

TH-G71A/E

SERVICE MANUAL



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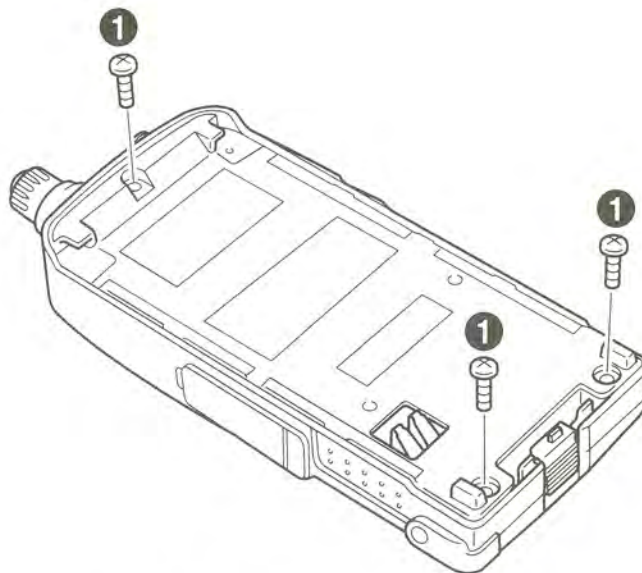
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SPECIFICATIONS	BACK COVER

Photo is TH-G71A

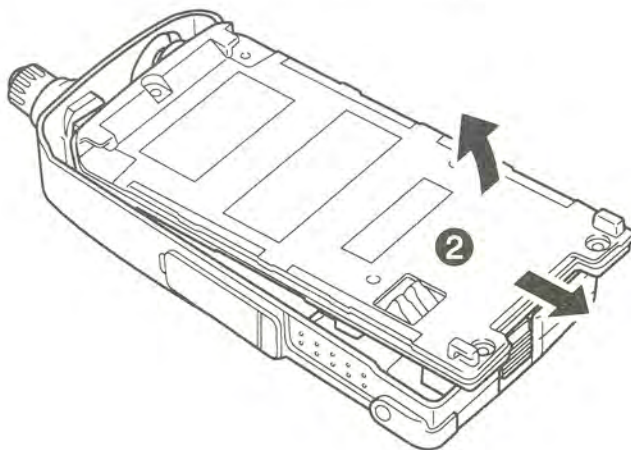
TH-G71A/E

DISASSEMBLY FOR REPAIR

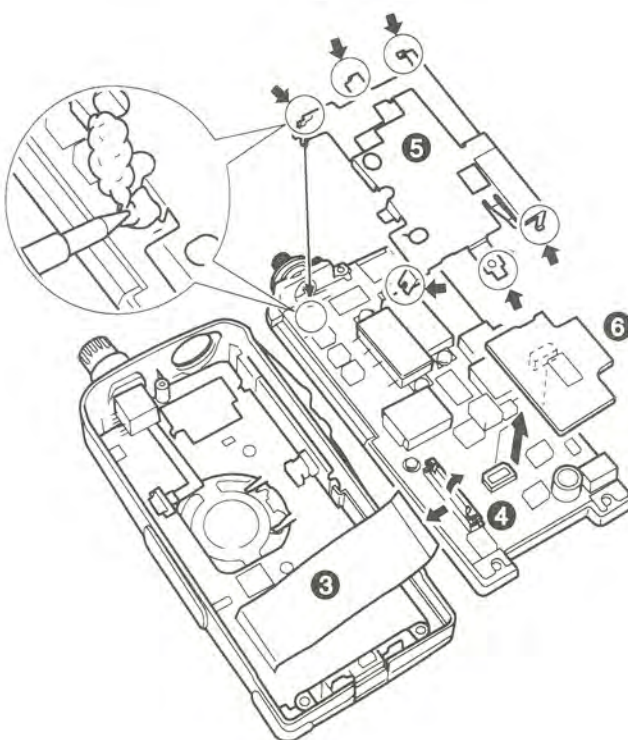
1. Remove the battery pack and whip antenna, then remove the three screws (1) holding the chassis.



2. Pull the chassis slowly from the antenna side towards the direction shown by the arrow (2). The antenna connector comes apart and the upper case is separated from the lower case. (However, the flat cable is connected.)



3. The flat cable (3) can be removed by releasing the connector stopper (4). The TX-RX unit is attached to the chassis and the switch unit is attached to the front case.
4. The component side of the TX-RX unit is opened by removing the six (5) soldered points from the shield cover. The daughter board is connected with a connector. Remove the board by lifting it in the direction indicated by the arrow (6).



Precautions for assembly

- Install the chassis in the case before installing the ANT gasket.
- Check that the PTT installation fixture and the ground spring are inserted all the way in.

CIRCUIT DESCRIPTION

1. Frequency configuration

- The TH-G71A/E has two VCOs for the VHF and UHF bands, but has only one PLL.
- Both VHF and UHF band signals cannot be received at the same time.
- The first local signal for the VHF and UHF bands are generated by the VCO.
- The first local signal for the 800MHz band is produced by doubling the VCO frequency for the UHF band.
- The second local signal is generated by tripling the reference signal frequency.
- The frequency configuration is shown in Figure 1 and Table 1.

Receiving system	Double conversion super heterodyne		
		UHF	VHF
	1st LOCAL (38.85MHz)	Lower	Upper
2nd LOCAL (450KHz)	Lower	Lower	
Transmitting	Direct conversion oscillating amplification		
Modulation	Variable reactance phase		

Table1

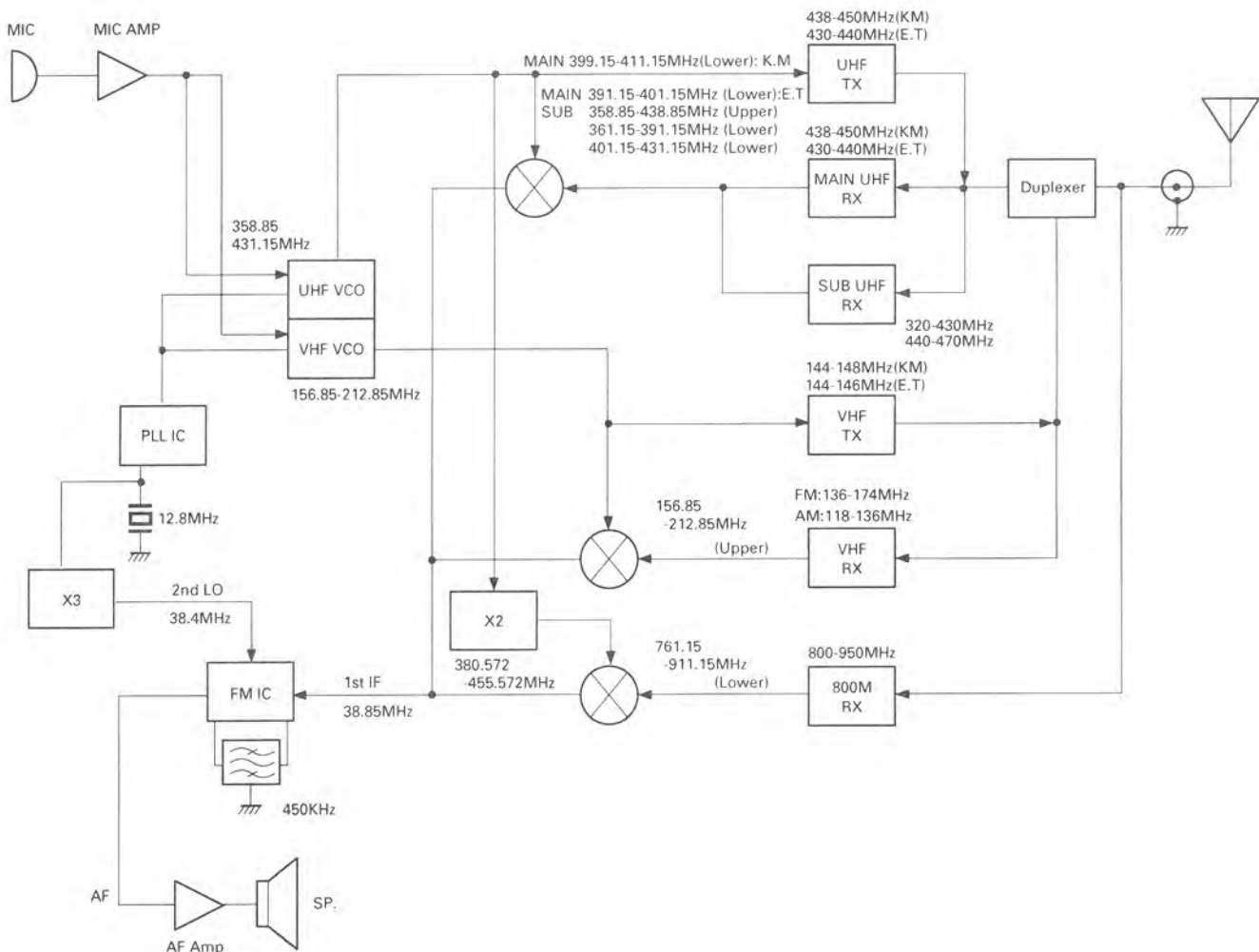


Fig.1 Frequency configuration

CIRCUIT DESCRIPTION

2. Receiver system

■ UHF reception

The first local signal (Lower Hetero •••• Upper Hetero for 300 to 400 MHz reception.) generated by the U-VCO is mixed with the desired signal to produce a 38.85-MHz IF signal. It is then mixed with the second local signal (Lower Hetero) generated by the X1 crystal oscillator circuit to produce an audio signal.

■ VHF reception

The first local signal (Upper Hetero) generated by the V-VCO is mixed with the desired signal to produce a 38.85-MHz IF signal. It is then mixed with the second local signal (Lower Hetero) generated by the X1 crystal oscillator circuit to produce an audio signal.

■ 800MHz band reception

The first local signal (Lower Hetero) generated by doubling the U-VCO frequency is mixed with the desired signal to produce a 38.85-MHz IF signal. It is then mixed with the second local signal (Lower Hetero) generated by the X1 crystal oscillator circuit to produce an audio signal.

■ Audio circuit

- The audio signal (AF) detected by IC4 passes through IC5 (AF switch), and is filtered by Q309. The resulting signal passes through a volume, is amplified by audio amplifier IC312 and output from the internal or external speaker.
- The beep tone and the DTMF signal are output from the microcomputer (IC301).

Receiver system

Item	Rating
Center frequency (fo)	38.85MHz
Pass bandwidth	3dB or less at ± 7.5 kHz or more
Attenuation bandwidth	36dB or less at ± 25 kHz or less
Guaranteed attenuation	$f_o \pm 1$ MHz or less at 80dB or more
Spurious	$f_o \pm 1$ MHz or less at 40dB or more
Ripple	1.0dB or less
Minimal damage	3.0dB or less
Terminating impedance	$550 \Omega \pm 10\%$ // 2.5 pF ± 0.5 pF

Table 2: MCF(L71-0481-05):TX-RX UNIT XF1

Item	Rating
Center frequency (fo)	450 ± 1.5 kHz
6dB bandwidth	± 7.5 kHz or more
40dB bandwidth	± 15.0 kHz or less
Guaranteed attenuation	450 kHz ± 100 kHz or less at 27dB or more
Insertion loss	450 kHz or less at 6dB or less
Ripple	± 5.0 kHz or less at 1.5dB or less

Table 3: Ceramic filter (L72-0945-05):TX-RX UNIT CF1

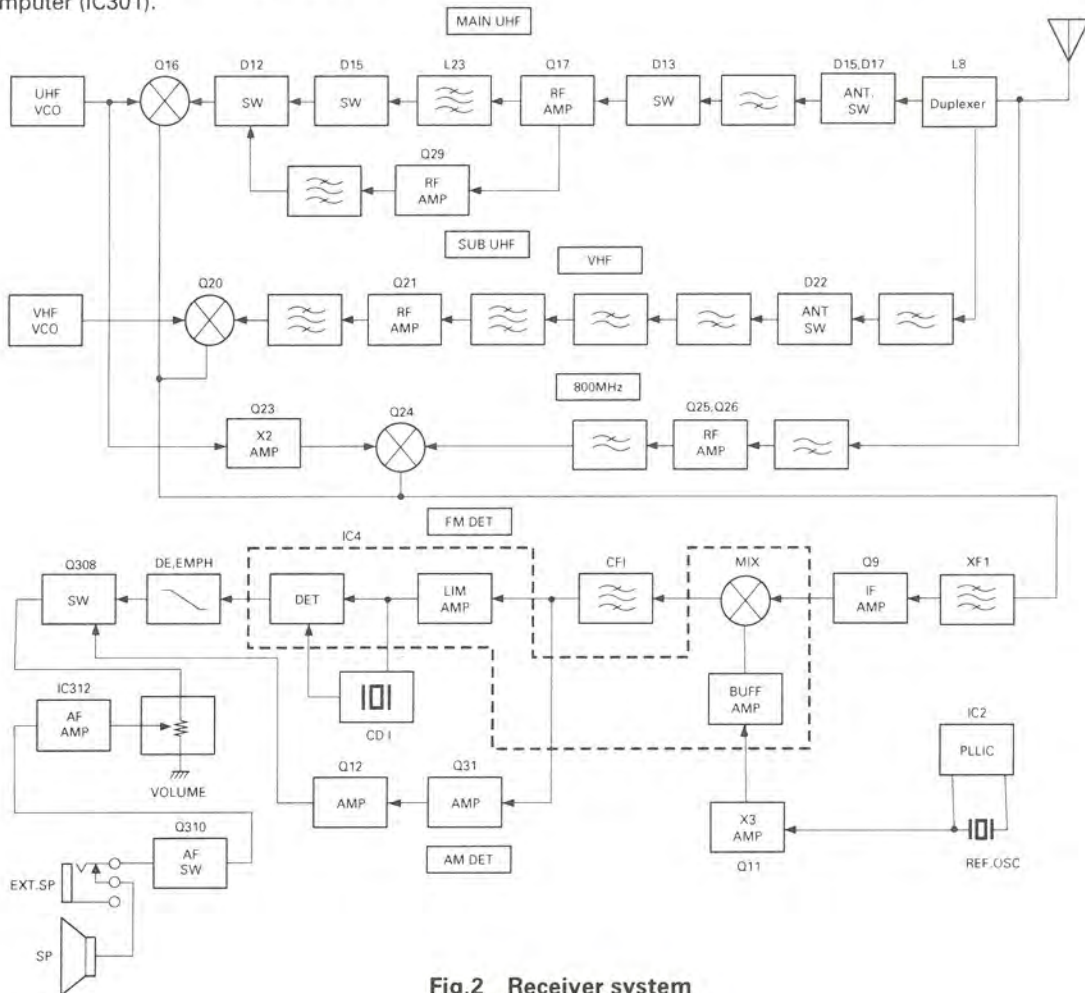


Fig.2 Receiver system

CIRCUIT DESCRIPTION

3. Transmitter system

- The transmitter system is shown in Figure 3.

Modulator Circuit

IC313 switches between the internal and external microphones. The audio signal from the microphone is pre-emphasized, limiter-amplified and splatter-filtered by IC311. Frequency shifts are adjusted by VR330 and VR331.

The modulation signal is applied to the varicap for VCO modulation for the VHF and UHF and reactance-modulated.

When the DTMF is used, the input terminal is opened by IC311.

Driver and final amplifier

The UHF band VCO output is amplified by three amplifiers, and the VHF band VCO output is amplified by two amplifiers. The resulting signal goes to the power module for each band. The signal then passes through the antenna switch for each band and the chip duplexer (L8) and goes to the antenna.

APC circuit

The APC circuit detects the drain current of the power module and controls the transmission output to provide stable transmission output. The voltage at R152, R153, and R154 is amplified by IC302 and Q301, and the difference between the resulting voltage and the reference voltage of each frequency from port 44 of IC301 is detected by IC303 to determine the APC voltage.

The APC voltage is used to control the control pin of the power module.

Temperature protection circuit

If the thermistor detects about 80°C, IC301 reduces the APC voltage to prevent thermal breakdown of the power module.

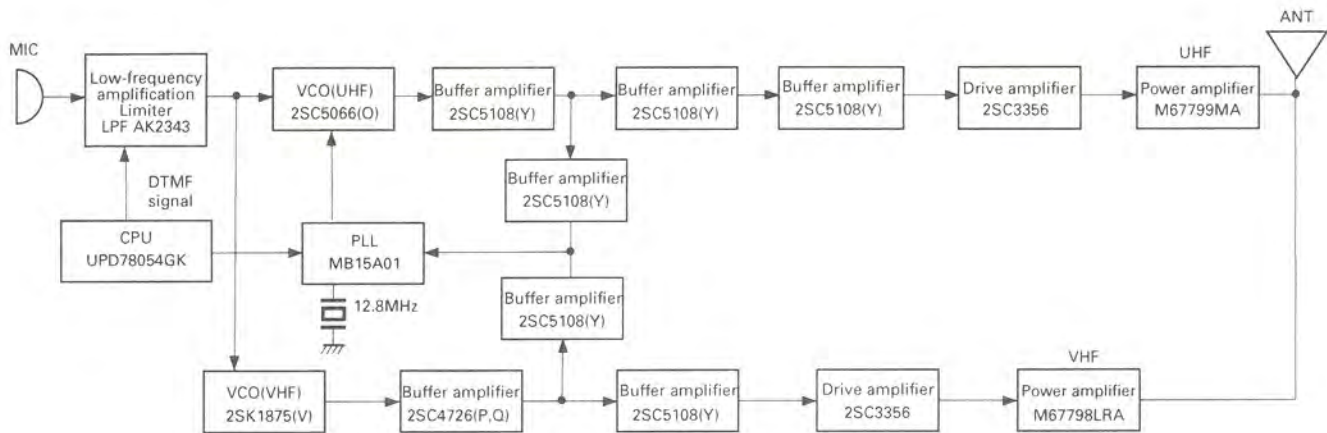


Fig.3 Transmitter system

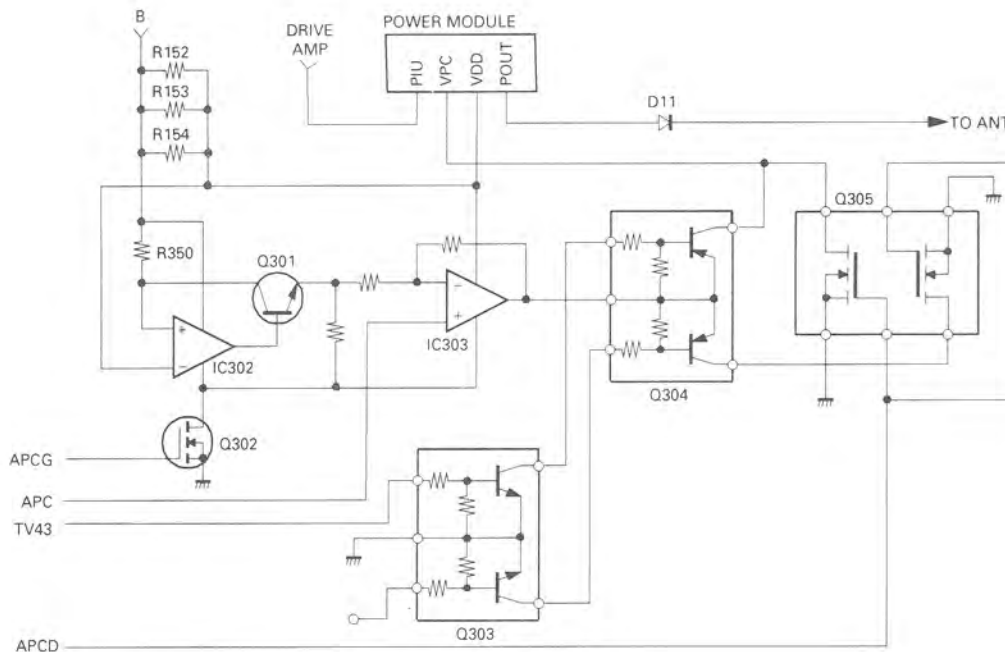


Fig.4 APC circuit (UHF only)

CIRCUIT DESCRIPTION

4. PLL circuit

A single PLL circuit is shared for both the VHF and UHF bands.

The internal oscillator circuit of the PLL IC (IC2) is used as the reference oscillator to supply the oscillation signal to the tripling transistor that produces the PLL reference signal and the second local oscillator signal.

Reference oscillator circuit

X1: The 12.8MHz crystal is oscillated by IC2, and the reference signal frequency is divided to produce the 5kHz or 6.25kHz reference frequency.

Phase comparison

The comparison frequency is produced by amplifying the VCO output by Q5 (UHF) or Q6 (VHF) and dividing it by the pulse-swallow type PLL IC (IC2). The PLL synthesizer with 5kHz, 6.25kHz, 10kHz, 12.5kHz, 15kHz, 20kHz, 25kHz, 30kHz, 50kHz and 100kHz steps is configured by comparing the phases of the reference frequency obtained by dividing X1.

Lock voltage (VCO control voltage)

The pulse output from IC2 pins 15 and 16 according to the phase difference between the reference frequency and comparison frequency passes through the charge pump (Q7, Q8) and ripples are removed by a low-pass filter to produce the lock voltage. The power supply voltage of the charge pump is doubled to about 7 V by the DC/DC converter (IC308).

VCO (KCH36)

The KCH36 contains two VCO circuits.

The UHF VCO is a colpitts oscillation circuit consisting of a bipolar transistor Q2 that generates the desired frequency directly. The oscillation frequency is varied by applying the VCO control voltage to the varicap D1 and D2. The SHIFT pin goes low during reception to turn Q1 and D4 OFF and change the oscillation frequency. The audio signal is applied to the varicap D3 and the oscillation frequency is modulated during transmission.

The VHF VCO is a colpitts oscillation circuit consisting of FET: Q102 that generates the desired frequency. The oscillation frequency is varied by applying the VCO control voltage to the varicap D101 and D102. The SHIFT pin goes high during reception to change the oscillation frequency of Q101 and D104. The audio signal is applied to the varicap D103 and the oscillation frequency is modulated during transmission.

