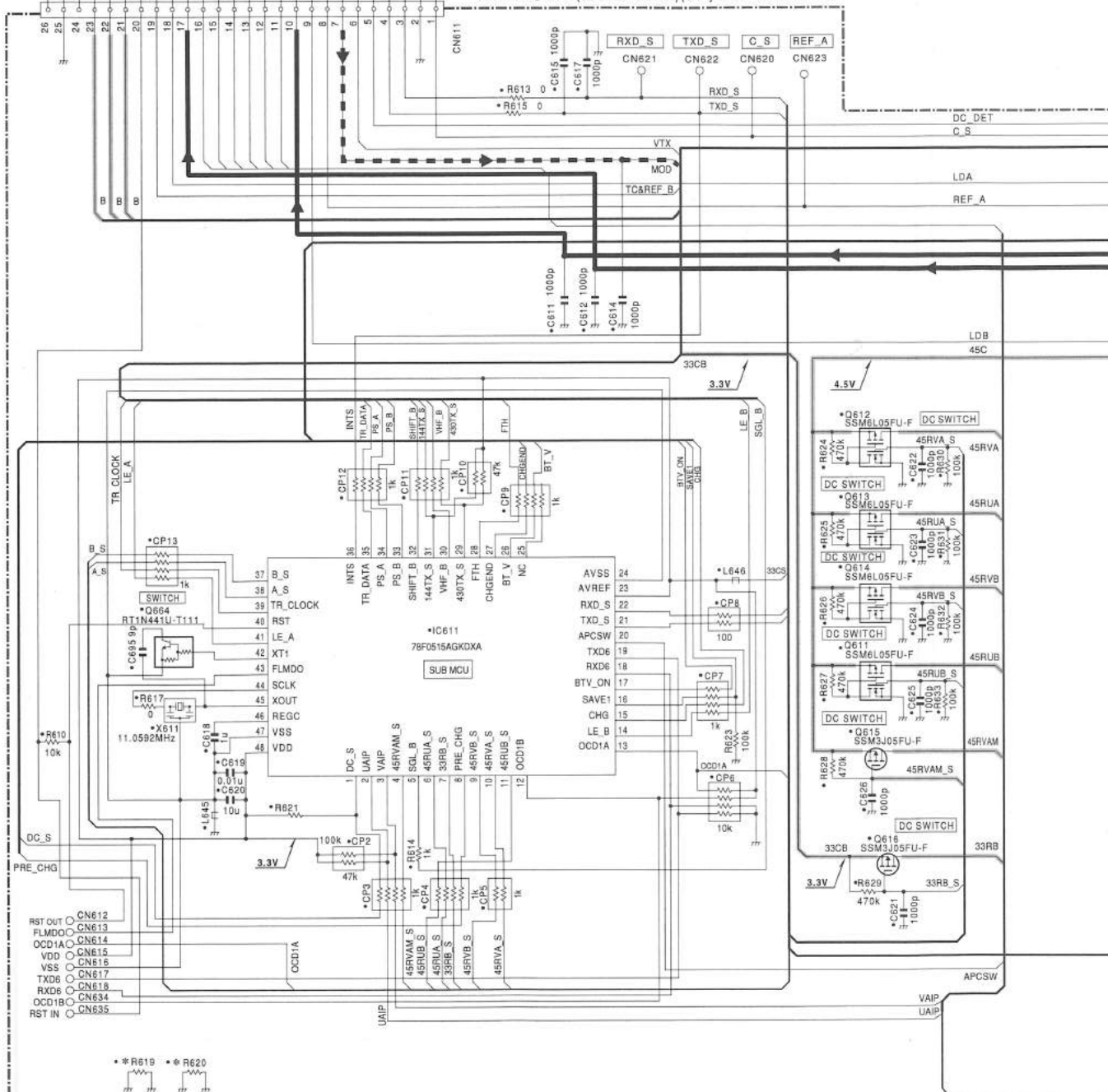


TH-D72A/D72E SCHEMATIC DIAGRAM

TX-RX UNIT : CONTROL SECTION

X57-784X-XX (A/3)-CN731

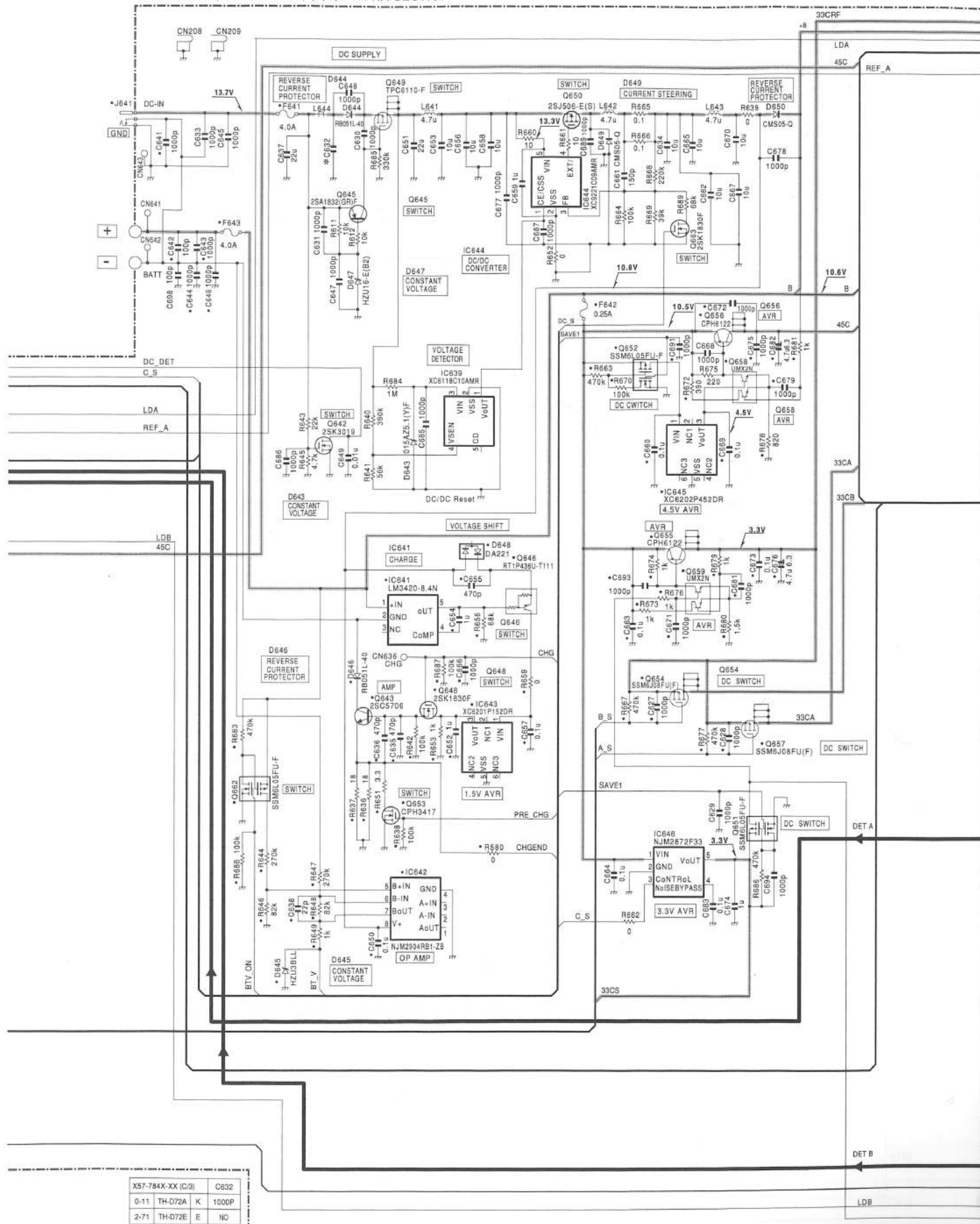
TX-RX UNIT (X57-784X-XX)(C/3) : TX-RX SECTION