Unlock detection circuit

When the PLL is unlocked, a low signal is output from the IC2 LD pin. The LD pin voltage is detected by the microcomputer (IC301) to control the transmission/reception switching timing.

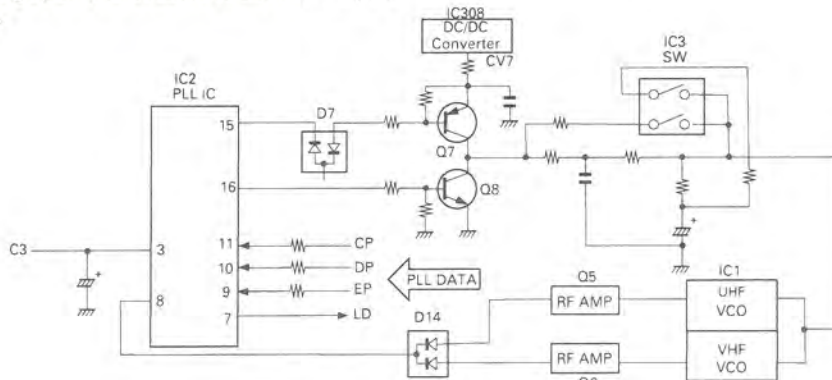


Fig.5 PLL circuit

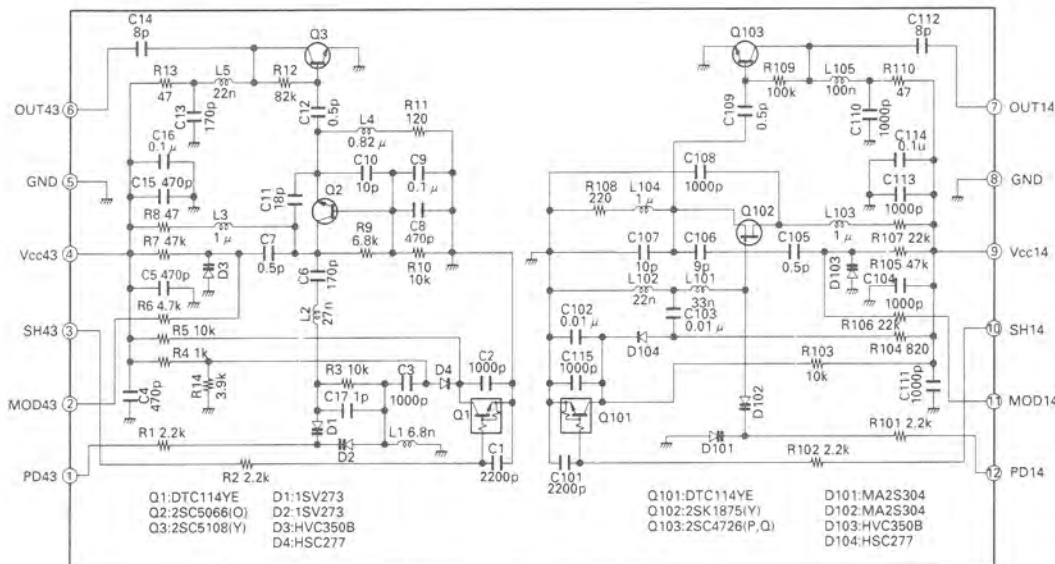


Fig.6 VCO circuit (KCH36)

CIRCUIT DESCRIPTION

5. Power supply circuit

■ Ni-Cd battery charging circuit

The constant-current circuit (Q321, D322) supplies about 70 mA to the Ni-Cd battery from the external power supply connected to the DC IN terminal. The constant-current circuit does not work if no external power source is connected to the DC IN terminal.

■ Power switching circuit

The power supply circuit is configured as shown in Figure 7. This circuit provides power to the following components:

- B : Power to the power module
- M3 : Power to the microcomputer, EEPROM, and reset circuit
- M3S : Power to the LCD, external speaker/microphone, DC/DC converter, microphone changeover switch, and AF AVR reference voltage
- C3 : Baseband IC, BUSY/ON AIR LED, PLL circuit (C3U, C3V), receiver circuit (RV36, RV43, RV80, RV14, AMV, IFV)
- TV : Power to the transmitter circuit (TV14, TV43)

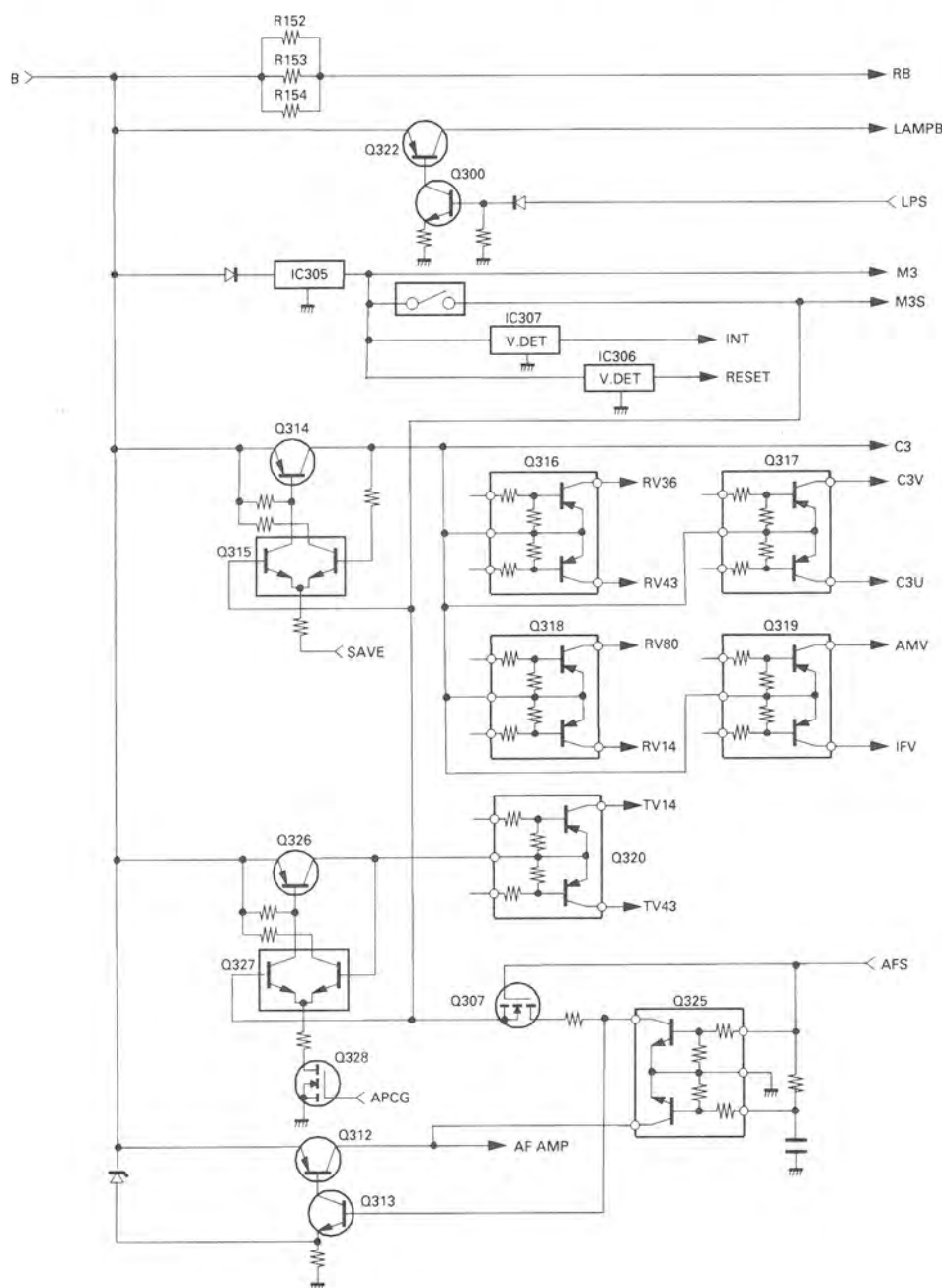


Fig.7 Power supply circuit

CIRCUIT DESCRIPTION

6. Microcomputer and peripheral circuits

Reset and backup circuits

When power is supplied to the set, the reset circuit makes the VDD and INT ports of the microcomputer (IC301) high due to C353 charging.

The RST port becomes active when the microcomputer starts operation, and goes inactive after the time constant determined by R368 and C357.

If the voltage provided to the set falls and IC305 cannot supply

a sufficient voltage to the load, the voltage drop (3.0 V) at the output side of IC305 is detected and the INT port goes low. The microcomputer enters the backup mode, outputs data to IC309 (EEPROM), then enters the stop mode. The EEPROM receives and stores data while C353 is discharging. If the voltage falls below 2.5 V, the voltage detection IC (IC306) detects the voltage drop, and makes the RST port active low.

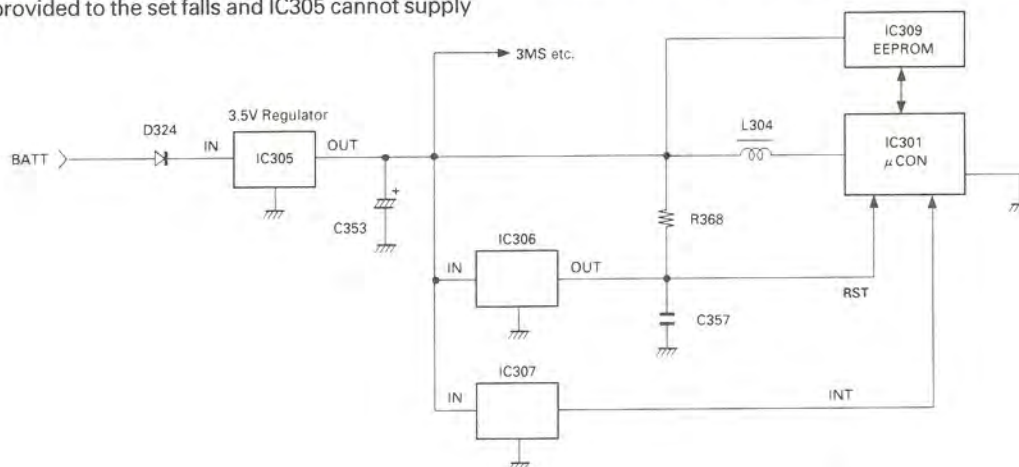


Fig.8 Reset and backup circuits

Battery voltage detection circuit

The power supply voltage is divided by R360 and R361 and applied to the analog port (pin 80) of the microcomputer. If the power supply voltage exceeds 17.5 to 22.0 V, a beep sounds as a warning. The voltage input to the microcomputer during transmission is converted from analog to digital, and it corresponds to the BATT display on the LCD.

Battery saver circuit

If squelch is OFF, scan is OFF, save is ON, or a key input state continues for ten seconds, the battery save mode becomes effective.

Q315 is turned ON and OFF for about 150 ms at 1000ms intervals according to the output signal from the SAVE pin of the microcomputer. The power supply for each component is turned ON and OFF to reduce current consumption at standby.

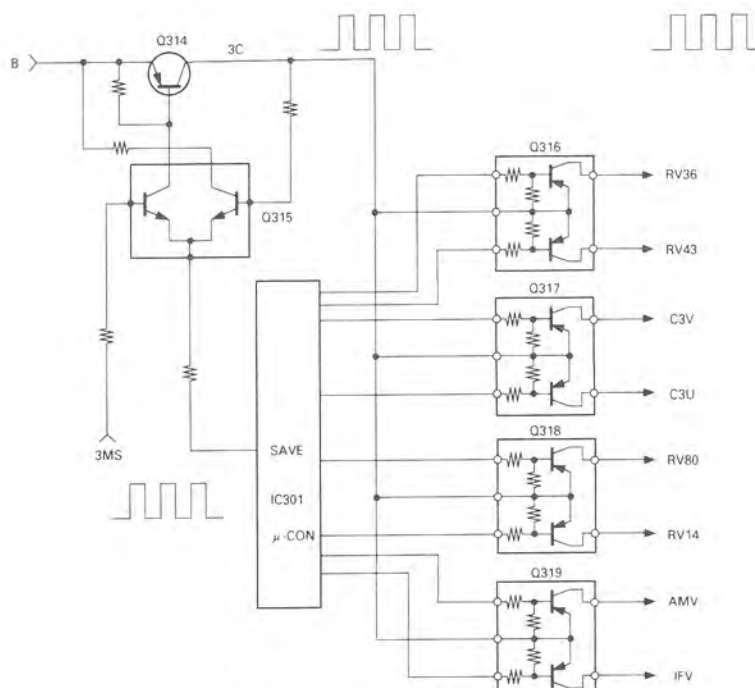


Fig.9 Battery saver circuit

CIRCUIT DESCRIPTION

■ LED drive circuit

The LCD and key illumination LED comprise the lamp AVR and are controlled with the LPS port (pin 16) of the microcomputer.

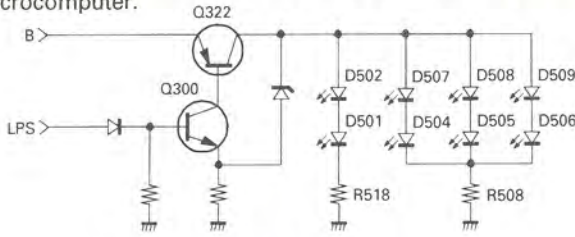


Fig.10 LED drive circuit (KEY LED)

The ON AIR/BUSY LED is controlled by the D503 cathodes which are connected to microcomputer ports BYL and TXL.

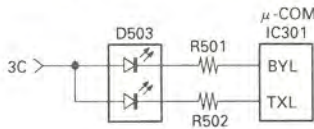


Fig.11 LED drive circuit (ON AIR/BUSY)

■ Key/encoder input circuit

The signals are input directly to the microcomputer as shown in Figure 12.

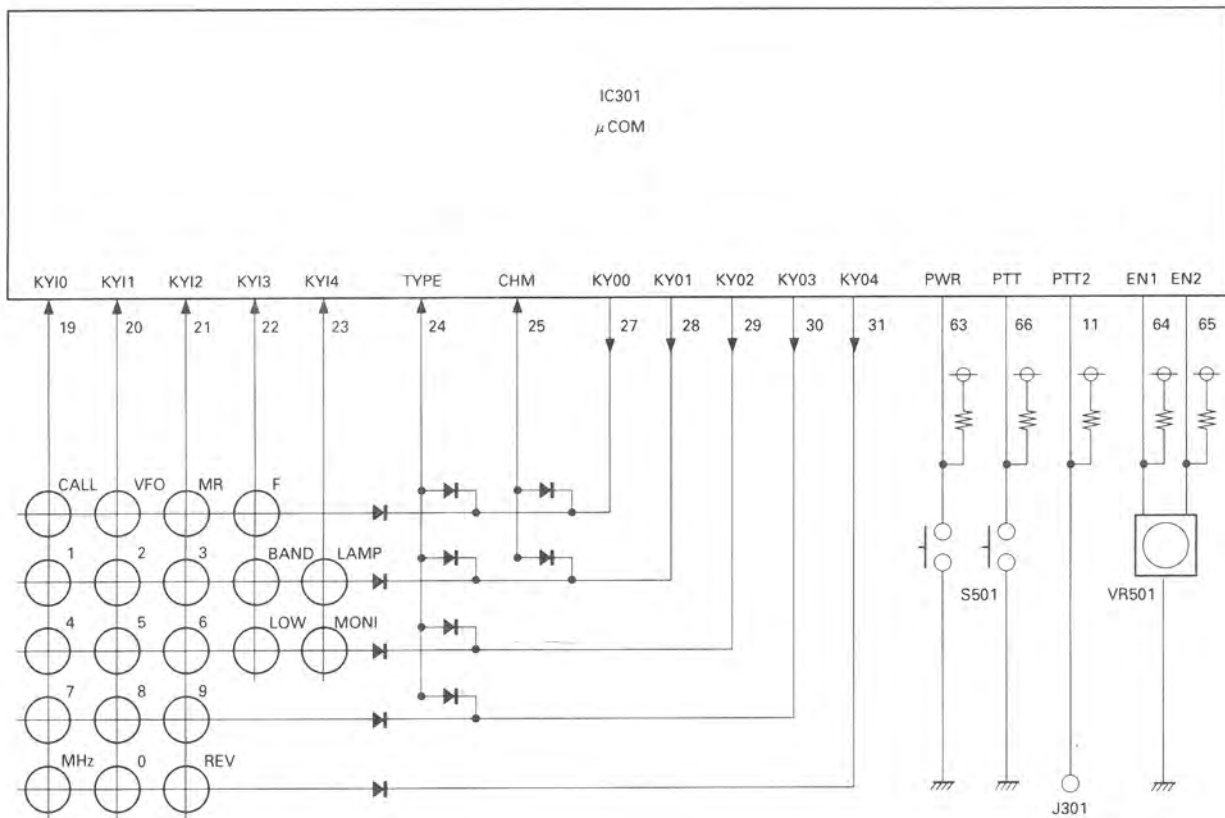


Fig.12 Key/encoder input circuit

■ CTCSS circuit

Tone frequency is set according to the serial data from the microcomputer (IC301). The tone signal passes through the deemphasis circuit and the amplifier (IC311) and goes to the CTCSS circuit.

If the tone matches, IC311 pin 14 goes low. The microcomputer checks the SDO pin and controls the MUTE and AFC pins of IC311.

To transmit a CTCSS signal, the signal output from IC311 pin 18 is synthesized with the audio signal and a modulated signal is output from IC311 pin 4.

■ DTMF

When a DTMF signal is transmitted, it is output from the DTMF port (pin 5) of the microcomputer, and modulated through the microphone amplifier (IC311). The DTMF signal can be monitored from the speaker through the AF amplifier while the signal is being transmitted.

DESCRIPTION OF COMPONENTS

Ref. No.	Use/Function	operation/Condition/Compatibility
IC1	VHF, UHFVCO	HIC
IC2	PLL IC	VHF, UHF common to VHF and UHF
IC3	2-circuit analog switch	Loop filter switching, speed up
IC4	FM IC	
IC5	Multiplexer	AM/FM detector output switching
IC8	Op amp	BPF tuning voltage amp
IC301	Microcomputer	
IC302	Rail input op amp	Detected voltage differential voltage amplifier
IC303	Rail input op amp	Reference voltage and detection voltage comparison, transmission output control voltage
IC305	3.5V regulator	Microcomputer, EEPROM power supply
IC306	2.5V detector	RESET voltage detection
IC307	3.0V detector	INT voltage detection
IC308	Multiplier voltage DC/DC comparator	7V charge pump power supply
IC309	EEPROM	
IC312	Audio amp	
IC313	Multiplexer	M input switching
IC500	LCD driver	
Q1	Ripple filter	VHF VCO
Q2	Ripple filter	UHF VCO
Q3	RF amp	UHF transmission reception common amp
Q4	RF amp	VHF transmission reception common amp
Q5	RF amp	UHF Fin amp
Q6	RF amp	VHF Fin amp
Q7,Q8	Charge pump	
Q9	IF amp	38.85 MHz
Q10	AGCSW	IF amp
Q11	3x amp	2nd local 38.4 MHz
Q12	450 kHz amp	3rd AM amp
Q13	Buffer amp	AGC
Q14	Noise amp	
Q15	Drive amp	UHF 2nd drive
Q16	Mixer	Common to UHF and outside UHF band
Q17	Reception RF amp	UHF
Q19	Drive amp	VHF 1st drive
Q20	Mixer	VHF
Q21	Reception RF amp	VHF
Q22	AGCSW	VHF reception amp
Q23	2x amp	800 MHz 1st local
Q24	Mixer	800 MHz
Q25,Q26	Reception RF amp	800 MHz (cascade connection)
Q27	AGCSW	Reception amp for outside of UHF band
Q28	SW	VHF mixer switch
Q29	Reception RF amp	Reception amp for outside of UHF band
Q30	Switch	VCO shift switch
Q31	Two 450 kHz amps	1st, 2nd AM amps
Q300	Switch	Lamp AVR
Q301	Buffer amp	APC differential amplifier output
Q302	Switch	APC circuit switch
Q303	SW	APC line switch

DESCRIPTION OF COMPONENTS

Ref. No.	Use/Function	operation/Condition/Compatibility
Q304	SW	APC line mute switch
Q305	SW	APC line discharge switch
Q306	SW	M3SW
Q308	SW	Reception audio mute switch
Q309	HPF	Reception audio
Q310	SW	Reception audio mute switch
Q312	AVR	Audio amp
Q313	SW	Audio amp AVR
Q314, Q315	AVR	C3
Q316	SW	RV36、RV43
Q317	SW	C3V、C3U
Q318	SW	RV80、RV14
Q319	SW	AMV、IFV
Q320	SW	TV14、TV43
Q321	Constant-current circuit	Battery charge
Q322	AVR	Lamp
Q323	SW	Reception audio mute switch
Q324	SW	Mute switch control line drive
Q325	AVR	Audio amp
Q326, Q327	AVR	Reception power supply (TV)
Q328	SW	Reception power supply (TV)AVRSW
Q329	Drive amp	UHF 1st drive
D1	Speed up	UHF ripple filter
D2	Speed up	VHF ripple filter
D3	RF SW	UHF drive
D4	RF SW	UHF 1st local
D5	RF SW	VHF drive
D6	RF SW	VHF 1st local
D7	Constant-voltage circuit	PLL charge pump
D8	RF SW	800 MHz 1st local
D9	Noise detection	Noise squelch
D10	Constant-voltage circuit	UHF drive
D11	ANT SW	UHF reception
D12	RF SW	UHF reception main, sub mixer input switching
D13	RF SW	UHF reception main, sub RF amp input switching
D14	RF SW	UHF, VHF fin amp output switching
D15	RF SW	UHF reception main, sub isolation
D16, D17	ANT SW	UHF reception
D18, D19	BPF tuning	UHF sub-reception
D20	Constant-voltage circuit	VHF drive
D21	ANT SW	VHF transmission
D22	ANT SW	VHF reception
D23~D25	BPF tuning	VHF reception
D26	ANT SW	VHF transmission
D220	AM detection	
D300	Constant voltage	Charge circuit