X57-784X-XX (C/3)		R619	R620
0-11	TH-D72A	K	0
2-71	TH-D72E	E	NO

SCHEMATIC DIAGRAM TH-D72A/D72E

TX-RX UNIT (X57-784X-XX) (C/3) : TX-RX SECTION



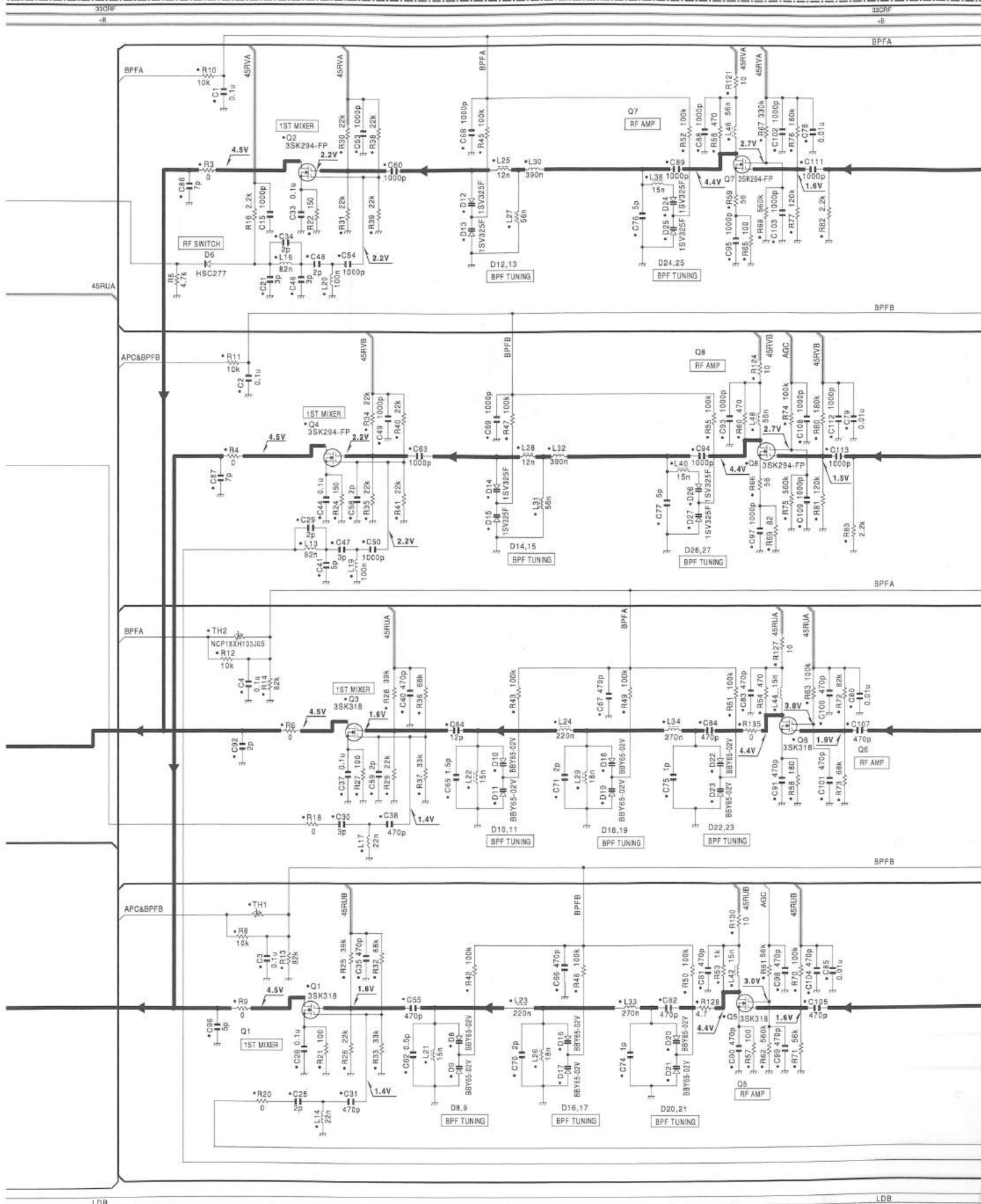