DESCRIPTION OF COMPONENTS

Ref. No.	Use/Function	operation/Condition/Compatibility
D301	Constant voltage	Lamp AVR
D319	Speed up	Reception audio mute switch
D320	Fixed voltage	Audio amp AVR
D321	Reverse current prevention	DC IN
D322	Constant voltage	Charge circuit
D323	PWM rectification	APC
D324	Reverse current prevention	M3 regulator
D325	Start up	Multiplier voltage circuit
D326	Constant voltage	Lamp AVR
D327	Voltage restriction	Power module protection
D501,D502	LED	LCD illumination
D503	2-color LED	TX/BUSY
D504~D509	LED	Key illumination
D510	Reverse current prevention	Key matrix
D511~D513	Reverse current prevention	Destination
D515,D516	Reverse current prevention	CH display mode
D517	Reverse current prevention	Destination
D518~D521	Reverse current prevention	Key matrix






SEMICONDUCTOR DATA

Microcomputer pin functions:UPD78054GK-XXX:IC301

■ Terminal function

Pin No.	I/O	Pin name	Active level	SAVE	Function
1	O	AFM1	H	L	Audio line switch H: ON, L: Mute
2	O	AFS	L	H	Audio amplifier power switch L: ON
3	I	SEL	L	I	Data line switching input L: RS-232C mode
4	-	AVSS	-	-	A/D converter circuit Vss pin → Connected to GND.
5	O	DTMF	-	L	DTMF signal D/A output pin
6	O	BPC	-	L	Band-pass tuning D/A output pin
7	-	AVREF1	-	-	D/A converter circuit reference voltage pin
8					
9	O	TxD	-	I/O	RS-232C TxD pin (Connected to REM pin.)
10	O	MICS	-	-	Internal/external microphone switching L: External, H: Internal
11	I	PTT2	L	I	External [PTT] key L: Pressed
12	O	TXL	L	H	Transmit LED (red) switch L: ON
13	O	BYL	L	H	Receive LED (green) switch L: ON
14	I/O	SDA		I	EEPROM data input/output line
15	O	TR	-	I	VCO shift switch L: VHF TX, H:UHF TX
16	O	LPS	H	L	Lamp switch H: ON
17	O	APCD	L	H	APC voltage discharge control line L: Transmit
18	O	ENP		L	PLL enable output pin
19	I	KYI0	L	I	Key matrix input port
20	I	KYI1	L	I	Key matrix input port
21	I	KYI2	L	I	Key matrix input port
22	I	KYI3	L	I	Key matrix input port
23	I	KYI4	L	I	Key matrix input port
24	I	TYPE	L	I	Destination input port
25	I	CHM	L	I	Channel display mode input port
26					
27	O	KYO0	L	I	Key matrix output port
28	O	KYO1	L	I	Key matrix output port
29	O	KYO2	L	I	Key matrix output port
30	O	KYO3	L	I	Key matrix output port
31	O	KYO4	L	I	Key matrix output port
32	O	M3SS	H	I	M3S switch (Power to components other than the microcomputer and EEPROM)
33	-	VSS	-	-	Microcomputer ground potential
34	O	ET		L	AK2343 strobe output pin
35					
36	O	LFS	H	-	High-speed scan loop filter switch H: High speed
37	O	LFVU	-	-	PLL loop filter V/U switching L: VHF, H:UHF
38	O	SAVE	L	H	Save power supply (C3 ON/OFF) L: ON
39	O	APCG	H	L	APC circuit power supply H: ON
40					
41	O	INH	-	H	LCD driver display off input L: OFF, H: ON
42	O	MODE	-	-	LCD driver data type L: Display data, H: Mode data
43	O	CE		-	LCD driver chip enable H: Enable
44	O	APC		L	APC PWM output pin

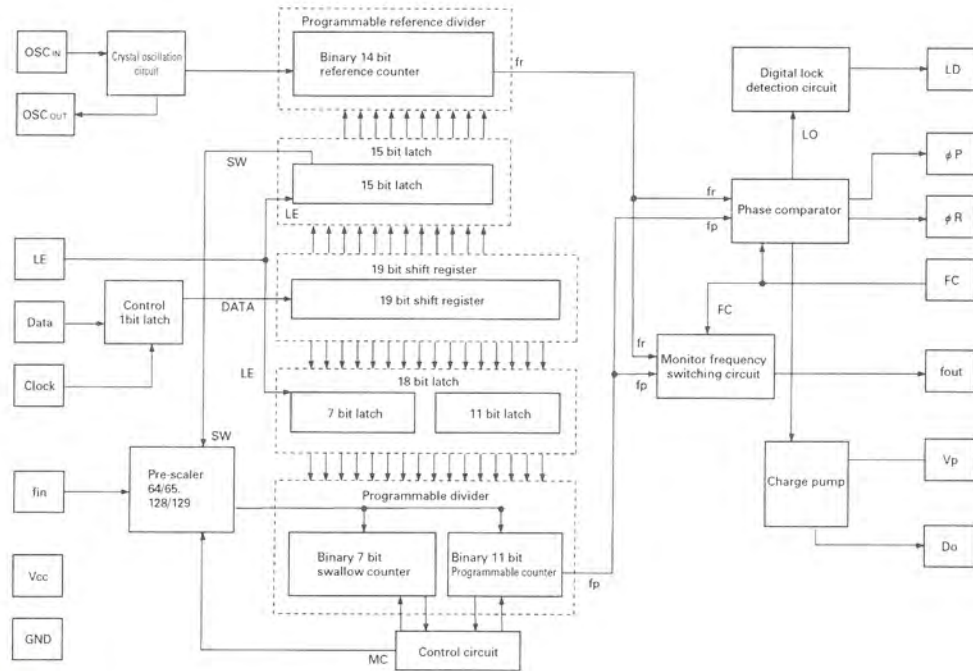
SEMICONDUCTOR DATA

Pin No.	I/O	Pin name	Active level	SAVE	Function
45					
46	O	BEEP		L	BEEP output pin, 1750Hz tone output pin
47	O	DP		L	Common data line
48	O	CP		L	Common clock line
49					
50	O	T14S	L	-	VHF transmitter power supply L:ON
51	O	T43S	L	-	UHF transmitter power supply L:ON
52	O	C3VS	L	-	VHF VCO power supply L:ON
53	O	C3US	L	-	UHF VCO power supply L:ON
54	O	R80S	L	-	800MHz band receiver circuit power supply L:ON
55	O	R14S	L	-	118MHz, 144MHz band receiver circuit power supply L:ON
56	O	AMVS	L	-	AM demodulation switch L:AM, H:FM
57	O	IFVS	L	H	IF power supply L:ON
58	O	R36S	L	-	300MHz band receiver circuit power supply L:ON
59	O	R43S	L	-	430MHz band receiver circuit power supply L:ON
60	I	RESET	L	-	External reset pin L:RESET
61	I	LD	H	I	PLL lock detect input pin H: Lock
62	I	INT	-	I	Power supply detection interrupt input H: Battery
63	I	PWR	L	I	Power switch interrupt input L: Pressed
64	I	EN1		I	Encoder interrupt input
65	I	EN2		I	Encoder data input
66	I	PTT	L	I	Internal [PTT] key L: Pressed
67	O	ISPS	H	-	Internal speaker forced output switch H:ON
68	-	VDD	-	-	Positive power pin
69	-	X2	-	-	System clock (4.19430MHz)
70	I	X1	-	-	System clock (4.19430MHz)
71	-	IC	-	-	Connected to Vss.
72	-	-	-	-	Disabled → Open
73	I	SDO	L	I	AK2343 tone detection input pin L: Detect
74	-	AVDD	-	-	A/D converter circuit power pin → Connected to V _{DD} .
75	-	AVREF0	-	-	A/D converter circuit reference voltage pin
76	I	SQL	-	I	Squelch noise voltage input
77	I	SM	-	I	S meter voltage input pin
78	I	REM	-	I	Remote control switch detection pin
79	I	THM	-	I	APC temperature detection input pin
80	I	BC	-	I	Power supply voltage detection pin (Battery meter)

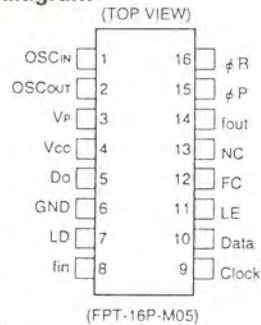
SEMICONDUCTOR DATA

PLL IC:MB15A01:IC2

■ Block diagram



■ Terminal connection diagram

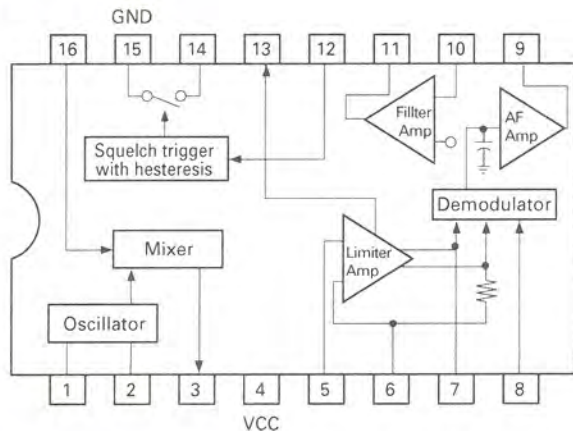


■ Circuit Configuration

Pin No.	Pin name	I/O	Function
1	OSC in	I	Crystal oscillator input and terminal for reference divider input (oscillator input).
2	OSC out	O	Crystal oscillator terminal (crystal oscillator output)
3	V _p	-	Power supply terminal for charger pump output. Connect to V _{cc} when not using internal charger pump.
4	V _{cc}	-	Power supply terminal
5	D _o	-	Not used
6	GND	-	GND
7	LD	O	Output for lock detection. At lock : LD="H" At unlock : LD="L"
8	fin	I	Prescaler input. Input by AC coupling.
9	Clock	I	Clock input for 19 bit shift register and 16 bit shift register. Data loads at clock pulse rise.
10	Data	I	Serial data input (by binary code). The final data bit is a control bit. At "H" the control bit sends data to 15 bit latch. At "L" sends data to 18 bit latch.
11	LE	I	Load enable signal input (with pull-up resistor). At "LE" = H shift register contents are sent to latch by combining with serial data control bit.
12	FC	-	Not used
13	NC	-	Not used
14	f out	-	Not used
15	ϕP	O	Output for charge pump with external phase comparator. This is N-ch open drain output.
16	ϕR	O	Output for charge pump with external phase comparator. This is C-MOS open drain output.

FM IC:MC3372SV:IC4

■ Block diagram



■ Terminal function

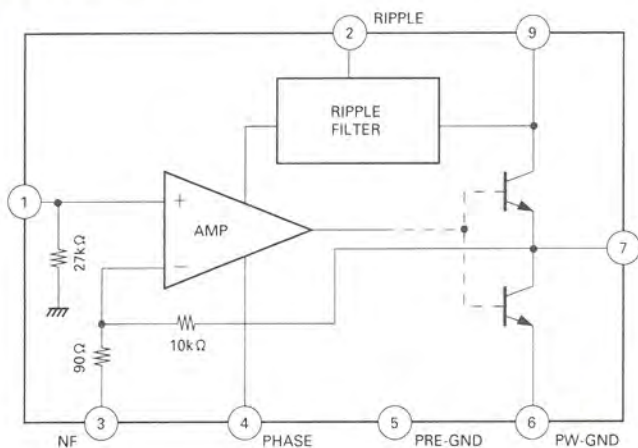
Pin No.	Pin name	Function
1	OSC In	Connect the crystal oscillator element to form a Colpitts type oscillator circuit.
2	OSC Out	When using an external oscillator provide the input to terminal No. ① and Vcc to terminal No. ②.
3	MIX Out	Mixer output.
4	V _{CC}	Power supply.
5	LIM In	This is the limiter amp input as well as coupling terminal (output terminal). Terminals No. ⑥ and ⑦ are the AC ground. (Or connect the feedback resistor and phase comparator capacitor to terminal No. ⑦.)
6	DEC1	
7	DEC2 (LIM Out)	

Pin No.	Pin name	Function
8	QUAD In	This is the phase comparator terminal.
9	AF Out	Outputs the detected FM signal.
10	FAmp.In	Inverter terminal for op amp.
11	FAmp.Out	Output terminal for op amp.
12	SQSW In	Input for squelch switch.
13	SMeter Out	Current is output according to limiter amp input signal level.
14	SQSW Out	Squelch circuit output.
15	GND	Ground.
16	MIX In	Mixer input.

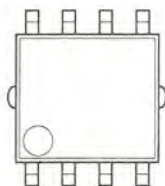
Note: The parts in the parentheses () explain the MC3372.

AF AMP IC:KIA6278F:IC312

■ Block diagram



■ Terminal connection diagram



■ Maximum ratings (Ta = 25°C)

Item	Symbol	Rating	Unit
Power supply voltage	V _{CC}	14	V
Power loss (comprehensive restrictions) Note 1	PD	900	mW
Operating temperature	T _{opr}	-25~75	°C
Storage temperature	T _{stg}	-55~150	°C

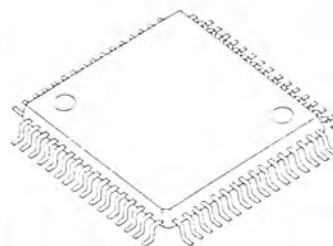
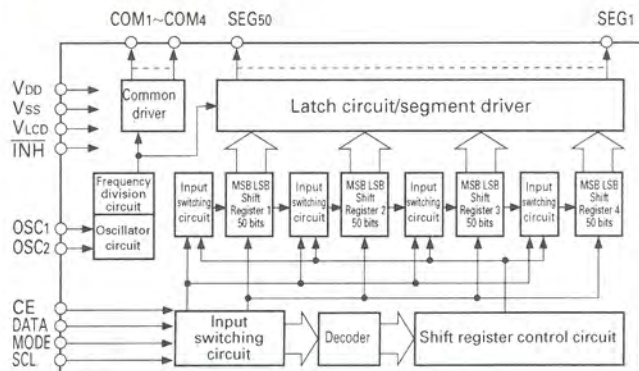
Note 1. If the temperature exceeds Ta = 25°C, the rated output drops 7.2mW per 1°C.

SEMICONDUCTOR DATA

LCD Driver : NJU6433F:IC500

External view

Block diagram



Terminal function

Pin No.	Pin name	Function
1~50	SEG ₁ ~SEG ₅₀	LCD drive segment output.
51	OSC ₁	CR oscillator element (with external resistor)
52	OSC ₂	
53	V _{DD}	Logic power supply
54	V _{SS}	Ground
55	V _{LCD}	Liquid crystal power supply.
56	CE	Chip enable signal input. At H level input : LCD display data, Mode set data input mode At pulse fall edge : LCD display data latch At L level input : Disable
57	SCL	Serial data transfer clock input Synchronize the LCD display data with the clock rise and set shift in.
58	DATA	Serial data transfer input. Data capture timing : Clock pulse rise
59	MODE	Mode set input Switches between mode set data and LCD display data. At H level input : Mode set data input. At L level input : LCD display data input.
60	INH	Display lamp off input At L level input : Display lamp off At H level input : Display lamp on Display data prior to display lamp off is retained.
61~64	COM ₄ ~COM ₁	LCD drive comon output.

PARTS LIST

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

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

TH-G71A/E

SWITCH UNIT (X41-342X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
TH-G71A/E					
1	1B	*	A02-2047-03	CABINET ASSY	
2	-	*	A02-2078-22	BATTERY CASE ASSY (BT-11) ACSY	M4
3	1A	*	B09-0361-03	CAP (MIC/SP)	
4	1B	*	B09-0362-03	CAP (DC-IN)	
5	1A	*	B10-1283-03	FRONT GLASS (LCD)	
6	3B	*	B42-3394-14	STANDARD LABEL (FCC)	K,K2
7	3B	*	B42-5650-04	S/NO LABEL	
8	-	*	B46-0310-03	WARRANTY CARD ACSY	T,E,E3
8	-	*	B46-0469-00	WARRANTY CARD ACSY	K,K2
9	-	*	B59-1308-00	PANFLET ACSY	K,K2
10	-	*	B62-0739-00	INSTRUCTION MANUAL (ENG) ACSY	K,K2,E,T
10	-	*	B62-0739-00	INSTRUCTION MANUAL (ENG) ACSY	M2,M3,M4
10	-	*	B62-0740-00	INSTRUCTION MANUAL (GERM) ACSY	E,E3
10	-	*	B62-0741-00	INSTRUCTION MANUAL (SPE) ACSY	K,K2,E3
10	-	*	B62-0741-00	INSTRUCTION MANUAL (SPE) ACSY	M2,M3,M4
10	-	*	B62-0742-00	INSTRUCTION MANUAL (NTHA) ACSY	E3
10	-	*	B62-0743-00	INSTRUCTION MANUAL (FREN) ACSY	E3
10	-	*	B62-0791-00	INSTRUCTION MANUAL (CHINA) ACSY	M2,M3,M4
10	-	*	B62-0877-00	INSTRUCTION MANUAL (ITA) ACSY	E
11	3A	*	B72-1185-04	MODEL NAME PLATE (FCC)	K,K2
11	3A	*	B72-1186-04	MODEL NAME PLATE	M2,M3,M4
11	3A	*	B72-1187-04	MODEL NAME PLATE	T,E,E3
12	3A	*	E04-0407-05	RF COAXIAL RECEPTACLE (SMA)	
13	-	*	E19-0254-05	AC CONVERSION PLUG ACSY	M2,M3
14	3B	*	E23-1042-14	TERMINAL (BATTERY)	
15	3A	*	E23-1061-04	GROUND TERMINAL (P MODULE)	
16	2B	*	E37-0681-05	FLAT CABLE	
17	2A	*	F10-2237-13	SHIELDING COVER (RF)	
18	3A	*	F10-2251-04	SHIELDING COVER (VHF)	
19	2B	*	F20-1185-04	INSULATING SHEET (PTT)	
20	2A	*	F20-1186-04	INSULATING SHEET (SHIELD PLATE)	
21	2B	*	G02-0813-14	EARTH SPRING	
22	3A	*	G13-1614-04	CUSHION (BATTERY)	
23	3A	*	G53-0815-02	PACKING (CASE)	
24	1A	*	G53-0818-04	PACKING (SMA)	
25	2A	*	G53-0819-03	PACKING (SP/MIC)	
26	-	*	H12-3011-01	PACKING FIXTURE	
27	-	*	H12-3012-01	PACKING FIXTURE	K,K2,T,E
27	-	*	H12-3012-01	PACKING FIXTURE	E3,M2,M3
28	-	*	H13-1004-04	CARTON BOARD	K,K2,T
29	-	*	H25-0085-04	PROTECTION BAG (100/200/0.07)	
30	-	*	H52-1042-02	ITEM CARTON CASE	K,K2
30	-	*	H52-1043-02	ITEM CARTON CASE	T,E,E3
30	-	*	H52-1044-02	ITEM CARTON CASE	M4
30	-	*	H52-1075-02	ITEM CARTON CASE	M2,M3
31	3B	*	J19-1599-03	HOLDER	
32	2B	*	J21-8325-04	HARDWARE FIXTURE (PTT)	
33	-	*	J29-0631-13	HOOK ACSY	
34	-	*	J69-0339-05	HANDSTRAP ACSY	
35	2A	*	J82-0043-05	FPC (VOL/ENC)	
36	2B	*	K29-5149-02	KNOB (PTT)	
37	1A	*	K29-5150-03	KNOB (VOL)	
38	1B	*	K29-5151-02	KEY TOP	

Ref. No.	Address	New parts	Parts No.	Description	Destination
39	1A	*	K29-5159-03	KNOB (ENC)	
40	1A	*	N14-0569-04	CIRCULAR NUT (VOL/ENC)	
A	3A	*	N30-2605-46	PAN HEAD MACHINE SCREW	
B	2A,2B	*	N79-2040-46	PAN HEAD TAPTITE SCREW	
C	3B	*	N80-2010-45	PAN HEAD TAPTITE SCREW	
D	3A	*	N80-2012-46	PAN HEAD TAPTITE SCREW	
E	2B,3A	*	N83-2005-46	PAN HEAD TAPTITE SCREW	
VR	2A	*	R39-0602-05	VARIABLE RESISTOR (VOL/ENC)	
SP	1A	*	T07-0341-05	SPEAKER	
ANT	-	*	T90-0634-05	WHIP ANTENNA	
D100	-	*	ERB83-004	DIODE(BATT CASE:BT-11)	M3
IC100	3A	*	M67798LRA	IC(POWER MODULE:VHF)	
IC101	3A	*	M67799MA	IC(POWER MODULE:UHF)	
41	-	*	W08-0437-05	CHARGER (AC 120V) ACSY	K,K2
41	-	*	W08-0438-15	CHARGER (AC 230V) ACSY	T
41	-	*	W08-0440-05	CHARGER (AC 230V) ACSY	E,E3
41	-	*	W08-0441-05	CHARGER (AC 120/230V) ACSY	M2,M3
42	-	*	W09-0909-05	BATTERY ASSY(6V 650mAh) ACSY	K2,T,E2
42	-	*	W09-0909-05	BATTERY ASSY(6V 650mAh) ACSY	E3,M2
42	-	*	W09-0911-05	BATTERY ASSY(9.6V 600mAh) ACSY	K,M3
SWITCHUNIT (X41-342X-XX) 0-11:K,K2 0-21:M2,M3,M4 2-71:T,E,E3					
101	2A	*	B11-1173-04	REFLECTOR(LCD)	
LCD	2A	*	B38-0780-05	LCD	
D501,502	-	*	B30-2143-05	LED (YG)	
D503	-	*	B30-2131-05	LED	
D504-509	-	*	B30-2157-05	LED (YELLOW)	
C500	-	*	CK73GB1H471K	CHIP C 470PF K	
C501	-	*	CK73GB1H102K	CHIP C 1000PF K	
C502,503	-	*	CK73GB1H103K	CHIP C 0.010UF K	
102	2A	*	E29-1164-04	INTER CONNECTOR (LCD)	
CN501,502	-	*	E23-1060-04	TERMINAL (SPI)	
CN506	-	*	E40-5630-05	PIN ASSY SOCKET	
CN507	-	*	E40-5629-05	PIN ASSY	
CN508	-	*	E40-5902-05	FLAT CABLE CONNECTOR (36P)	
CN509	-	*	E40-5915-05	FLAT CABLE CONNECTOR (6P)	
W500	-	*	E37-0697-05	PROCESSED LEAD WIRE	
103	2A	*	F10-2239-04	SHIELDING PLATE	
104	2A	*	F20-1191-04	SHIELDING SHEET	
-	-	*	G13-1648-04	CUSHION (LCD)	
105	2A	*	J21-8317-04	HARDWARE FIXTURE (LCD)	
L502,503	-	*	L92-0140-05	FERRITE CHIP	
CP501	-	*	R90-0724-05	MULTI-COMP 1K X4	
CP502,503	-	*	R90-1016-05	MULTIPLE RESISTOR 470Kx4	
CP505	-	*	R90-0737-05	MULTIPLE RESISTOR 100Kx2	
CP506	-	*	R90-0724-05	MULTI-COMP 1K X4	
R500	-	*	RK73FB2A151J	CHIP R 150 J 1/10W	
R501	-	*	RK73FB2A471J	CHIP R 470 J 1/10W	
R502	-	*	RK73GB1J471J	CHIP R 470 J 1/16W	
R503	-	*	RK73GB1J102J	CHIP R 1.0K J 1/16W	