X57-784X-XX (C/3)	C632
0-11 TH-D72A K	1000P
2-71 TH-D72E E	NO

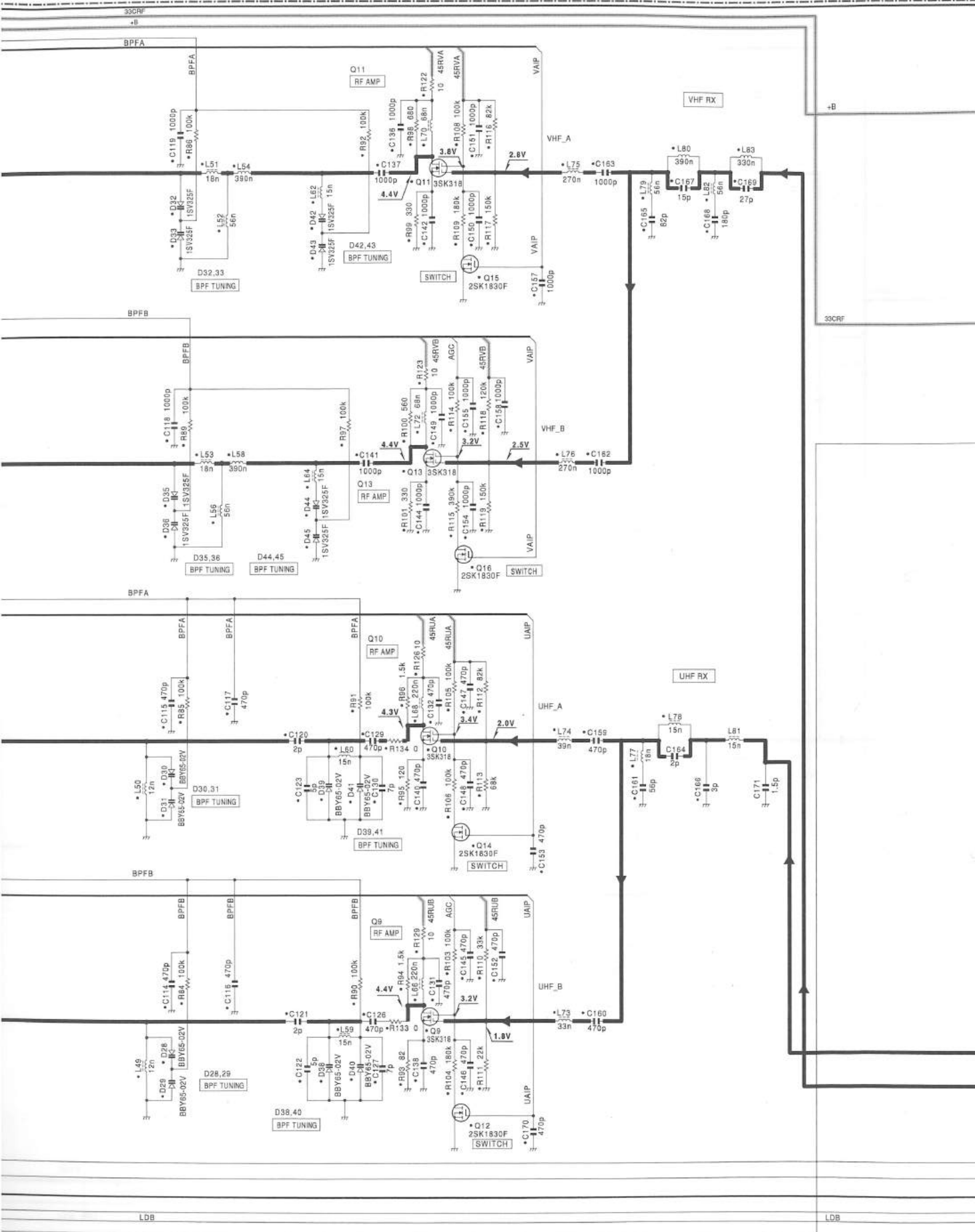
TX-RX UNIT (X57-784X-XX) (C/3) : TX-RX SECTION