PARTS LIST

SWITCH UNIT (X41-342X-XX)

TX-RX UNIT (X57-5410-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R504			RK73GB1J471J	CHIP R 470 J 1/16W		C43			CK73HB1H471K	CHIP C 470PF K	
R507			RK73GB1J471J	CHIP R 470 J 1/16W		C44			CC73HCH1H010C	CHIP C 1 0PF C	
R508			RK73FB2A181J	CHIP R 180 J 1/10W		C45			CC73HCH1H070D	CHIP C 7PF D	
R509,510			RK73GB1J471J	CHIP R 470 J 1/16W		C46			CC73HCH1H060D	CHIP C 6.0PF D	
R512			RK73GB1J101J	CHIP R 100 J 1/16W		C50			CK73GB1H102K	CHIP C 1000PF K	
R513			R92-1252-05	CHIP R 0 OHM		C51			CC73GCH1H270J	CHIP C 27PF J	
R514			RK73GB1J154J	CHIP R 150K J 1/16W		C52			CK73HB1H471K	CHIP C 470PF K	
R516,517			RK73GB1J474J	CHIP R 470K J 1/16W		C53			CK73GB1C104K	CHIP C 0.10UF K	
R518			RK73FB2A151J	CHIP R 150 J 1/10W		C55			CC73HCH1H030C	CHIP C 3.0PF C	
R519			RK73GB1J103J	CHIP R 10K J 1/16W		C56			CC73HCH1H020C	CHIP C 2.0PF C	
R520			R92-1252-05	CHIP R 0 OHM		C57			CC73HCH1H030C	CHIP C 3.0PF C	
S501		*	S70-0460-05	TACT SWITCH		C70			CC73HCH1H070D	CHIP C 7.0PF D	
MIC	2B	*	T91-0580-05	MIC ELEMENT		C71, 72			CK73HB1H471K	CHIP C 470PF K	
D510			MA2S111	DIODE		C73			CC73HCH1H150J	CHIP C 15PF J	K,K2
D511			MA2S111	DIODE	K,K2	C73			CK73HB1H471K	CHIP C 470P K	M2,M3,M4,E3
D512			MA2S111	DIODE	M2,M3,M4	C74			CC73HCH1H180J	CHIP C 18PF J	
D513			MA2S111	DIODE	K,K2	C75			CK73HB1H471K	CHIP C 470PF K	
D513			MA2S111	DIODE	T,E,E3	C76			C92-0565-05	CHIP-TAN 6.8UF 10WV	
D515-521			MA2S111	DIODE		C77			CK73HB1H471K	CHIP C 470PF K	
IC500		*	NJU6433F	IC(200BIT LCD DRIVER)		C78			CK73HB1C103K	CHIP C 0.010UF K	
TX-RX UNIT (X57-5410-XX)-11:K,K2 -21:T,E,E3,M2,M3,M4											
C1,2			CK73HB1H471K	CHIP C 470PF K		C86			CK73HB1C103K	CHIP C 0.010UF K	
C3			C92-0544-05	CHIP-TAN 10UF 4WV		C87			CK73HB1H471K	CHIP C 470PF K	
C4			CK73HB1H102K	CHIP C 1000PF K		C88			CC73HCH1H030C	CHIP C 3.0PF C	
C5			C92-0647-05	CHIP TAN 3.3UF 4WV		C90			CK73HB1H471K	CHIP C 470PF K	
C6			CK73HB1H102K	CHIP C 1000PF K		C91			CC73HCH1H070D	CHIP C 7.0PF D	
C7			CK73HB1C103K	CHIP C 0.010UF K		C92-94			CK73HB1H471K	CHIP C 470PF K	
C8,9			CK73HB1H471K	CHIP C 470PF K		C96			CK73HB1H471K	CHIP C 470PF K	
C10			CC73HCH1H180J	CHIP C 18PF J		C97			CC73HCH1H390J	CHIP C 39PF J	
C11,12			CK73HB1H471K	CHIP C 470PF K		C98			CC73HCH1H220J	CHIP C 22PF J	
C13			CK73HB1H102K	CHIP C 1000PF K		C99			CC73GCH1H030C	CHIP C 3.0PF C	
C14,15			CK73HB1H471K	CHIP C 470PF K		C100			CC73GCH1H050C	CHIP C 5.0PF C	
C16			CK73HB1H102K	CHIP C 1000PF K		C101			CC73GCH1H010C	CHIP C 1.0PF C	
C17			CK73HB1H471K	CHIP C 470PF K		C102			CK73GB1C104K	CHIP C 0.10UF K	
C18			CC73HCH1H150J	CHIP C 15PF J		C103			CK73HB1H471K	CHIP C 470PF K	
C19			CC73HCH1H220J	CHIP C 22PF J		C104			CC73HCH1H010C	CHIP C 1.0PF C	
C20,21			CK73HB1H102K	CHIP C 1000PF K		C105			CC73HCH1H070D	CHIP C 7.0PF D	
C22			CC73HCH1H030C	CHIP C 3.0PF C		C106			CK73HB1H471K	CHIP C 470PF K	
C23			CK73HB1H102K	CHIP C 1000PF K		C107,108			CC73HCH1H270J	CHIP C 27PF J	
C24			CC73HCH1H060D	CHIP C 6.0PF D		C109			CK73HB1H471K	CHIP C 470PF K	
C25			CC73GCH1H010C	CHIP C 1.0PF C		C110			CC73HCH1H070D	CHIP C 7.0PF D	
C26			CC73HCH1H060D	CHIP C 6.0PF D		C111			CK73HB1H471K	CHIP C 470PF K	
C27,28			CK73HB1H102K	CHIP C 1000PF K		C112			CC73HCH1H070D	CHIP C 7.0PF D	
C29			CC73HCH1H050C	CHIP C 5.0PF C		C113			CC73HCH1H390J	CHIP C 39PF J	
C31			CC73HCH1H050C	CHIP C 5.0PF C		C114			CK73HB1H471K	CHIP C 470PF K	
C32			CC73HCH1H120J	CHIP C 12PF J		C116			CC73HCH1H330J	CHIP C 33PF J	
C33			CK73HB1H471K	CHIP C 470PF K		C117			CC73HCH1H060D	CHIP C 6.0PF D	
C34			CK73HB1C103K	CHIP C 0.010UF K		C118			CC73HCH1H470J	CHIP C 47PF J	
C35			CK73HB1H471K	CHIP C 470PF K		C119			CC73HCH1H120J	CHIP C 12PF J	
C36			CK73GB1C104K	CHIP C 0.10UF K		C120			CC73HCH1H180J	CHIP C 18PF J	
C37			CK73HB1H471K	CHIP C 470PF K		C121			CC73HCH1H330J	CHIP C 33PF J	
C38			CK73GB1C104K	CHIP C 0.10UF K		C122			CK73HB1H102K	CHIP C 1000PF K	
C39			C92-0655-05	CHIP-TAN 4.7UF 6.3WV		C123			CC73HCH1H080D	CHIP C 8.0PF D	
C40			C92-0542-05	CHIP-TAN 0.10UF 20WV		C124,125			CK73HB1H102K	CHIP C 1000PF K	
C41,42			CK73HB1C103K	CHIP C 0.010UF K		C126			CC73HCH1H330J	CHIP C 33PF J	
						C127			CK73HB1H102K	CHIP C 1000PF K	

PARTS LIST

TX-RX UNIT (X57-5410-XX)

Ref.No.	Address	New parts	PartsNo.	Description	Destination	Ref.No.	Address	New parts	PartsNo.	Description	Destination
C128			C92-0507-05	CHIP-TAN 4 7UF 6.3WV		C208			CK73FB1A105K	CHIP C 1.0UF K	
C129			CK73HB1C103K	CHIP C 0.010UF K		C209			CK73HB1C103K	CHIP C 0.010UF K	
C130			CK73HB1H102K	CHIP C 1000PF K		C210			CK73HB1H471K	CHIP C 470PF K	
C131			CK73FB1A105K	CHIP C 1.0UF K		C211			CC73HCH1H101J	CHIP C 100PF J	
C132			CK73HB1C103K	CHIP C 0.010UF K		C214			CC73HCH1H040C	CHIP C 4.0PF C	
C133			CK73HB1H102K	CHIP C 1000PF K		C215			CK73HB1C103K	CHIP C 0.010UF K	
C134			CC73GCH1H020C	CHIP C 2.0PF C		C216			CC73HCH1H1R5C	CHIP C 1.5PF C	
C135			CC73GCH1H090D	CHIP C 9.0PF D		C217			CC73HCH1H020C	CHIP C 2.0PF C	
C136			CK73GB1H102K	CHIP C 1000PF K		C218			CC73HCH1H470J	CHIP C 47PF J	
C137			CC73GCH1H270J	CHIP C 27PF J		C219			CC73HCH1H101J	CHIP C 100PF J	
C138			CC73GCH1H060D	CHIP C 6.0PF D		C220			CC73HCH1H470J	CHIP C 47PF J	
C139			CC73GCH1H180J	CHIP C 18PF J		C221			CC73HCH1H030C	CHIP C 3.0PF C	
C140-142			CK73HB1C103K	CHIP C 0.010UF K		C222			CK73HB1H471K	CHIP C 470PF K	
C144			CC73HCH1H060D	CHIP C 6.0PF D		C223			CK73HB1C103K	CHIP C 0.010UF K	
C145			CK73HB1C103K	CHIP C 0.010UF K		C224			CC73HCH1H030C	CHIP C 3.0PF C	
C147,148			CK73HB1C103K	CHIP C 0.010UF K		C226			CC73HCH1H0R5C	CHIP C 0.5PF C	
C149			CC73HCH1H220J	CHIP C 22PF J		C227			CC73HCH1H220J	CHIP C 22PF J	
C150			CK73GB1C104K	CHIP C 0.10UF K		C228			CK73GB1C104K	CHIP C 0.10UF K	
C151			CC73HCH1H050C	CHIP C 5.0PF C		C229,230			CK73HB1H471K	CHIP C 470PF K	
C152			CK73HB1H102K	CHIP C 1000PF K		C231			CK73HB1H102K	CHIP C 1000PF K	
C153-155			CK73GB1C104K	CHIP C 0.10UF K		C232-234			CC73HCH1H101J	CHIP C 100PF J	M2,M3,M4,T,E,E3
C156			CK73HB1H102K	CHIP C 1000PF K		C235			CC73GCH1H060D	CHIP C 6P D	M2,M3,M4,T,E,E3
C157			CK73GB1C104K	CHIP C 0.10UF K		C236			CC73GCH1H070D	CHIP C 7P D	M2,M3,M4,T,E,E3
C159			CK73FB1E104K	CHIP C 0.10UF K		C300			CK73EF1A106Z	CHIP C 10UF 10WV	
C160			CK73HB1H102K	CHIP C 1000PF K		C301-303			CK73HB1H102K	CHIP C 1000PF K	
C161			CK73GB1C104K	CHIP C 0.10UF K		C304			CK73GB1H392K	CHIP C 3900PF K	
C162,163			CK73HB1C103K	CHIP C 0.010UF K		C305			CK73HB1C103K	CHIP C 0.010UF K	
C165,166			CK73HB1H471K	CHIP C 470PF K		C306			CK73GB1H471K	CHIP C 470PF K	
C167			CC73HCH1H180J	CHIP C 18PF J		C307,308			CK73HB1H471K	CHIP C 470PF K	
C168			CK73HB1H102K	CHIP C 1000PF K		C309			CK73GB1E223K	CHIP C 0.022UF K	
C169			CK73GB1C104K	CHIP C 0.10UF K		C310			CK73HB1H102K	CHIP C 1000PF K	
C170			CK73GB1C333K	CHIP C 0.033UF K		C311			CK73FB1H102K	CHIP C 1000PF K	
C171			CK73FB1E473K	CHIP C 0.047UF K		C312			C92-0587-05	CHIP-TAN 2.2UF 4WV	
C172			CK73GB1C104K	CHIP C 0.10UF K		C313,314			CK73GB1C104K	CHIP C 0.10UF K	
C173			CK73HB1H471K	CHIP C 470PF K		C315,316			CK73GB1C223K	CHIP C 0.022UF K	
C174			CC73HCH1H820J	CHIP C 82PF J		C317			CK73GB1C104K	CHIP C 0.10UF K	
C175			CK73GB1C104K	CHIP C 0.10UF K		C318			C92-0633-05	CHIP-TAN 22UF 10WV	
C176			C92-0623-05	CHIP-TAN 22UF 4WV		C319			CK73GB1C104K	CHIP C 0.10UF K	
C177			CK73GB1C104K	CHIP C 0.10UF K		C320-322			CK73GB1C473K	CHIP C 0.047UF K	
C178			CC73HCH1H0R5C	CHIP C 0.5PF C		C323			C92-0628-05	CHIP-TAN 10UF 10WV	
C179			CC73HCH1H220J	CHIP C 22PF J		C324			CK73EF1A106Z	CHIP C 10UF Z	
C180			CK73HB1C103K	CHIP C 0.010UF K		C325			CK73HB1H471K	CHIP C 470PF K	
C181			CC73HCH1H050C	CHIP C 5.0PF C		C326			CK73FB1A105K	CHIP C 1.0UF K	
C182			CK73HB1H102K	CHIP C 1000PF K		C327			CK73HB1H471K	CHIP C 470PF K	
C184			CC73HCH1H270J	CHIP C 27PF J		C328			C92-0647-05	CHIP-TAN 3.3UF 4WV	
C185			CK73GB1C104K	CHIP C 0.10UF K		C329			CK73HB1H102K	CHIP C 1000PF K	
C186,187			CK73HB1H102K	CHIP C 1000PF K		C330			CK73HB1H471K	CHIP C 470PF K	
C188			CK73GB1C104K	CHIP C 0.10UF K		C331			CK73GB1H471K	CHIP C 470PF K	
C189-191			CK73HB1H102K	CHIP C 1000PF K		C332,333			C92-0605-05	CHIP-TAN 150UF 6.3WV	
C192			CK73GB1C104K	CHIP C 0.10UF K		C334			CK73GB1C473K	CHIP C 0.047UF K	
C193			CC73HCH1H270J	CHIP C 27PF J		C335			CC73HCH1H101J	CHIP C 100PF J	
C194-196			CK73HB1H102K	CHIP C 1000PF K		C336,337			CK73GB1C104K	CHIP C 0.10UF K	
C197			CC73HCH1H270J	CHIP C 27PF J		C338			C92-0594-05	CHIP-TAN 4.7UF 4WV	
C199			CC73HCH1H390J	CHIP C 39PF J		C339			CK73HB1H102K	CHIP C 1000PF K	
C200			CC73HCH1H330J	CHIP C 33PF J		C340,341			CK73HB1H471K	CHIP C 470PF K	
C201			CC73HCH1H390J	CHIP C 39PF J		C342			CK73HB1C103K	CHIP C 0.010UF K	
C202,203			CC73HCH1H060D	CHIP C 6PF D		C343			CK73GB1C104K	CHIP C 0.10UF K	
C205			CC73HCH1H101J	CHIP C 100PF J		C344			CK73HB1H102K	CHIP C 1000PF K	
C206			CK73GB1C104K	CHIP C 0.10UF K		C345			CK73GB1H471K	CHIP C 470PF K	
C207			CC73HCH1H101J	CHIP C 100PF J		C346-352			CK73HB1H471K	CHIP C 470PF K	

PARTS LIST

TX-RX UNIT (X57-5410-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C353			C90-4017-05	ELECTRO 470UF 4WV		CN1	2A	*	E23-1059-04	TERMINAL	
C354-356			CK73HB1H471K	CHIP C 470PF K		CN301		*	E40-5902-05	FLAT CABLE CONNECTOR(LCD)	
C357			CK73GB1C104K	CHIP C 0.10UF K		CN302		*	E40-5907-05	PIN ASSY SOCKET(20P)	
C358,359			CK73HB1H471K	CHIP C 470PF K		CN303		*	E40-5906-05	PIN ASSY (20P)	
C360-362			C92-0651-05	CHIP-TAN 6.8UF 10WV		J301			E11-0467-05	3.5D PHONE JACK(5P)	
C363,364			CK73HB1H471K	CHIP C 470PF K		J302			E11-0439-05	2.5D PHONE JACK(5P)	
C365		*	CC73HCH1H101J	CHIP C 100PF J		J303			E03-0170-05	DC JACK	
C366			CK73HB1C103K	CHIP C 0.010UF K		201	2B	*	F20-1181-04	INSULATING SHEET(VCO)	
C367,368			CK73HB1H471K	CHIP C 470PF K		F1			F53-0128-05	FUSE(0.5A 50V)	
C369			CK73HB1H102K	CHIP C 1000PF K		202	2B	*	G13-1630-14	CUSHION (10/10/1.5 CONT)	
C370			CK73GB1C104K	CHIP C 0.10UF K		CD1		*	L79-1474-05	TUNING COIL (450KHZ)	
C371-373			CK73HB1H471K	CHIP C 470PF K		CF1		*	L72-0945-05	CERAMIC FILTER(450KHZ)	
C374-377			CK73HB1H102K	CHIP C 1000PF K		L1			L92-0140-05	FERRITE CHIP	
C378,379			CK73HB1H471K	CHIP C 470PF K		L2			L40-2275-36	SMALL FIXED INDUCTOR(22NH)	
C380			CK73GB1H103K	CHIP C 0.010UF K		L3		*	L40-6875-36	SMALL FIXED INDUCTOR(68NH)	
C381			CK73GB1H102K	CHIP C 1000P K		L4			L40-2275-36	SMALL FIXED INDUCTOR(22NH)	
C382			CK73GB1C103K	CHIP C 0.010UF K		L6			L92-0140-05	FERRITE CHIP	
C383,384			CK73HB1H102K	CHIP C 1000PF K		L7			L34-1264-05	AIR-CORE COIL(2.5T)	
C385,386			CK73HB1C103K	CHIP C 0.010UF K		L8			L79-1101-15	FILTER MODULE	
C388			CK73GB1C104K	CHIP C 0.10UF K		L9			L92-0140-05	FERRITE CHIP	
C389			CK73HB1H471K	CHIP C 470PF K		L11,12			L40-5668-53	SMALL FIXED INDUCTOR(5.6NH)	
C390			CC73HCH1H150J	CHIP C 15PF J		L14		*	L40-6875-36	SMALL FIXED INDUCTOR(68NH)	
C391			CK73HB1H471K	CHIP C 470PF K		L16			L92-0140-05	FERRITE CHIP	
C392			CK73HB1H182K	CHIP C 1800PF K		L17		*	L40-2275-54	SMALL FIXED INDUCTOR(22NH)	
C393			CK73FB1A105K	CHIP C 1.0UF K		L18			L40-2275-36	SMALL FIXED INDUCTOR(22NH)	
C394			CK73GB1C104K	CHIP C 0.10UF K		L19,20		*	L34-4515-05	AIR-CORE COIL	
C395			CK73HB1H471K	CHIP C 470PF K		L21		*	L40-1275-54	SMALL FIXED INDUCTOR(12NH)	
C396			CK73FB1A105K	CHIP C 1.0UF K		L22		*	L40-2275-54	SMALL FIXED INDUCTOR(22NH)	
C398			C92-0647-05	CHIP-TAN 3.3UF 4WV		L23		*	L79-1492-05	FILTER MODULE (435MHZ)	
C399			C92-0587-05	CHIP-TAN 2.2UF 4WV		L23		*	L79-1492-05	FILTER MODULE (435MHZ)	
C400,401			CK73FB1A105K	CHIP C 1.0UF K		L23		*	L79-1493-05	FILTER MODULE(445MHZ)	
C402			CK73HB1H471K	CHIP C 470PF K		L24		*	L40-1575-36	SMALL FIXED INDUCTOR(15NH)	
C403-405			CK73HB1H102K	CHIP C 1000PF K		L25,26		*	L40-5675-54	SMALL FIXED INDUCTOR(56NH)	
C406,407		*	CC73HCH1H101J	CHIP C 100PF J		L28,29		*	L40-2275-54	SMALL FIXED INDUCTOR(22NH)	
C408			CK73HB1H102K	CHIP C 1000PF J		L30,31		*	L40-2275-36	SMALL FIXED INDUCTOR(22NH)	
C410,411			CK73HB1H471K	CHIP C 470PF K		L32		*	L40-6875-54	SMALL FIXED INDUCTOR(68NH)	
C412			CK73GB1C104K	CHIP C 0.10UF K		L33		*	L40-6875-36	SMALL FIXED INDUCTOR(68NH)	
C413			CK73FB1A105K	CHIP C 1.0UF K		L35			L92-0140-05	FERRITE CHIP	
C414			C92-0594-05	CHIP-TAN 4.7UF 4WV		L36			L33-1290-05	SMALL FIXED INDUCTOR	
C415,416			CK73HB1H471K	CHIP C 470PF K		L37,38			L34-1333-05	AIR-CORE COIL(8.5T)	
C417			CK73GB1C104K	CHIP C 0.10UF K		L39,40		*	L34-4506-05	COIL	
C419			CK73HB1H471K	CHIP C 470PF K		L41		*	L34-4507-05	COIL	
C433-437			CK73HB1H471K	CHIP C 470PF K		L42		*	L40-1085-54	SMALL FIXED INDUCTOR(100NH)	
C438			CK73GB1C104K	CHIP C 0.10UF K		L44		*	L40-1075-36	SMALL FIXED INDUCTOR(10NH)	
C439			CK73FB1A105K	CHIP C 1.0UF K		L45		*	L40-8265-69	SMALL FIXED INDUCTOR(8.2NH)	
C440			CK73GB1C104K	CHIP C 0.10UF K		L46		*	L33-1301-05	SMALL FIXED INDUCTOR(4.7NH)	
C441,442			CK73HB1H471K	CHIP C 470PF K		L47		*	L40-5668-52	SMALL FIXED INDUCTOR(5.6NH)	
C443			C92-0647-05	CHIP-TAN 3.3UF 4WV		L48		*	L40-5681-37	SMALL FIXED INDUCTOR(0.560UH)	
C444-448			CK73HB1H471K	CHIP C 470PF K		L50		*	L40-5681-37	SMALL FIXED INDUCTOR(0.560UH)	
C449			CC73HCH1H050C	CHIP C 5.0PF C	K,K2	L51		*	L92-0140-05	FERRITE CHIP	
C450			CC73HCH1H060D	CHIP C 6.0PF D		L52		*	L33-1290-05	SMALL FIXED INDUCTOR	
C451			CK73HB1H471K	CHIP C 470PF K		L53		*	L40-2775-54	SMALL FIXED INDUCTOR(27NH)	
C452			C92-0651-05	CHIP-TAN 6.8UF 10WV		L54		*	L40-1575-36	SMALL FIXED INDUCTOR(15NH)	
C453			CK73HB1H102K	CHIP C 1000PF K		L55		*	L40-1095-68	SMALL FIXED INDUCTOR(1UH)	
C454			CC73HCH1H270J	CHIP C 27PF J		L56		*	L40-1078-53	SMALL FIXED INDUCTOR(10NH)	
C456			CC73HCH1H100D	CHIP C 10PF D		L57		*	L40-2775-36	SMALL FIXED INDUCTOR(27NH)	
C457,458			CK73GB1H103K	CHIP C 0.010UF K		L58		*	L40-2275-36	SMALL FIXED INDUCTOR(22NH)	
TC1			C05-0384-05	CERAMIC TRIMMER CAP(10P)		L60,61		*	L40-6875-54	SMALL FIXED INDUCTOR(68NH)	

T,E,E3
M2,M3,M4

K,K2

PARTS LIST

TX-RX UNIT (X57-5410-XX)

Ref.No.	Address	New parts	PartsNo.	Description	Destination	Ref.No.	Address	New parts	PartsNo.	Description	Destination
L62		*	L40-1281-36	SMALL FIXED INDUCTOR(0.12UH)		R53			RK73HB1J561J	CHIP R	560 J 1/16W
L63			L40-5681-37	SMALL FIXED INDUCTOR(0.560UH)		R54			RK73HB1J180J	CHIP R	18 J 1/16W
L64			L33-1290-05	SMALL FIXED INDUCTOR		R55			RK73HB1J101J	CHIP R	100 J 1/16W
L65			L40-3975-54	SMALL FIXED INDUCTOR(39NH)		R56			R92-1368-05	CHIP R	0 OHM
L66		*	L40-3375-54	SMALL FIXED INDUCTOR(33NH)		R57			RK73HB1J680J	CHIP R	68 J 1/16W
L301			L92-0140-05	FERRITE CHIP		R58_59			RK73HB1J332J	CHIP R	3.3K J 1/16W
L303			L92-0140-05	FERRITE CHIP		R60			RK73HB1J470J	CHIP R	47 J 1/16W
L304			L33-0737-05	SMALL FIXED INDUCTOR		R61			RK73HB1J222J	CHIP R	2.2K J 1/16W
L305			L92-0137-05	FERRITE CHIP		R62			RK73HB1J221J	CHIP R	220 J 1/16W
L306			L40-1875-36	SMALL FIXED INDUCTOR(18NH)		R63			RK73HB1J224J	CHIP R	220K J 1/16W
L307			L40-2275-36	SMALL FIXED INDUCTOR(22NH)		R64			RK73HB1J104J	CHIP R	100K J 1/16W
L308_309			L40-1875-36	SMALL FIXED INDUCTOR(18NH)		R65			RK73HB1J222J	CHIP R	2.2K J 1/16W
L310			L40-5681-37	SMALL FIXED INDUCTOR(0.56UH)		R66			RK73HB1J153J	CHIP R	15K J 1/16W
L311			L40-1875-36	SMALL FIXED INDUCTOR(18NH)		R67			RK73HB1J332J	CHIP R	3.3K J 1/16W
L312			L92-0140-05	FERRITE CHIP		R68_69			RK73HB1J104J	CHIP R	100K J 1/16W
X1			L77-1663-05	CRYSTAL RESONATOR(12.8MHZ)		R70			RK73HB1J470J	CHIP R	47 J 1/16W
X301			L78-0367-05	RESONATOR (4.19MHZ)		R71			RK73HB1J224J	CHIP R	220K J 1/16W
XF1			L71-0481-05	MCF (38SC15B)		R72			RK73HB1J222J	CHIP R	2.2K J 1/16W
CP1		*	R90-0745-05	MULTIPLE RESISTOR 470Kx2		R73			RK73HB1J472J	CHIP R	4.7K J 1/16W
CP2_9			R90-0741-05	MULTIPLE RESISTOR 1K x2		R74			RK73HB1J104J	CHIP R	100K J 1/16W
R3_4			RK73HB1J332J	CHIP R 3.3K J 1/16W		R75			RK73HB1J222J	CHIP R	2.2K J 1/16W
R5			RK73HB1J563J	CHIP R 56K J 1/16W		R80			RK73HB1J151J	CHIP R	150 J 1/16W
R6			RK73HB1J221J	CHIP R 220 J 1/16W		R81			RK73HB1J182J	CHIP R	1.8K J 1/16W
R7			RK73HB1J220J	CHIP R 22 J 1/16W		R82			RK73HB1J270J	CHIP R	27 J 1/16W
R9			RK73HB1J470J	CHIP R 47 J 1/16W		R83			RK73HB1J561J	CHIP R	560 J 1/16W
R10_11			RK73HB1J332J	CHIP R 3.3K J 1/16W		R84			RK73HB1J180J	CHIP R	18 J 1/16W
R12			RK73HB1J472J	CHIP R 4.7K J 1/16W		R85			RK73HB1J182J	CHIP R	1.8K J 1/16W
R13			RK73HB1J184J	CHIP R 180K J 1/16W		R86			R92-1368-05	CHIP R	0 OHM
R14			RK73HB1J220J	CHIP R 22 J 1/16W		R87			RK73HB1J680J	CHIP R	68 J 1/16W
R15			RK73HB1J224J	CHIP R 220K J 1/16W		R89			R92-1368-05	CHIP R	0 OHM
R16			RK73HB1J222J	CHIP R 2.2K J 1/16W		R90			RK73HB1J152J	CHIP R	1.5K J 1/16W
R17			RK73HB1J220J	CHIP R 22 J 1/16W		R91			RK73HB1J334J	CHIP R	330K J 1/16W
R18_20			RK73HB1J103J	CHIP R 10K J 1/16W		R92			RK73HB1J104J	CHIP R	100K J 1/16W
R21			RK73HB1J154J	CHIP R 150K J 1/16W		R93			RK73HB1J561J	CHIP R	560 J 1/16W
R22			RK73HB1J562J	CHIP R 5.6K J 1/16W		R94			RK73HB1J221J	CHIP R	220 J 1/16W
R23			RK73HB1J470J	CHIP R 47 J 1/16W		R95			RK73HB1J472J	CHIP R	4.7K J 1/16W
R24			RK73HB1J154J	CHIP R 150K J 1/16W		R96			RK73HB1J391J	CHIP R	390 J 1/16W
R25			RK73HB1J562J	CHIP R 5.6K J 1/16W		R97			RK73HB1J472J	CHIP R	4.7K J 1/16W
R26			RK73HB1J470J	CHIP R 47 J 1/16W		R98			RK73HB1J470J	CHIP R	47 J 1/16W
R27_28			RK73HB1J104J	CHIP R 100K J 1/16W		R99			RK73HB1J103J	CHIP R	10K J 1/16W
R29			RK73HB1J222J	CHIP R 2.2K J 1/16W		R100			RK73HB1J334J	CHIP R	330K J 1/16W
R30			RK73HB1J105J	CHIP R 1.0M J 1/16W		R101			RK73HB1J470J	CHIP R	47 J 1/16W
R31			RK73HB1J332J	CHIP R 3.3K J 1/16W		R102			RK73HB1J102J	CHIP R	1.0K J 1/16W
R32			RK73HB1J223J	CHIP R 22K J 1/16W		R103			RK73HB1J152J	CHIP R	1.5K J 1/16W
R33			RK73HB1J103J	CHIP R 10K J 1/16W		R104			RK73HB1J473J	CHIP R	47K J 1/16W
R34			RK73HB1J273J	CHIP R 27K J 1/16W		R105			RK73HB1J272J	CHIP R	2.7K J 1/16W
R35			RK73HB1J103J	CHIP R 10K J 1/16W		R106			RK73HB1J103J	CHIP R	10K J 1/16W
R36			RK73HB1J101J	CHIP R 100 J 1/16W		R107			RK73HB1J223J	CHIP R	22K J 1/16W
R37_38			RK73HB1J272J	CHIP R 2.7K J 1/16W		R108			RK73HB1J102J	CHIP R	1.0K J 1/16W
R39			RK73HB1J182J	CHIP R 1.8K J 1/16W		R110			RK73HB1J223J	CHIP R	22K J 1/16W
R40			RK73HB1J332J	CHIP R 3.3K J 1/16W		R113			RK73HB1J222J	CHIP R	2.2K J 1/16W
R41			RK73HB1J272J	CHIP R 2.7K J 1/16W		R114-116			RK73HB1J103J	CHIP R	10K J 1/16W
R42			RK73HB1J152J	CHIP R 1.5K J 1/16W		R117			RK73HB1J332J	CHIP R	3.3K J 1/16W
R43_45			RK73HB1J392J	CHIP R 3.9K J 1/16W		R118			RK73HB1J274J	CHIP R	270K J 1/16W
R46			RK73HB1J562J	CHIP R 5.6K J 1/16W		R119			RK73HB1J154J	CHIP R	150K J 1/16W
R49			RK73HB1J561J	CHIP R 560 J 1/16W		R120			RK73HB1J472J	CHIP R	4.7K J 1/16W
R50			RK73HB1J151J	CHIP R 150 J 1/16W		R121			RK73HB1J562J	CHIP R	5.6K J 1/16W
R51			RK73HB1J182J	CHIP R 1.8K J 1/16W		R122			RK73HB1J122J	CHIP R	1.2K J 1/16W
R52			RK73HB1J220J	CHIP R 22 J 1/16W		R123			RK73HB1J561J	CHIP R	560 J 1/16W

PARTS LIST

TX-RX UNIT (X57-5410-XX)

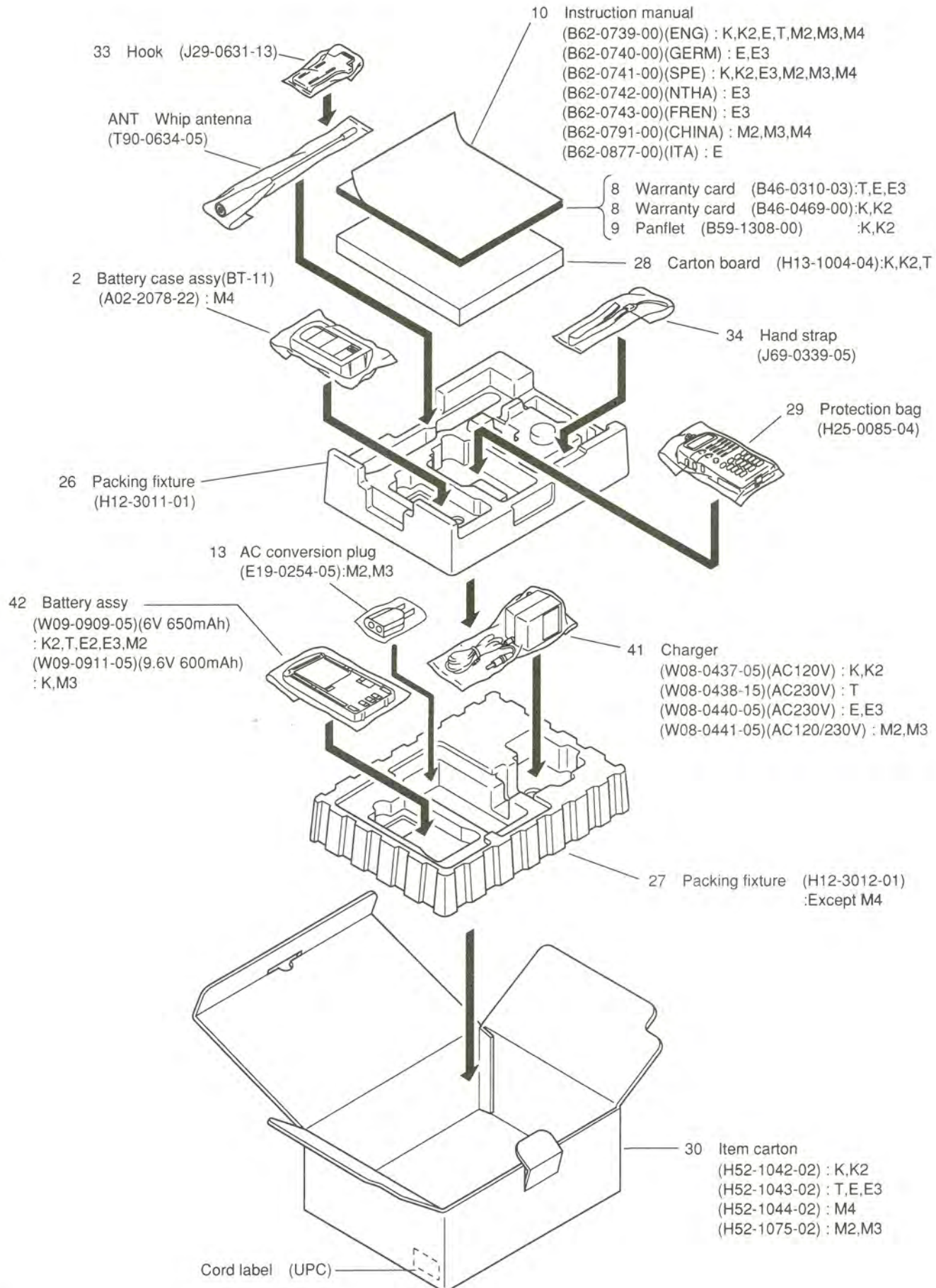
Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R124			RK73HB1J224J	CHIP R 220K J 1/16W		R347-349			RK73HB1J103J	CHIP R 10K J 1/16W	
R125			RK73HB1J683J	CHIP R 68K J 1/16W		R350			RK73HB1J101J	CHIP R 100 J 1/16W	
R126,127			RK73HB1J102J	CHIP R 1.0K J 1/16W		R351			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R128			RK73HB1J104J	CHIP R 100K J 1/16W		R352			RK73HB1J273J	CHIP R 27K J 1/16W	
R129			RK73HB1J220J	CHIP R 22 J 1/16W		R353			RK73HB1J224J	CHIP R 220K J 1/16W	
R130			RK73HB1J222J	CHIP R 2.2K J 1/16W		R354		R92-1368-05	CHIP R 0 OHM		
R131			RK73HB1J104J	CHIP R 100K J 1/16W		R355			RK73HB1J474J	CHIP R 470K J 1/16W	
R132			RK73HB1J221J	CHIP R 220 J 1/16W		R356			RK73HB1J471J	CHIP R 470 J 1/16W	
R133			RK73HB1J224J	CHIP R 220K J 1/16W		R357			RK73HB1J104J	CHIP R 100K J 1/16W	
R134-136			RK73HB1J104J	CHIP R 100K J 1/16W		R358			RK73HB1J474J	CHIP R 470K J 1/16W	
R137			RK73HB1J472J	CHIP R 4.7K J 1/16W		R360			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R138			RK73HB1J103J	CHIP R 10K J 1/16W		R361			RK73HB1J224J	CHIP R 220K J 1/16W	
R139			RK73HB1J104J	CHIP R 100K J 1/16W		R362			RK73HB1J101J	CHIP R 100 J 1/16W	
R140			RK73HB1J823J	CHIP R 82K J 1/16W		R363,364			RK73HB1J103J	CHIP R 10K J 1/16W	
R141			RK73HB1J103J	CHIP R 10K J 1/16W		R365,366			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R142			RK73HB1J563J	CHIP R 56K J 1/16W		R367			RN73HH1J104D	CHIP R 100K D 1/16W	
R143			RK73HB1J180J	CHIP R 18 J 1/16W		R368			RK73HB1J274J	CHIP R 270K J 1/16W	
R144			RK73HB1J471J	CHIP R 470 J 1/16W		R369			RK73HB1J101J	CHIP R 100 J 1/16W	
R145			RK73HB1J562J	CHIP R 5.6K J 1/16W		R370			RK73HB1J474J	CHIP R 470K J 1/16W	
R146			RK73HB1J472J	CHIP R 4.7K J 1/16W		R371			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R147			RK73HB1J470J	CHIP R 47 J 1/16W		R374			RK73HB1J100J	CHIP R 10 J 1/16W	
R148			RK73HB1J152J	CHIP R 1.5K J 1/16W		R375			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R149			RK73HB1J104J	CHIP R 100K J 1/16W		R377			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R150			R92-1252-05	CHIP R 0 OHM		R378			RK73HB1J100J	CHIP R 10 J 1/16W	
R151			RK73HB1J563J	CHIP R 56K J 1/16W		R379			RK73HB1J221J	CHIP R 220 J 1/16W	
R152-154			RK73EB2ER39K	CHIP R 0.39 K 1/4W		R380			RK73HB1J103J	CHIP R 10K J 1/16W	
R155			RK73HB1J472J	CHIP R 4.7K J 1/16W		R381			RK73HB1J473J	CHIP R 47K J 1/16W	
R156			R92-1368-05	CHIP R 0 OHM		R382			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R157			RK73HB1J222J	CHIP R 2.2K J 1/16W		R383			RK73HB1J333J	CHIP R 33K J 1/16W	
R158			RK73HB1J221J	CHIP R 220 J 1/16W		R384			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R159			RK73HB1J224J	CHIP R 220K J 1/16W		R385			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R160			RK73HB1J102J	CHIP R 1.0K J 1/16W		R387,386			RK73HB1J824J	CHIP R 820K J 1/16W	
R161,162			RK73HB1J224J	CHIP R 220K J 1/16W		R388			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R300			RK73HB1J102J	CHIP R 1.0K J 1/16W		R389			RK73HB1J124J	CHIP R 120K J 1/16W	
R302			RK73HB1J102J	CHIP R 1.0K J 1/16W		R390			RK73HB1J473J	CHIP R 47K J 1/16W	
R304			RK73HB1J103J	CHIP R 10K J 1/16W		R391			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R313			RK73HB1J223J	CHIP R 22K J 1/16W		R392-394			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R314			RK73HB1J472J	CHIP R 4.7K J 1/16W		R395			RK73HB1J224J	CHIP R 220K J 1/16W	
R316			RK73GB1J101J	CHIP R 100 J 1/16W		R396			RK73HB1J334J	CHIP R 330K J 1/16W	
R318			RK73HB1J182J	CHIP R 1.8K J 1/16W		R397			RK73HB1J474J	CHIP R 470K J 1/16W	
R319			RK73HB1J101J	CHIP R 100 J 1/16W		R398			R92-1368-05	CHIP R 0 OHM	
R320			RK73HB1J472J	CHIP R 4.7K J 1/16W		R399			RK73HB1J393J	CHIP R 39K J 1/16W	
R321			RK73GB1J123J	CHIP R 12K J 1/16W		R400			RK73HB1J224J	CHIP R 220K J 1/16W	
R322,323			RK73HB1J103J	CHIP R 10K J 1/16W		R401			RK73HB1J563J	CHIP R 56K J 1/16W	
R324			RK73HB1J472J	CHIP R 4.7K J 1/16W		R402			RK73HB1J123J	CHIP R 12K J 1/16W	
R325			RK73HB1J564J	CHIP R 560K J 1/16W		R403			RK73HB1J682J	CHIP R 6.8K J 1/16W	
R326,327			RK73HB1J102J	CHIP R 1.0K J 1/16W		R404			RK73HB1J473J	CHIP R 47K J 1/16W	
R328,329			RK73HB1J393J	CHIP R 39K J 1/16W		R405			RK73HB1J682J	CHIP R 6.8K J 1/16W	
R330			RK73HB1J471J	CHIP R 470 J 1/16W		R406			RK73HB1J393J	CHIP R 39K J 1/16W	
R331			RK73HB1J274J	CHIP R 270K J 1/16W		R407,408			RK73HB1J103J	CHIP R 10K J 1/16W	
R332,333			RK73HB1J472J	CHIP R 4.7K J 1/16W		R409			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R334			RK73HB1J182J	CHIP R 1.8K J 1/16W		R410			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R337			RK73HB1J564J	CHIP R 560K J 1/16W		R411			RK73HB1J821J	CHIP R 820 J 1/16W	
R339			RK73HB1J100J	CHIP R 10 J 1/16W		R412			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R340			RK73HB1J470J	CHIP R 47 J 1/16W		R413			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R341			RK73HB1J471J	CHIP R 470 J 1/16W		R414			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R343			RK73HB1J393J	CHIP R 39K J 1/16W		R415,416			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R344			RK73GB1J103J	CHIP R 10K J 1/16W		R417			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R345			RK73GB1J120J	CHIP R 12 J 1/16W		R418			RK73HB1J821J	CHIP R 820 J 1/16W	
R346			RK73HB1J474J	CHIP R 470K J 1/16W		R419			RK73HB1J472J	CHIP R 4.7K J 1/16W	