SCHEMATIC DIAGRAM TH-D72A/D72E

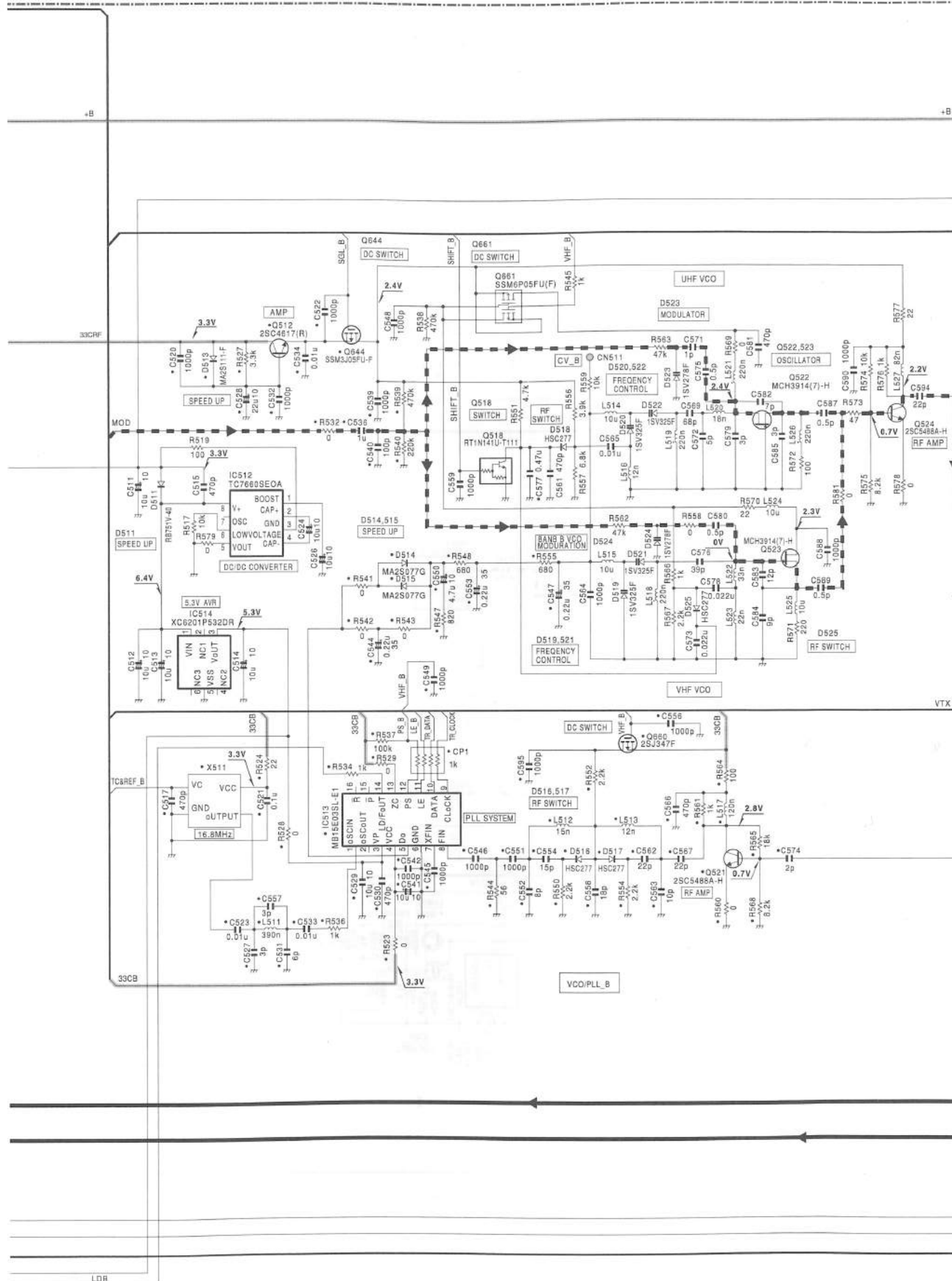
TX-RX UNIT (X57-784X-XX) (C/3) : TX-RX SECTION