PARTS LIST

TX-RX UNIT (X57-5410-XX)

Ref.No.	Address	New parts	PartsNo.	Description	Destination	Ref.No.	Address	New parts	PartsNo.	Description	Destination
R420			RK73HB1J152J	CHIP R 1.5K J 1/16W		Q10			2SC4617(R)	TRANSISTOR	
R421			RK73HB1J102J	CHIP R 1.0K J 1/16W		Q11			2SC4649(N,P)	TRANSISTOR	
R422			RK73HB1J220J	CHIP R 22 J 1/16W		Q12 -14			2SC4617(R)	TRANSISTOR	
R423			RK73HB1J563J	CHIP R 56K J 1/16W		Q15			2SC3356	TRANSISTOR	
R424			RK73HB1J470J	CHIP R 47 J 1/16W		Q16			2SC5108(Y)	TRANSISTOR	
R425,426			R92-1368-05	CHIP R 0 OHM		Q17			3SK239A	FET	
R427			RK73HB1J474J	CHIP R 470K J 1/16W		Q19			2SC3356	TRANSISTOR	
VR330,33			R12-7490-05	TRIMMING POT.(47K)		Q20 ,21			3SK239A	FET	
D1,2			MA2S111	DIODE		Q22			2SC4617(R)	TRANSISTOR	
D3-6			MA2S077	DIODE		Q23 -26			2SC5108(Y)	TRANSISTOR	
D7			DA221	DIODE		Q27			2SC4617(R)	TRANSISTOR	
D8			MA2S077	DIODE		Q28			DTC144EE	DIGITAL TRANSISTOR	
D9		*	RB706F-40	DIODE		Q29			3SK239A	FET	
D10			DA221	DIODE		Q30			UMC4	TRANSISTOR	
D11			HVU131	DIODE		Q31		*	UMX2N	TRANSISTOR	
D12 -14		*	DAN235E	DIODE		Q300			2SC4617(R)	TRANSISTOR	
D15 -17			MA2S077	DIODE		Q301			2SC4738(GR)	TRANSISTOR	
D18 ,19			HVC350B	VARIABLE CAPACITANCE DIODE		Q302			2SK1824	FET	
D20			DA221	DIODE		Q303			UMG1	TRANSISTOR	
D21			HVU131	DIODE		Q304		*	UMA11N	TRANSISTOR	
D22			MA2S077	DIODE		Q305			UPA672T	FET	
D23 -25			HVC350B	VARIABLE CAPACITANCE DIODE		Q306			UMC5	TRANSISTOR	
D26			HVU131	DIODE		Q307			2SJ243	FET	
D220		*	RB706F-40	DIODE		Q308			2SK1824	FET	
D300			1SS357	DIODE		Q309			2SC4617(R)	TRANSISTOR	
D301			MA2S111	DIODE		Q310			2SK1588	FET	
D302			DTZ3.9(B)	DIODE	T,E,E3	Q312		*	2SB1184(Q,R)	TRANSISTOR	
D302			DTZ3.9(B)	DIODE	M2,M3,M4	Q313			2SC4617(R)	TRANSISTOR	
D319			MA2S111	DIODE		Q314		*	2SB1184(Q,R)	TRANSISTOR	
D320			MAZS05600	ZENER DIODE		Q315			UMW1	TRANSISTOR	
D321			SFPB-72VL	DIODE		Q316-319		*	UMA11N	TRANSISTOR	
D322			DA221	DIODE		Q320		*	UMA10N	TRANSISTOR	
D323-325			RB751V-40	DIODE		Q321			2SD1483	TRANSISTOR	
D326			MAZS05600	ZENER DIODE		Q322			2SB1188(Q)	TRANSISTOR	
D327			DTZ3.9(B)	ZENER DIODE		Q323			2SK1588	FET	
IC1		*	KCH36	HIC		Q324			UMC5	TRANSISTOR	
IC2			MB15A01	IC(PLL IC)		Q325			UPA572T	TRANSISTOR	
IC3		*	TC4W66FU	IC		Q326			2SB1188(Q)	TRANSISTOR	
IC4			MC3372SV	IC(LO POWER FMIC)		Q327			UMW1	TRANSISTOR	
IC5			TC4W53FU	IC(2 INPUT NAND GATE)		Q328			2SK1824	FET	
IC8			TA75S01F	IC(OP AMP)		Q329			2SC5108(Y)	TRANSISTOR	
IC301		*	UPD78054GK-538	IC(CPU)	K,K2	TH330			TN103S472JT	THERMISTOR 4.7K	
IC301		*	UPD78054GK-541	IC(CPU)	T,E,E3	TH700			157-104-65001	THERMISTOR 100K	
IC301		*	UPD78054GK-541	IC(CPU)	M2,M3,M4						
IC302,303			LMC7101BIM5	IC(OP AMP)							
IC305			S-81335HG-KI	IC							
IC306		*	RN5VT25A	IC							
IC307		*	RN5VL30C	IC							
IC308			TC7660SEQA	IC							
IC309		*	AT24C64N10SI18	IC(EEP ROM)							
IC311			AK2343	IC(CTCSS ENCODER/DECODER)							
IC312			KIA6278F	IC							
IC313			TC4W53FU	IC(2 INPUT NAND GATE)							
Q1,2			2SC4617(R)	TRANSISTOR							
Q3-6			2SC5108(Y)	TRANSISTOR							
Q7			2SA1832(GR)	TRANSISTOR							
Q8			2SC4738(GR)	TRANSISTOR							
Q9			2SC4649(N,P)	TRANSISTOR							

PACKING



ADJUSTMENT

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 300 mA and 3A.
- ③ A cable with low internal loss must be used.

3. Frequency Counter (f. counter)

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

4. Power Meter (terminal type)

- ① Measurable frequency: Up to 500 MHz
- ② Impedance: 50 Ω , 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 500 MHz or so

6. Linear Detector

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

7. Digital Voltmeter

- ① Voltage range: FS = 18V or so
- ② Input resistance: 1 M Ω or more

8. Oscilloscope

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

9. AF Voltmeter (AF V.M)

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

10. Spectrum Analyzer

- ① Measuring range: DC to 1 GHz or more

11. Standard Signal Generator (SSG)

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

12. Tracking Generator

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

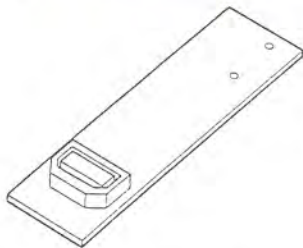
13. Dummy Load

- ① 8 Ω , 3W or more

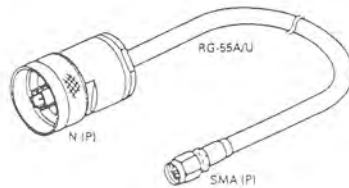
Preparations

- Use a non-conductive rod such as a Bakelite rod for adjustment (especially of trimmers and coils).
- To protect the SSG, do not send out signals while adjusting the receiving unit.
- The SSG output levels give the values are for maximum output. Also, unless otherwise specified, use the standard modulation (modulation: 1 kHz, deviation: ± 3 kHz).

Adjustment service jig



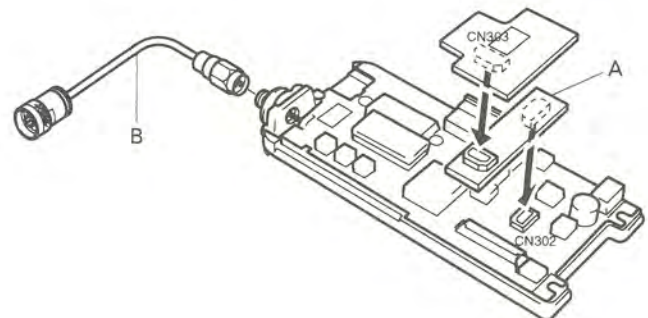
A : Connector P board
(W05-0663-00)



B : Antenna cable (length 1 m)
(E30-3226-05)

Service jig usage method

- First, insert the connector P board jig (W05-0663-00) into the daughter P board (TX-RX unit: B/2).
- Next, insert the other end into the main unit side (TX-RX unit: A/2).



ADJUSTMENT

How to use the "Set Mode"

About the Set mode

When this TH-G71A/E is set to Set mode, the following levels can be set.


1. The squelch critical point for each band
2. The S meter first lighting for each band
3. The S meter all lighting for each band
4. The HI/LO/EL transmission output for each band
5. The reference voltage for overvoltage alarms (13.8V)

The levels set with set mode are written into the E²PROM. Therefore, this data is retained even if the power is cut off or the device is reset.













When the E²PROM is replaced, it is necessary to write (set) all these items again.

Setting procedure




1. Open up the main unit and with the power ON, briefly short the Set points (see figure below) on the component side of the switch unit (B/2) (with tweezers or the like).

The beeper beeps and the  mark flashes on the display to show that the device has entered Set mode.

2. The functions of the keys in Set mode are as follows.


-  : Squelch critical point setting
-  : S meter S1 (1st lighting) level setting
-  : S meter S5 (all lighting) level setting
-  : Overvoltage alarm reference voltage (13.8V) identification setting
-  : Overvoltage alarm check mode (alarm beeps)
-  : Ending 
-  +  +  : Transmission output level setting
-  : 144/430MHz bands
-  : Transmission output (HI/LO/EL) switching
(In Set mode, the F key are not accepted.)


3. Input the SSG level to be set for each band from the ANT terminal and press the Set key. (See table below.)

	SQ level	S1 level	S5 level
Key pressed			
Band (SSG frequency)			
VHF Band 145.020MHz:E,T 146.020MHz:K,M	-124dBm	-120dBm	-105dBm
UHF Band 435.020MHz:E,T 445.020MHz:K,M	-124dBm	-120dBm	-105dBm
AIR Band 118.000MHz	-124dBm	-120dBm	-105dBm
300MHz Band 340.000MHz	-124dBm	-120dBm	-105dBm
800MHz Band 860.000MHz	-124dBm	-120dBm	-105dBm

Note : The SSG uses standard modulation.


4. Overvoltage alarm reference voltage (13.8V) identification setting

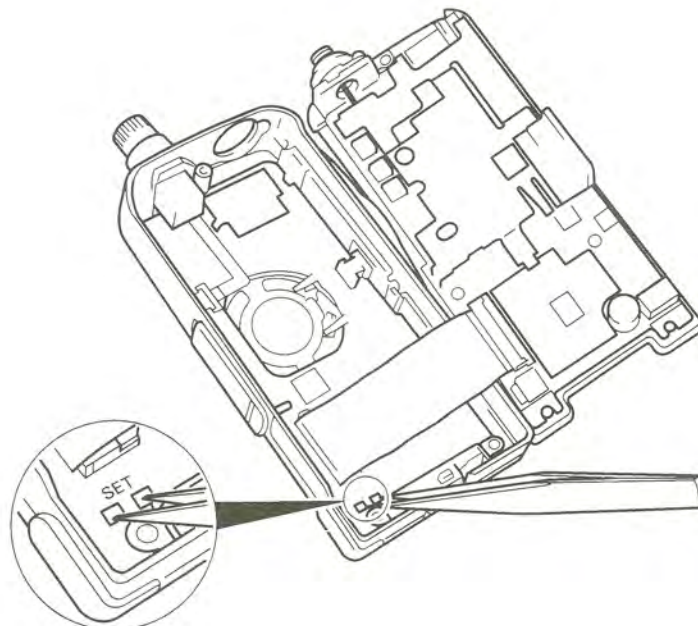
Apply the terminal voltage $13.8V \pm 0.05V$ from the stabilized power supply to the external power supply terminal (DC-IN), then press the  key.

Next, press the  key and check that the alarm sounds.

5. Set mode is ended by switching OFF the power.


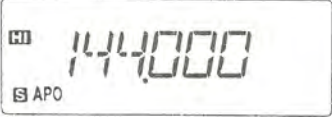
Note 1 : Since these settings overwrite the previous data, they can be set independently and in any order.

For 144MHz bands  Flashing

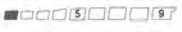
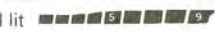


ADJUSTMENT

Section common to transmission and reception

Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting and reset	1) External power supply connection DC-IN terminal voltage: 13.8V 2) All-lit display check While pressing the F key, switch the POWER switch ON. 3) All reset Within ten seconds after the all-lit display, press the F key again.	LCD all-lit display			Default setting display after all reset			
								

VHF reception section

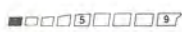
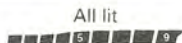
Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Helical (BPF)	1) Tracking generating output:-45 dBm Center: 145.000 MHz:E,T 146.000 MHz:K,M Span:50 MHz REF:-20 dBm	Tracking generator Spectrum analyzer	TX-RX (A/2)	ANT TP	TX-RX (A/2)	L41 L40 L39	The maximum level of the two markers is aligned to within 2 dB.	See Figure 1.
2. Large input S/N	1) Frequency: 145.020 MHz:E,T 146.020 MHz:K,M SSG:-53dBm	SSG Oscilloscope AFVM Distortion meter Ammeter Dummy load		ANT SP			S/N check (AF · VR:0.63V/8 Ω) Audio output check (AF · VR:MAX)	35 dB or more. 1.3V or more.
3. Sensitivity	1) Frequency: 144.020MHz SSG:-121dBm AF · VR:0.63V/8 Ω 2) Frequency: 145.020MHz:E,T 146.020MHz:K,M						Check	12 dB SINAD or more.
4. Current consumption	1) Frequency: 144.020MHz SSG:OFF						Check	70 mA or less.
5. S meter	1) Frequency: 144.020MHz SSG:-120dBm ± 6dBm 2) SSG:-105dBm ± 6dBm	SSG Oscilloscope		ANT SP		LCD	Check	 At least one lit All lit 
6. Squelch	1) Frequency: 144.020MHz SSG:OFF 2) SSG:-112dBm						Check	Squelch must be closed. Squelch must be opened.

VHF transmission section

Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Transmission output	1) BATT · IN:9.6V Frequency: 145.060MHz:M,E,T 146.060MHz: K Set to Set mode.	Power meter DC · A	TX-RX (A/2)	ANT	Panel	Display encoder	Turn the encoder and adjust the power meter reading to 5.0W.	± 0.2W
	2) Transmission output switching: HI PTT transmission Press 0 key during transmission. After setting, press 0 key again. Return to PTT.							(Less than 1.8A)
	3) DC · IN:6.0V ransmission output switching: LO Same method as 2)							± 0.1W
	4) DC · IN:6.0V Transmission output switching: EL Same method as 2)							± 10mW
2. DEV	1) Frequency: 145.060MHz: M,E,T 146.060MHz: K AG: 1kHz/70mV PTT:ON	Power meter Linear detector Oscilloscope		ANT	TX-RX (A/2)	VR331	Adjust to 4.2 kHz with larger ± .	± 100Hz
	2) AG: 20 dB down: (1 kHz/7 mV) PTT:ON	AG AFVM		MIC			Check (mic sensitivity)	± 1.8~2.6kHz

ADJUSTMENT

UHF reception section

Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Large input S/N	1) Frequency:430.020MHz:M,E,T :440.020MHz:K SSG:-53dBm AF · VR:0.63V/8 Ω	SSG Oscilloscope AFVM Distortion meter Ammeter Dummy load	TX-RX (A/2)	ANT SP			Check	35dB or more.
2. Sensitivity	1) Frequency:430.020MHz:M,E,T :440.020MHz:K SSG:-121dBm						Check	12dB SINAD or more.
	2) Frequency:435.020MHz:M,E,T :445.020MHz:K							
3. Current consumption	1) Frequency:430.020MHz:M,E,T :440.020MHz:K SSG:OFF					Check	70mA or less.	
4. S meter	1) Frequency:430.020MHz:M,E,T :440.020MHz:K SSG:-120dBm ± 6dBm	SSG Oscilloscope	TX-RX (A/2)	ANT SP		LCD	Check	 At least one lit
	2) SSG:-105dBm ± 6dBm							 All lit
5. Squelch	1) Frequency:435.020MHz:M,E,T :445.020MHz:K SSG:OFF						Check	Squelch must be closed.
	2) SSG:-112dBm							Squelch must be closed.

UHF transmission section

Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Transmission frequency	1) Frequency:439.980MHz:M,E,T :449.980MHz:K PTT:ON	Power meter F counter	TX-RX (A/2)	ANT	TX-RX (A/2)	TC1	Set to display frequency	± 200Hz
2. Transmission output	1) BATT · IN:9.6V Frequency:435.060MHz:M,E,T :445.060MHz:K Set to Set mode.	Power meter DC-A		ANT	Panel	Display encoder	Turn the encoder and adjust the power meter reading to 5.0W.	± 0.2W
	2) Transmission output switching: HI PTT transmission Press 0 key during transmission. After setting, press 0 key again. Return to PTT.						(Less than 1.9A)	
	3) DC · IN:6.0V Transmission output switching: LO Same method as 2)						Adjust to 0.5W.	± 0.1W
	4) DC · IN:6.0V Transmission output switching: EL Same method as 2)						Adjust to 50 mW.	± 10mW
3. DEV	1) Frequency:435.060MHz:M,E,T :445.060MHz:K AG:1kHz/70mV PTT:ON	Power meter Linear detector Oscilloscope		ANT	TX-RX (A/2)	VR330	Adjust to 4.2 kHz with larger ± .	± 100Hz
	2) AG:20dB down:1 kHz/7 mV PTT:ON	AG AFVM		MIC			Check (mic sensitivity)	± 1.8~2.6kHz
4. DTMF DEV	1) In transmitted state, press the D key.						DTMF DEV Check	± 2.2~4.2kHz
5. TONE DEV	1) Frequency:435.060MHz:M,E,T :445.060MHz:K Press F key → 6 key to display "CT". PTT:ON						Display check TONE DEV Check	"CT" display lit ± 0.4~1.2kHz

ADJUSTMENT

118,300,800MHz Band reception section

Item	Conditions	Measurement			Adjustment			Specifications/ Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
Sensitivity	118MHz Band 1) Frequency:118.000MHz SSG:-121dBm	SSG Oscilloscope AFVM Distortion meter Ammeter Dummy load	TX-RX (A/2)	ANT SP			Check	12dB SINAD or more
	300MHz Band 2) Frequency:340.000MHz SSG:-121dBm							
	800MHz Band 3) Frequency:860.000MHz SSG:-117dBm							

Parts layout diagram

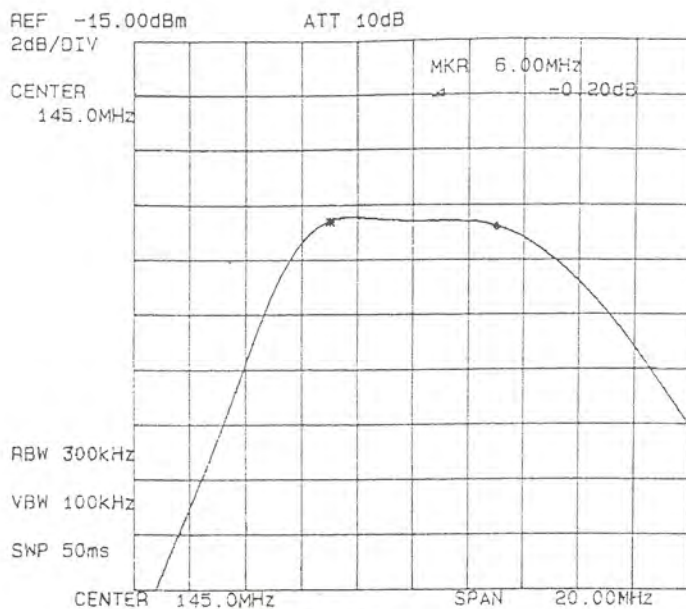
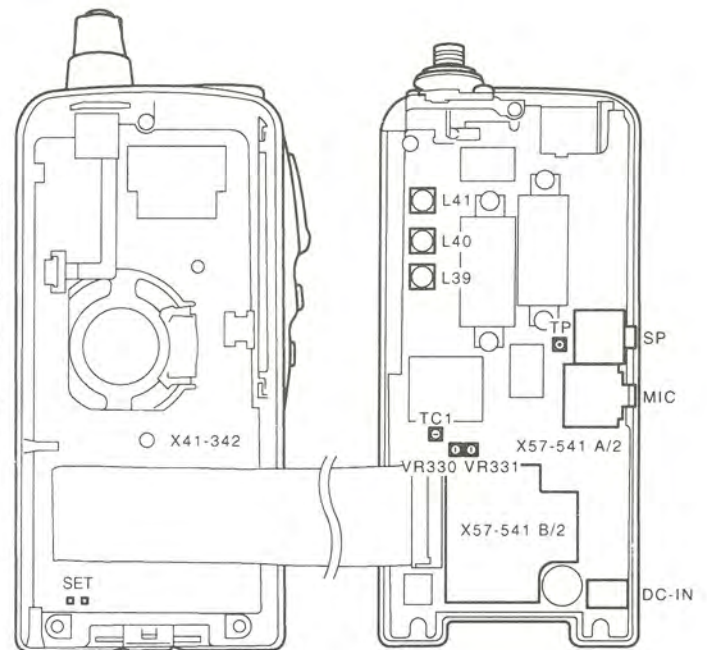


Figure 1. Helical (BPF) Adjustment Waveform
VHF Band



SWITCH unit

SET : Set mode test point

TX-RX unit (A/2)