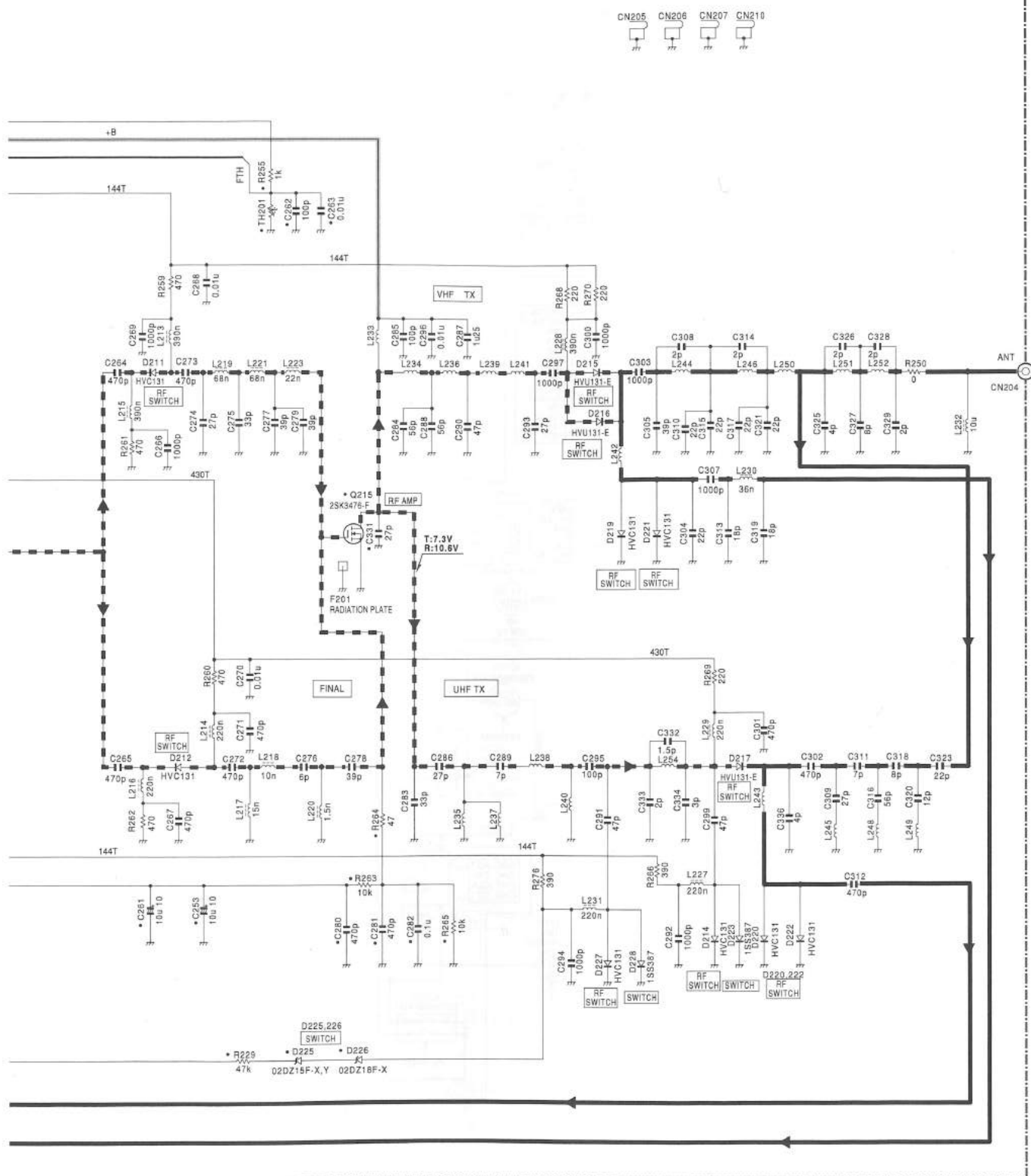
TH-D72A/D72E

TX-RX UNIT (X57-784X-XX) (C/3) : TX-RX SECTION

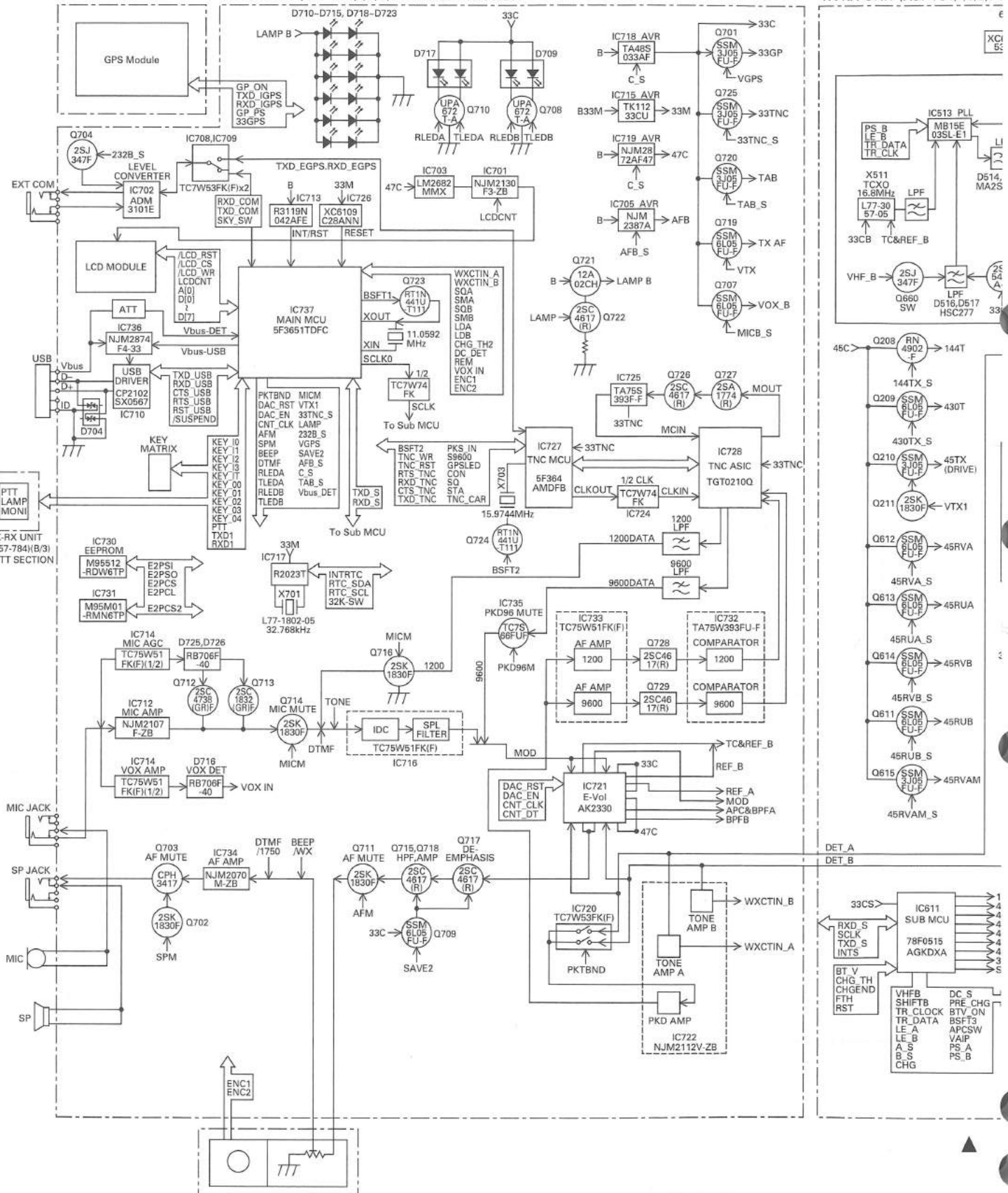


SCHEMATIC DIAGRAM TH-D72A/D72E

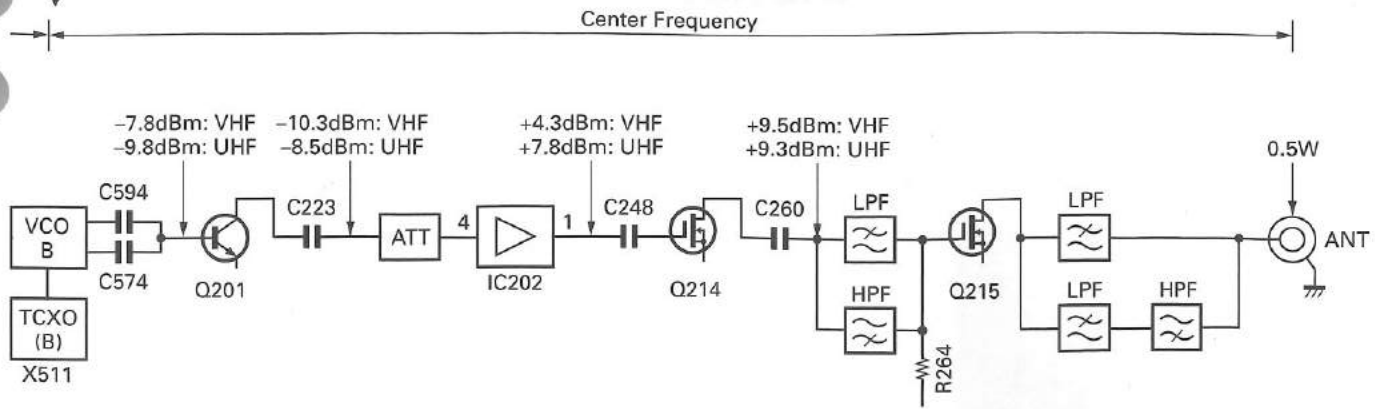
TX-RX UNIT (X57-784X-XX) (C/3) : TX-RX SECTION



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



LEVEL DIAGRAM TH-D72A/D72E



Note1: This is the value measured while removed from the chassis. Use a short transmission burst.

In the worst case scenario, some parts will be damaged. During this test, some parts will reach high temperature.