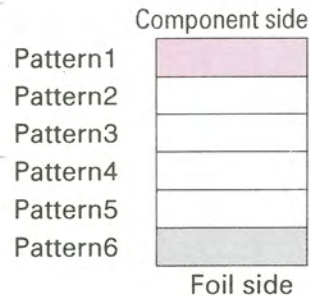
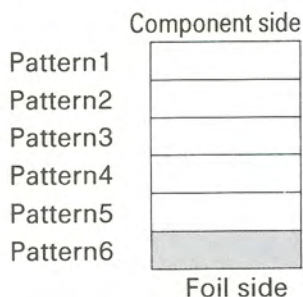
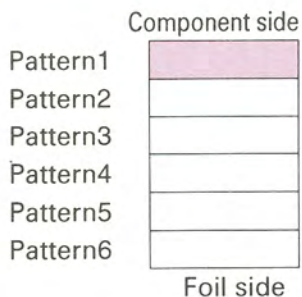
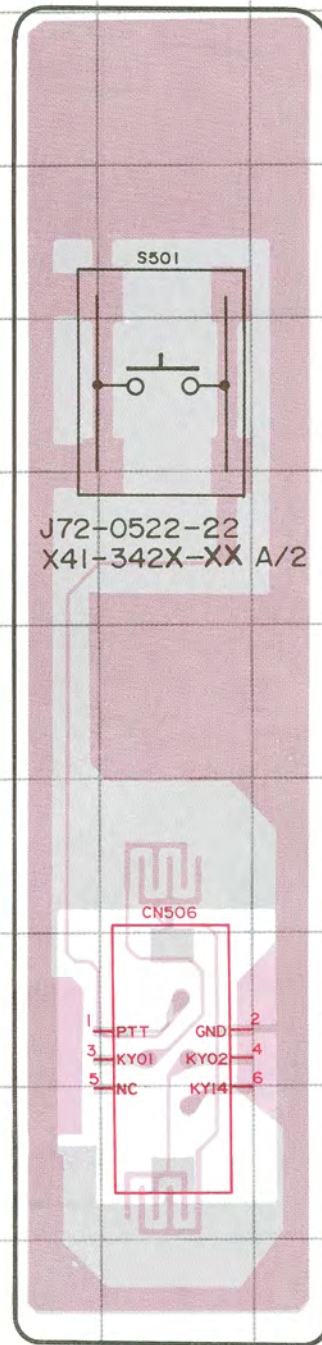
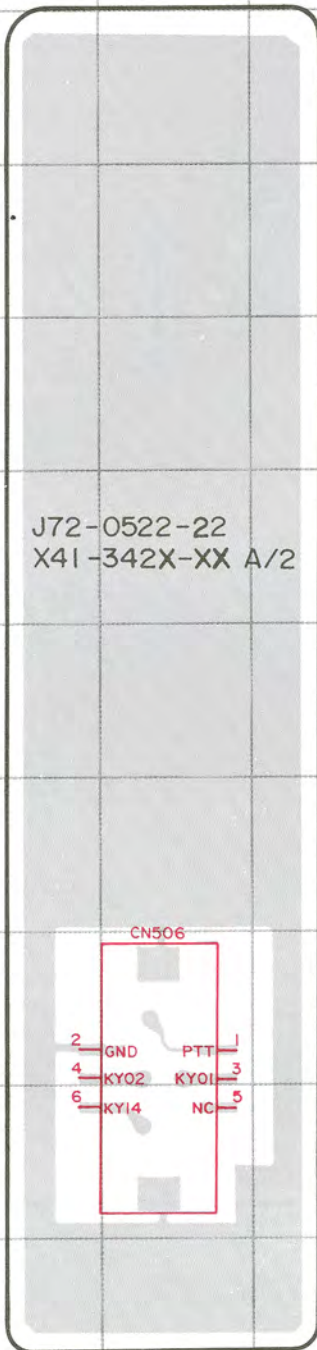
L41,40,39 : VHF helical
 TC1 : Transmission frequency
 (UHF)
 VR330 : DEV(UHF)
 VR331 : DEV(VHF)
 TP : Helical adjustment
 (spectrum analyzer point)

PC BOARD VIEWS TH-G71A/E

PTT UNIT (X41-342X-XX)
 (A/2) Component Side View
 0-11:K,K2,0-21:M2,M3
 ,M4,2-71:T,E,E3

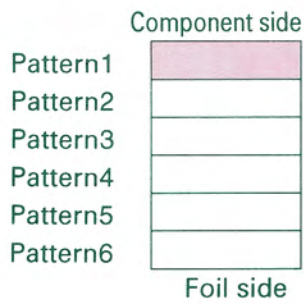
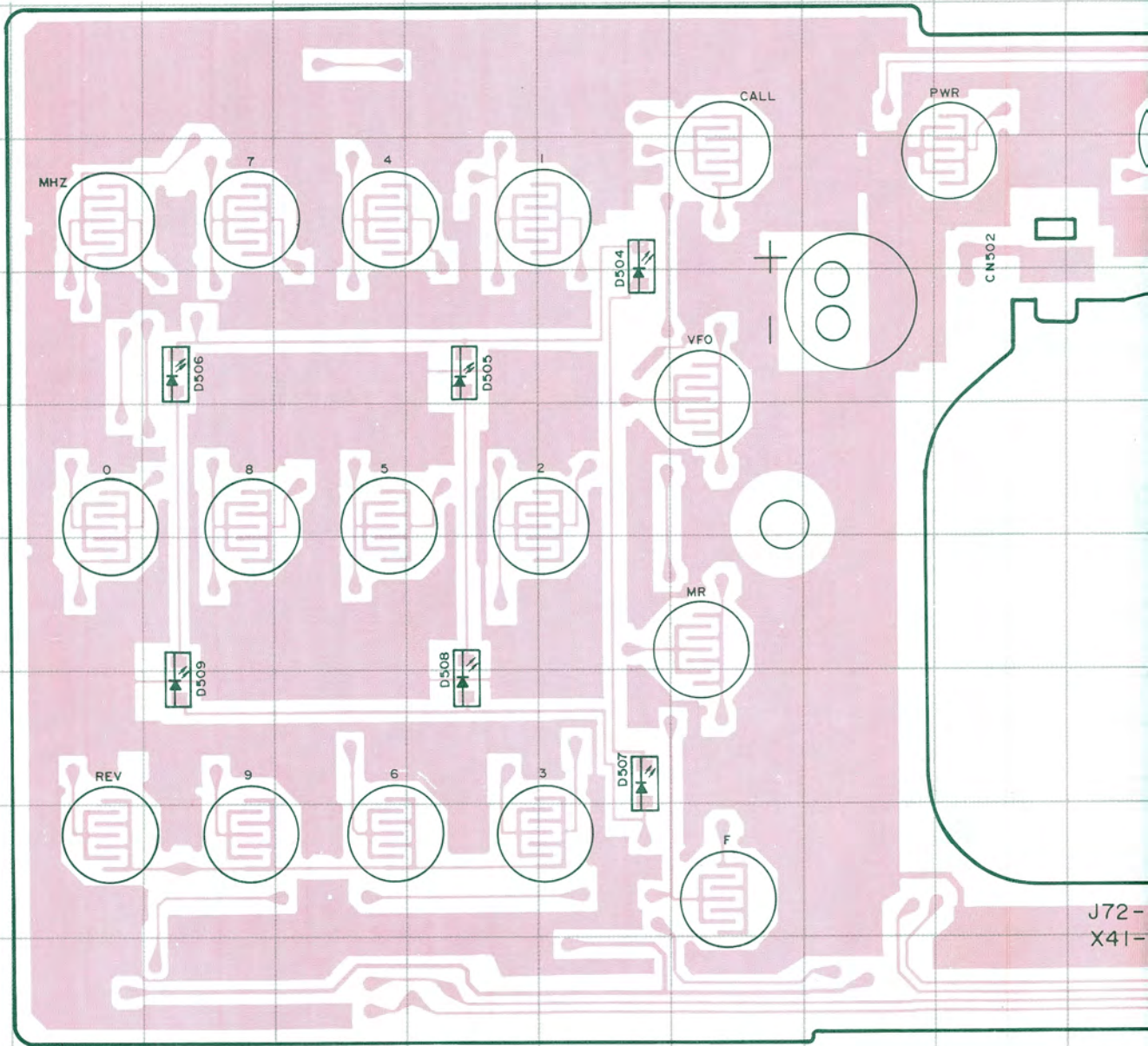
PTT UNIT (X41-342X-XX)
 (A/2) Foil Side View
 0-11:K,K2,0-21:M2,M3
 ,M4,2-71:T,E,E3

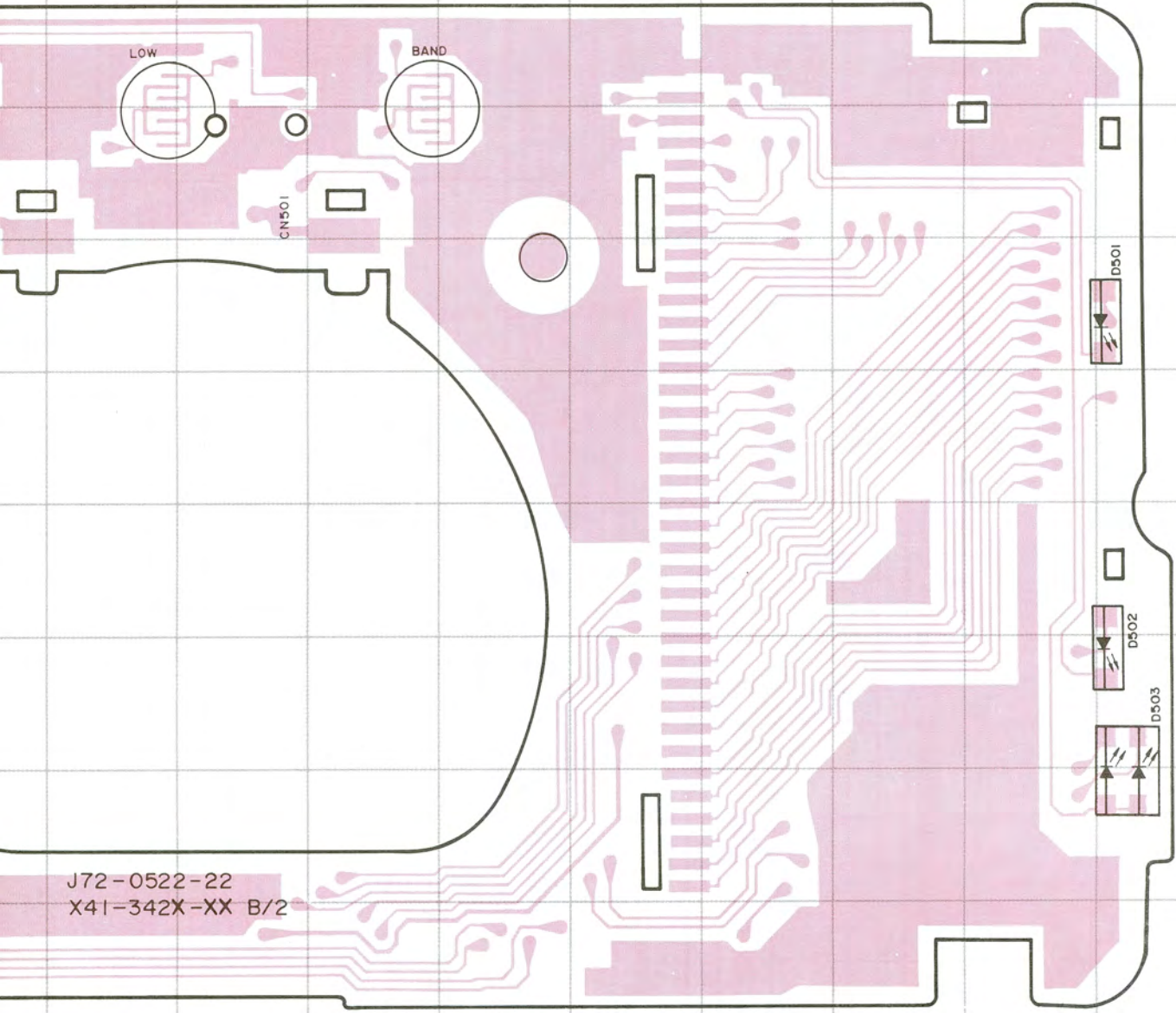
PTT UNIT(X41-342X-XX)
 (A/2)Component Side
 View+Foil Side View
 0-11:K,K2,0-21:M2,M3
 ,M4,2-71:T,E,E3



TH-G71A/E PC BOARD VIEWS

KEY UNIT (X41-342X-XX)(B/2) Component Side View
0-11:K,K2,0-21:M2,M3,M4,2-71:T,E,E3



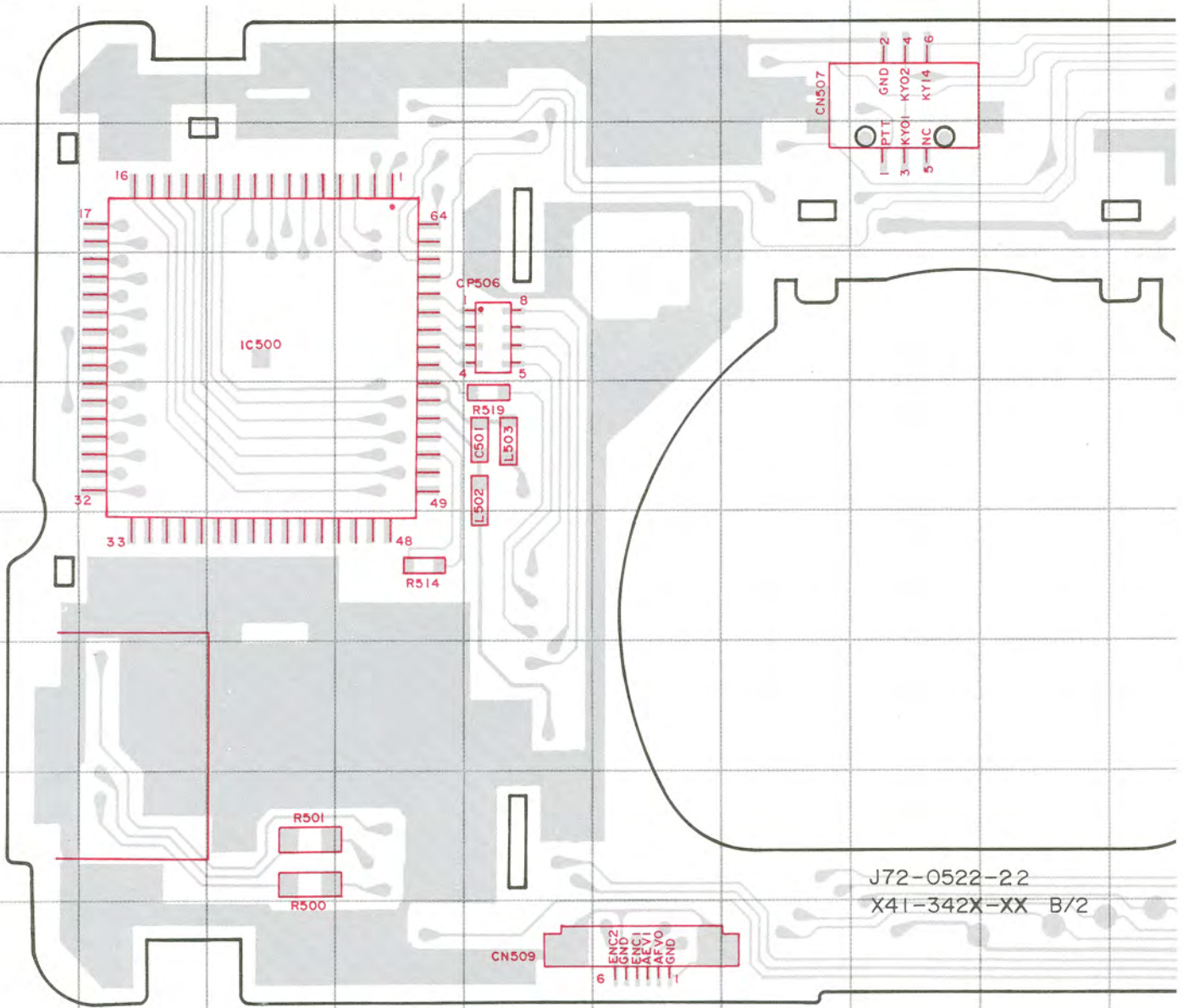


J72-0522-22
X41-342X-XX B/2

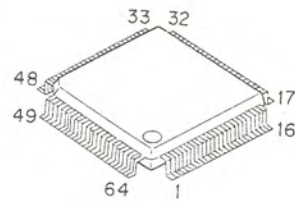
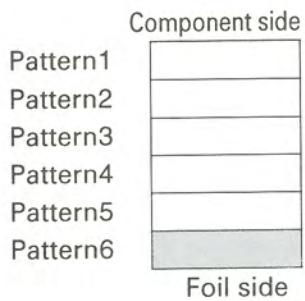
KEY UNIT (X41-342X-XX)
(B/2)(Component side)

Ref.NO.	Address
D501	5S
D502	8S
D503	8S
D504	4G
D505	5F
D506	5D
D507	8G
D508	7F
D509	8D

KEY UNIT (X41-342X-XX)(B/2) Foil Side View
0-11:K,K2,0-21:M2,M3,M4,2-71:T,E,E3

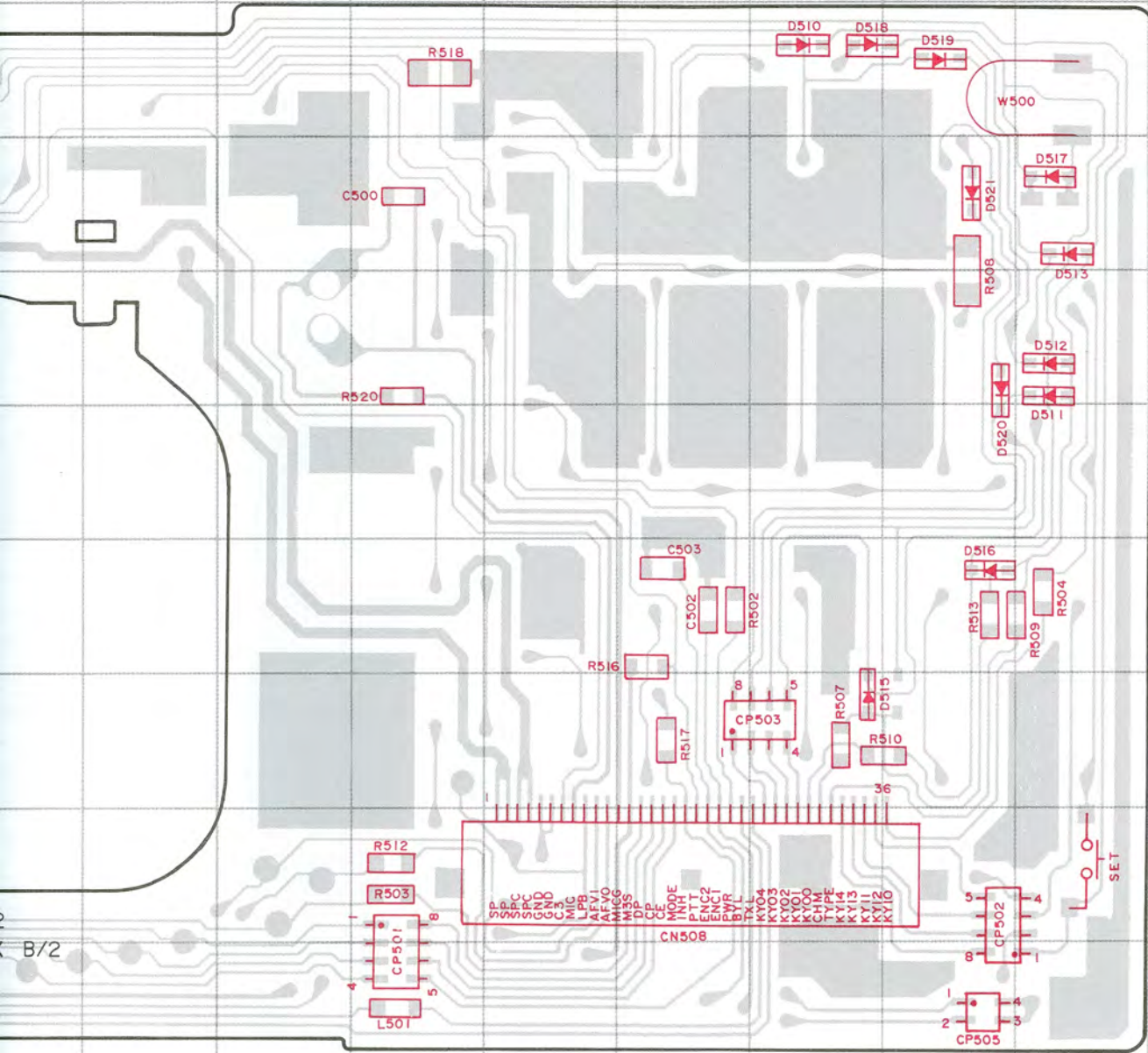


J72-0522-2.2
 X41-342X-XX B/2



NJU6433F

PC BOARD VIEWS TH-G71A/E



KEY UNIT (X41-342X-XX)
(B/2)(Foil side)

Ref.NO.	Address
IC500	5C
D510	3O
D511	5Q
D512	5Q
D513	4Q
D515	8O
D516	7P
D517	4Q
D518	3O
D519	3P
D520	5P
D521	4P