Note2: For the 1kHz MOD to become 8mVrms, set the MIC input terminal to AG.

Note3: Set the transmission output to Low.

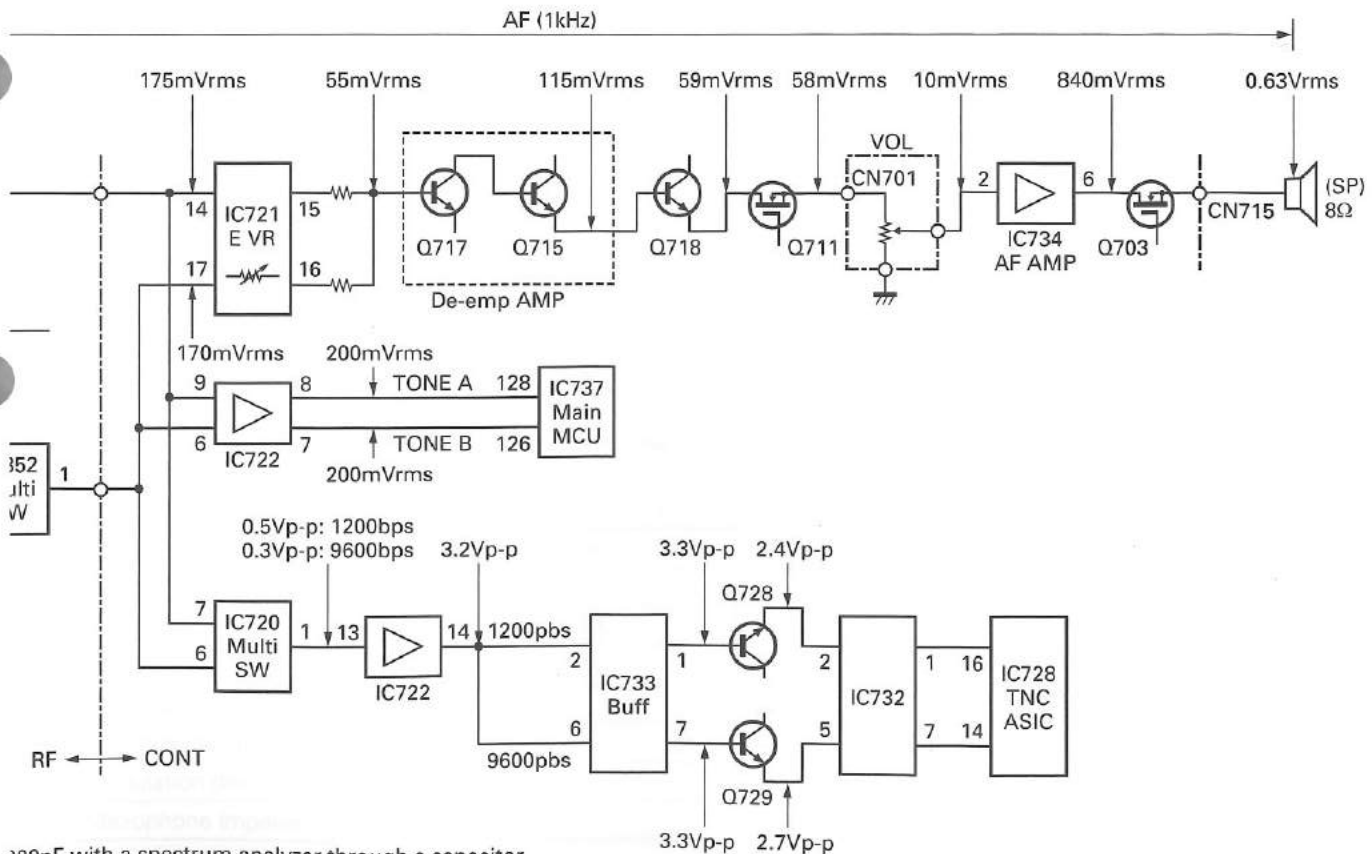
Note4: Connect a 50Ω terminal load or power meter to the ANT terminal.

Note5: When measuring data levels of 1200/9600bps, transmit the BEACON at 1200bps and 9600bps.

Refer to the instruction manual for the settings.

Note6: The RF levels for each point, other than for the ANT terminal, are measured at 1000pF with a spectrum analyzer through a capacitor.

Note7: Measure the AF level and Data level values with an oscilloscope.



100pF with a spectrum analyzer through a capacitor.

generator by a no modulation from ANT connector.

1 oscilloscope when the -60dBm standard signal generator signal modulated by a 1kHz modulation frequency and AF output was adjusted to 0.63V/8Ω by the AF VR.

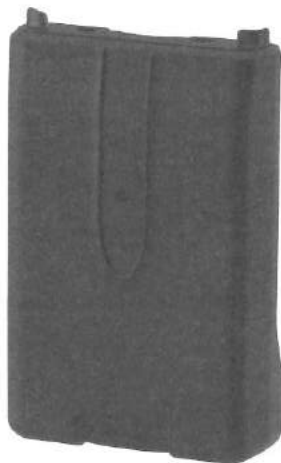
oscilloscope at each point, where the data level inputs a -60dBm SSG signal to the VHF zone frequency using the following settings.

TH-D72A/D72E

OPTIONAL ACCESSORIES

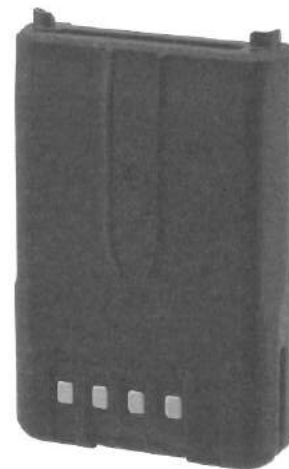
BT-15

Battery Case (6 AAA/LR03)



PB-45L

Li-ion Battery Pack (7.4V, 1800mAh)



SPECIFICATIONS

General

Frequency range	Band A & B	TH-D72A	TX (VHF)	144 ~ 148MHz
			TX (UHF)	430 ~ 450MHz
		TH-D72E	TX (VHF)	144 ~ 146MHz
			TX (UHF)	430 ~ 440MHz
	Band A		RX (VHF)	136 ~ 174MHz
			RX (UHF)	410 ~ 470MHz
	Band B		RX (VHF)	118 ~ 174MHz
			RX (UHF)	320 ~ 524MHz
Mode				F1D/ F2D/ F3E
Antenna impedance				50Ω
Operating temperature range				-20°C ~ +60°C (-4°F ~ +140°F)
				with PB-45L -10°C ~ +50°C (+14°F ~ +122°F)
Rated voltage	External power supply (DC IN)			DC 12.0 ~ 16.0V (13.8V nominal)
	Battery terminals			DC 5.5 ~ 9.0V (7.4V nominal)
Ground method				Negative
Frequency stability				Within ±5ppm (-10°C ~ +50°C)
Current	Receive with no signals	Single band	Approx. 100mA	
		Dual band	Approx. 150mA	
	Battery Saver ON (Single band)			Approx. 30mA
	TNC ON with no signals (Single band)			Approx. 135mA
	Transmit with H, 13.8V (DC IN)			Approx. 1.6A
	Transmit with H, 7.4V (PB-45L)			Approx. 2.0A
	Transmit with L, 7.4V (PB-45L)			Approx. 800mA
	Transmit with EL, 7.4V (PB-45L)			Approx. 500mA
	GPS only mode			Approx. 60mA
Dimensions (W x H x D) *1		Projections not included	58 x 121.3 x 33.2 mm (2.28" x 4.78" x 1.31")	
		Projections included.	58 x 140 x 39.8 mm (2.28" x 5.51" x 1.57")	
Weight *2				Approx. 370g (13.1oz)

*1: With Battery pack (PB-45L).

*2: Antenna, Battery pack (PB-45L) and Belt clip included.

Transmitter

RF power output	H	5W/ Approx. 2W (with BT-15)
	L	Approx. 0.5W
	EL	Approx. 0.05W
Modulation		Reactance
Maximum frequency deviation		FM: ±5kHz, N-FM: ±2.5kHz
Spurious radiation (at high transmit power)		Less than -60dB
Modulation distortion (300Hz ~ 3kHz)		Less than 3%
Microphone impedance		2kΩ

SPECIFICATIONS

Receiver

Circuitry		Double super heterodyne
Intermediate Frequency (IF)	1st IF (Band A/ Band B)	49.95MHz/ 45.05MHz
	2nd IF (Band A/ Band B)	450kHz/ 455kHz
Sensitivity (12dB SINAD)	Band A/ Band B	Less than 0.18µV/ 0.22µV
Squelch sensitivity		Less than 0.13µV
Selectivity	-6dB	More than 11kHz
	-50dB	Less than 30kHz
Audio output (at 8Ω/ 10% distortion)		More than 300mW (at 7.4V)

• Sensitivity (approx.) (excluding 144, 430/440MHz band)

Frequency range	Band A	Band B	
	FM: 12dB SINAD	FM: 12dB SINAD	AM: 10dB S/N
118 ~ 135.995MHz	-	0.28µV	0.4µV
136 ~ 143.995MHz	0.28µV	0.28µV	-
TH-D72A: 148 ~ 173.995MHz TH-D72E: 146 ~ 173.995MHz	0.22µV	0.22µV	-
320 ~ 339.995MHz	-	1.26µV	2.24µV
340 ~ 379.995MHz	-	0.56µV	1.0µV
380 ~ 399.995MHz	-	0.4µV	0.4µV
400 ~ 409.995MHz	-	0.22µV	-
410 ~ 429.995MHz	0.22µV	0.22µV	-
TH-D72A: 450 ~ 469.995MHz TH-D72E: 440 ~ 469.995MHz	0.22µV	0.22µV	-
470 ~ 499.995MHz	-	0.4µV	-
500 ~ 523.995MHz	-	1.0µV	-

Note:

- All specifications (General, Transmitter and Receiver) are guaranteed within the amateur radio band.
- Specifications are subject to change without notice, due to advancements in technology.

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