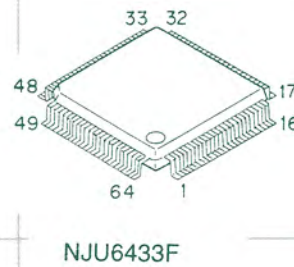
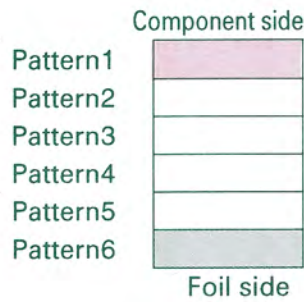
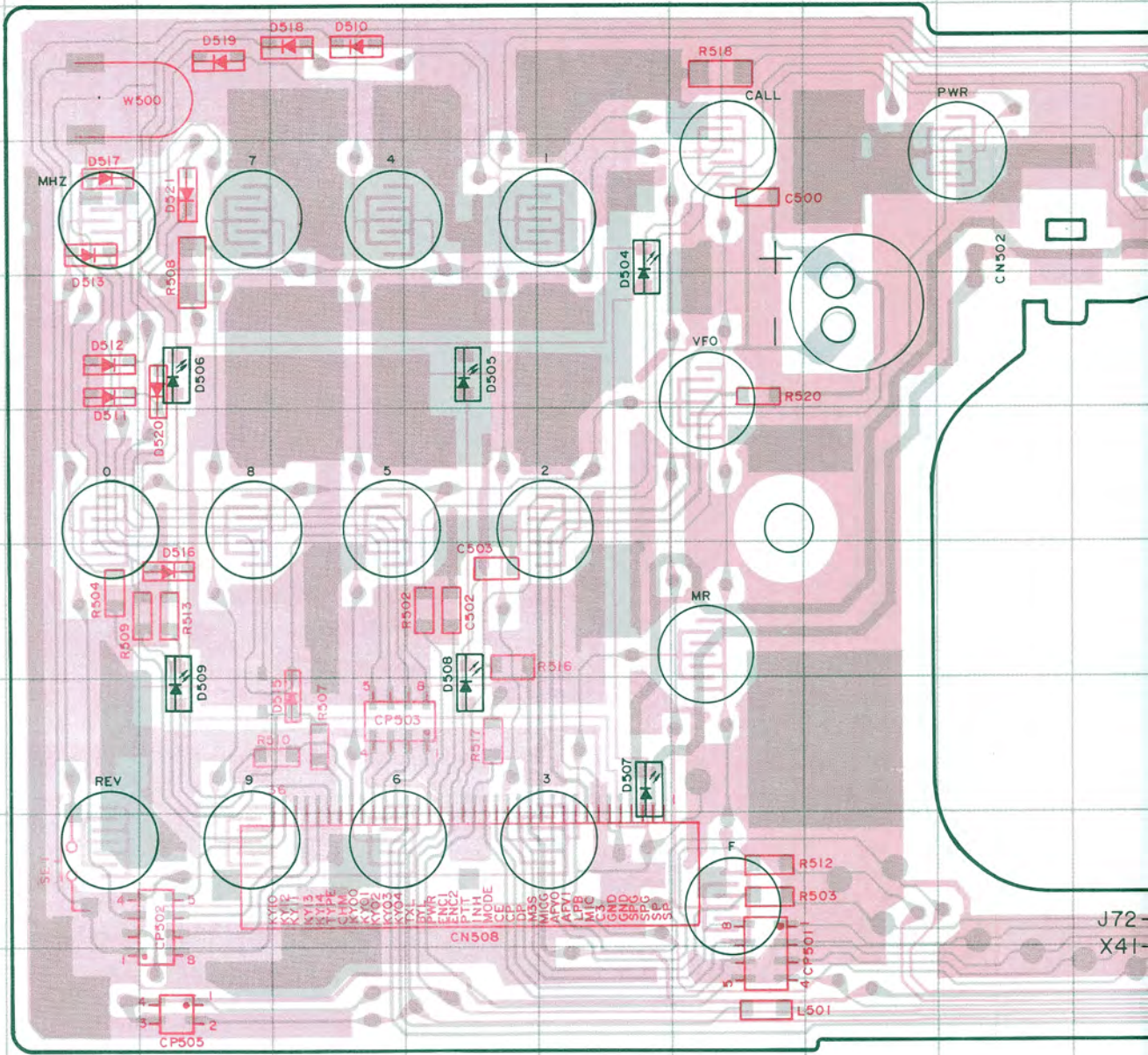
TH-G71A/E PC BOARD VIEWS

KEY UNIT (X41-342X-XX)

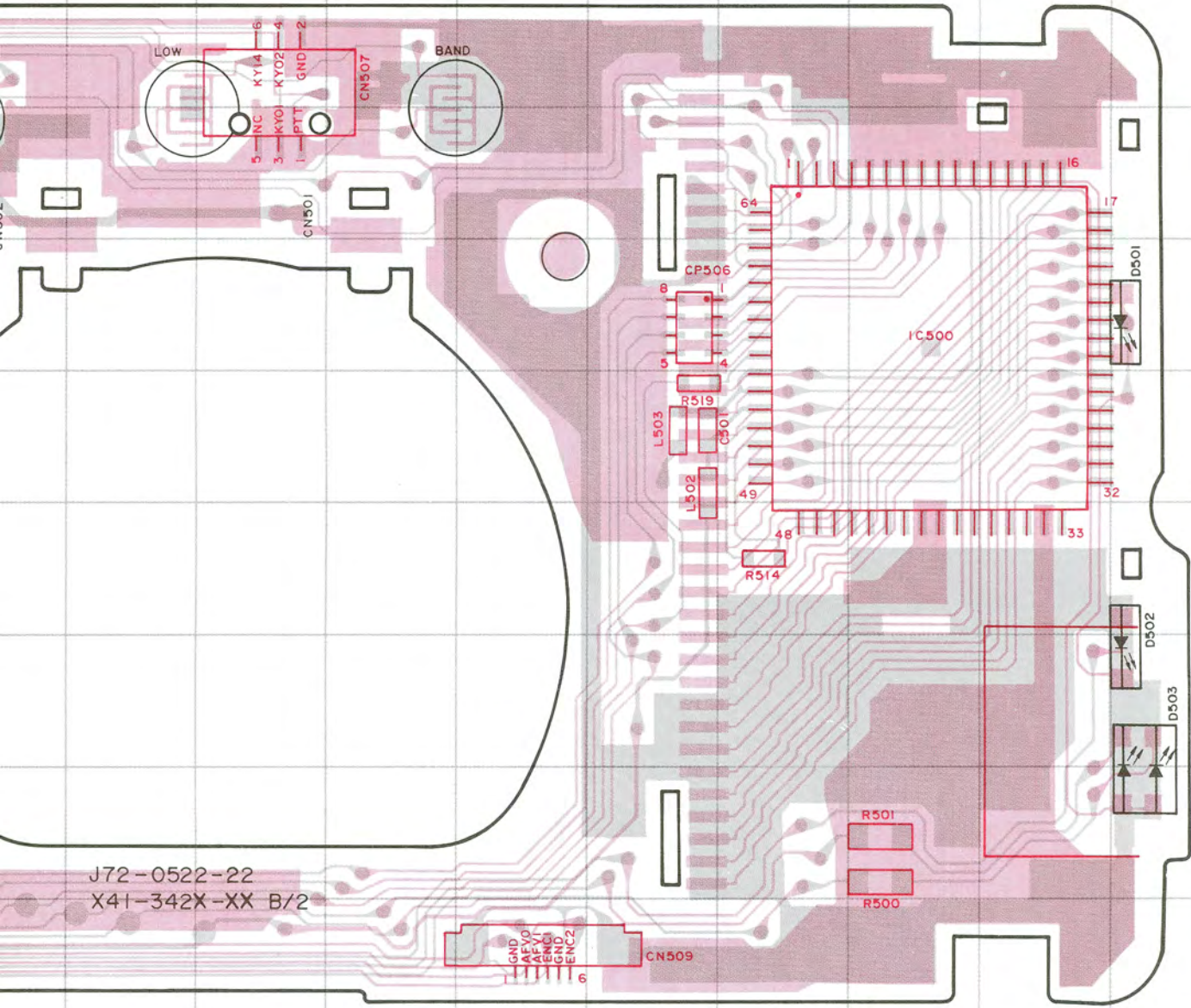
(B/2)(Component side) + (Foil side)

Ref.NO.	Address
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D501	5S
D502	8S
D503	8S
D504	4G
D505	5F
D506	5D
D507	8G
D508	8F
D509	8D
D510	3E
D511	5C
D512	5C
D513	4C
D515	8E
D516	7D
D517	4C
D518	3E
D519	3D
D520	5D
D521	4D

KEY UNIT(X41-342X-XX)(B/2) Component Side View+Foil Side View 0-11:K,K2,0-21:M2,M3,M4,2-71:T,E,E3

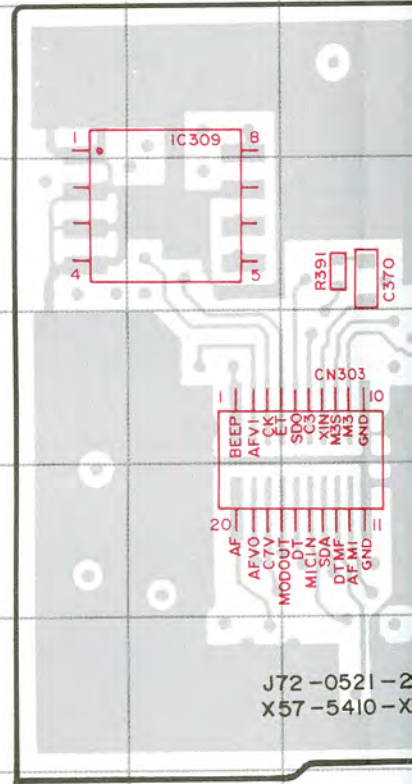
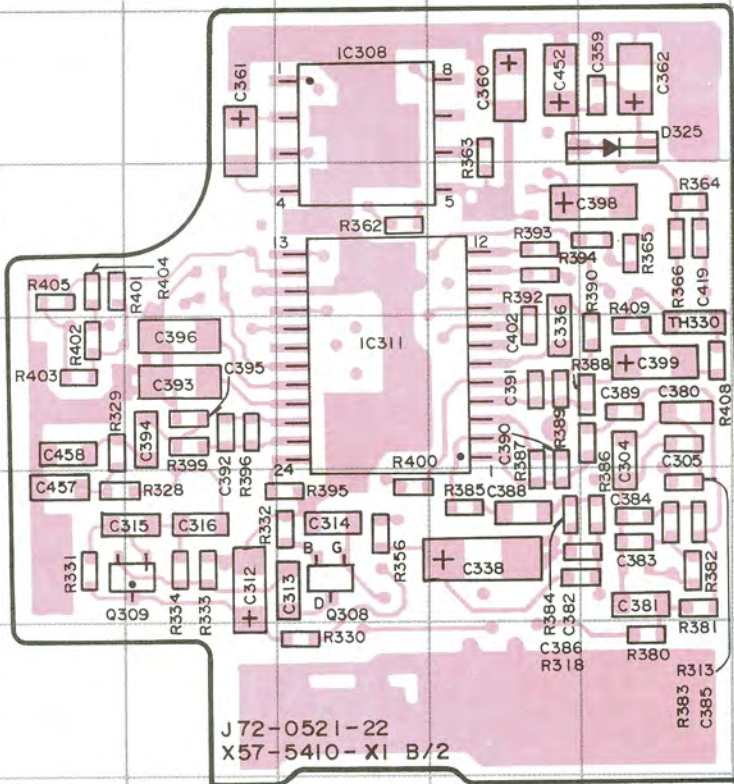


le View



**TX-RX UNIT (X57-5410-XX)(B/2) Component Side View
-11:K,K2,-21:T,E,E3,M2,M3,M4**

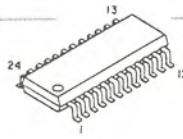
**TX-RX UNIT (X57-5410-XX)
-11:K,K2,-21:T,E,E3,M2,M3,M4**



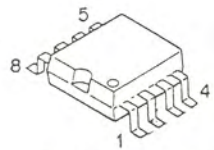
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2SC4617



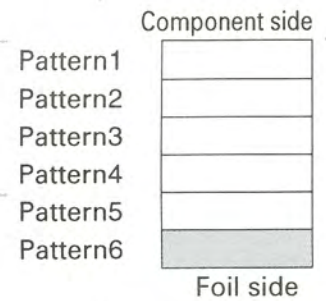
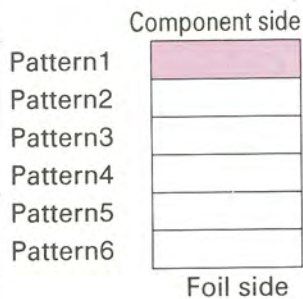
AK2343



AT24C64N10SI18

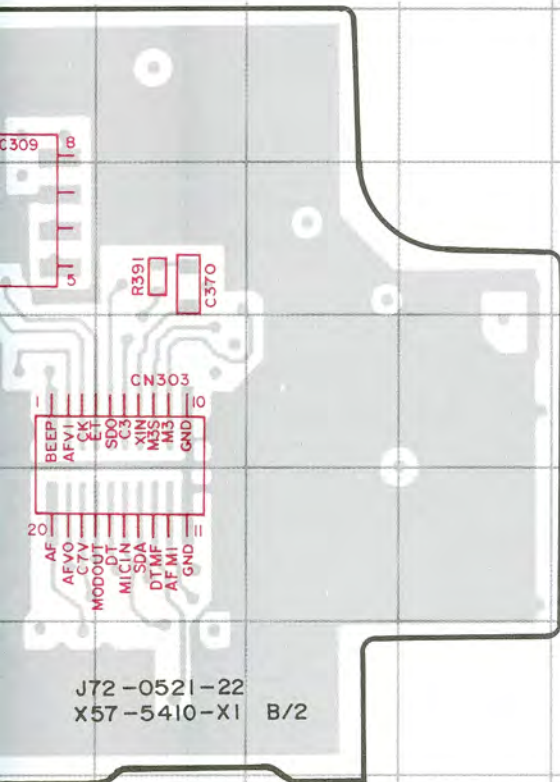
TX-RX UNIT (X57-5410-XX)
(B/2)(Component side)

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IC308	4D
IC311	6D
Q308	7D
Q309	7C
D325	4F

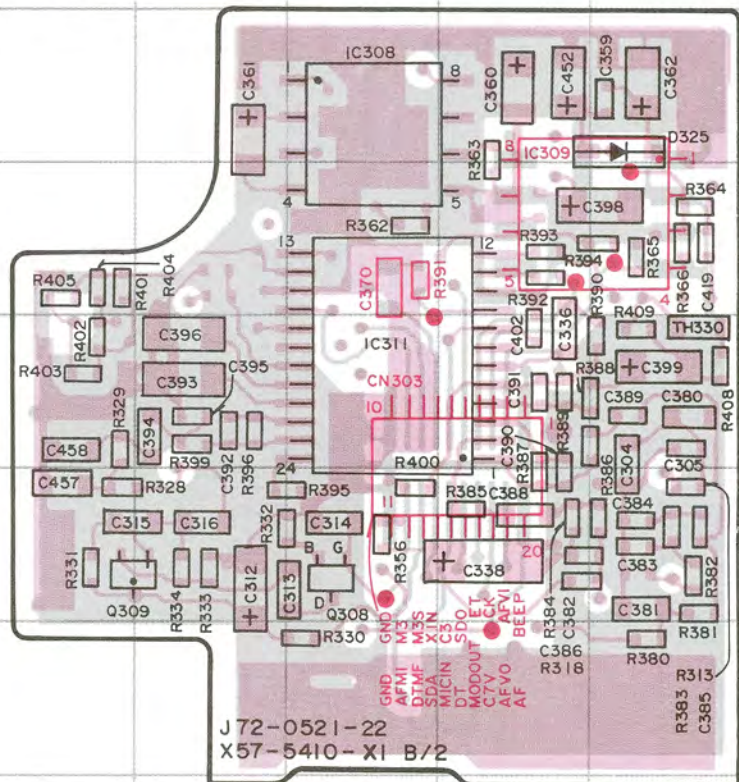


PC BOARD VIEWS TH-G71A/E

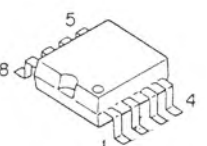
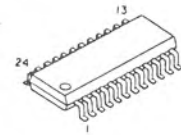
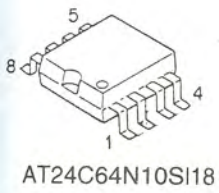
(X57-5410-XX)(B/2) Foil Side View
:T,E,E3,M2,M3,M4



TX-RX UNIT(X57-5410-XX)(B/2)
Component Side View+Foil Side View
-11:K,K2,-21:T,E,E3,M2,M3,M4



● Connect 1 and 6



Component side



Foil side

TX-RX UNIT (X57-5410-XX)
(B/2)(Foil side)

Ref.NO.	Address
IC309	5I

TX-RX UNIT (X57-5410-XX)
(B/2)(Component side) + (Foil side)

Ref.NO.	Address
IC308	4P
IC309	5Q
IC311	6P
Q308	7P
Q309	7O
D325	4R

Component side

- Pattern1
- Pattern2
- Pattern3
- Pattern4
- Pattern5
- Pattern6



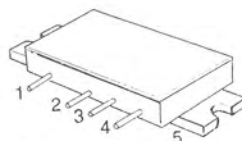
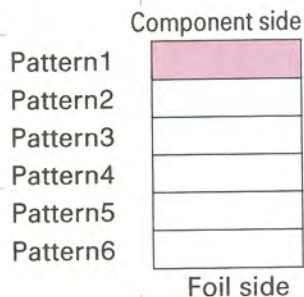
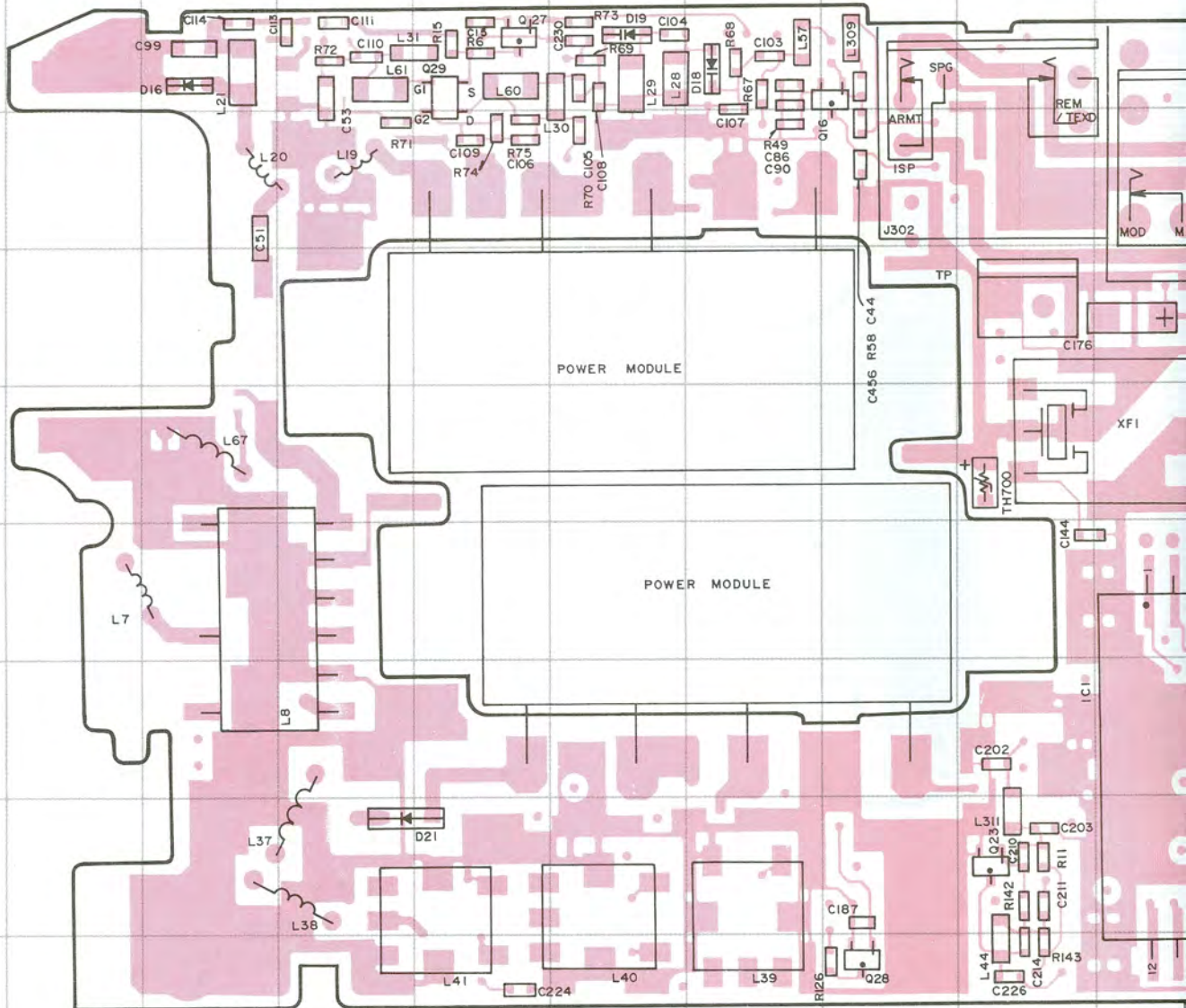
Foil side

TH-G71A/E PC BOARD VIEWS

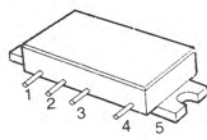
TX-RX UNIT (X57-5410-XX)(A/2) Component Side View -11:K,K2,-21:T,E,E3,M2,M3,M4

TX-RX UNIT (X57-5410-XX)
(A/2)(Component side)

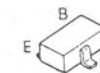
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IC100	6F
IC101	4E
IC305	6Q
IC312	5O
Q1	7N
Q2	8N
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Q23	9J
Q27	3F
Q28	10I
Q29	3F
Q30	6N
Q300	6R
Q306	7Q
Q307	6P
Q310	3P
Q312	5P
Q313	6P
Q314	9R
Q315	8Q
Q321	3Q
Q322	6R
Q323	3O
Q324	4O
Q325	6O
Q326	7Q
Q327	7Q
Q328	8P
D1	7N
D2	8N
D16	3D
D18	3H
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D319	4P
D320	5P
D322	4Q
D324	6Q
D326	7R



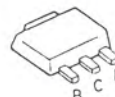
M67799MA



M67798LRA



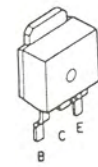
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DTC144EE
2SC4617
2SC5108



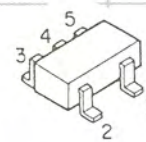
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2SD1483



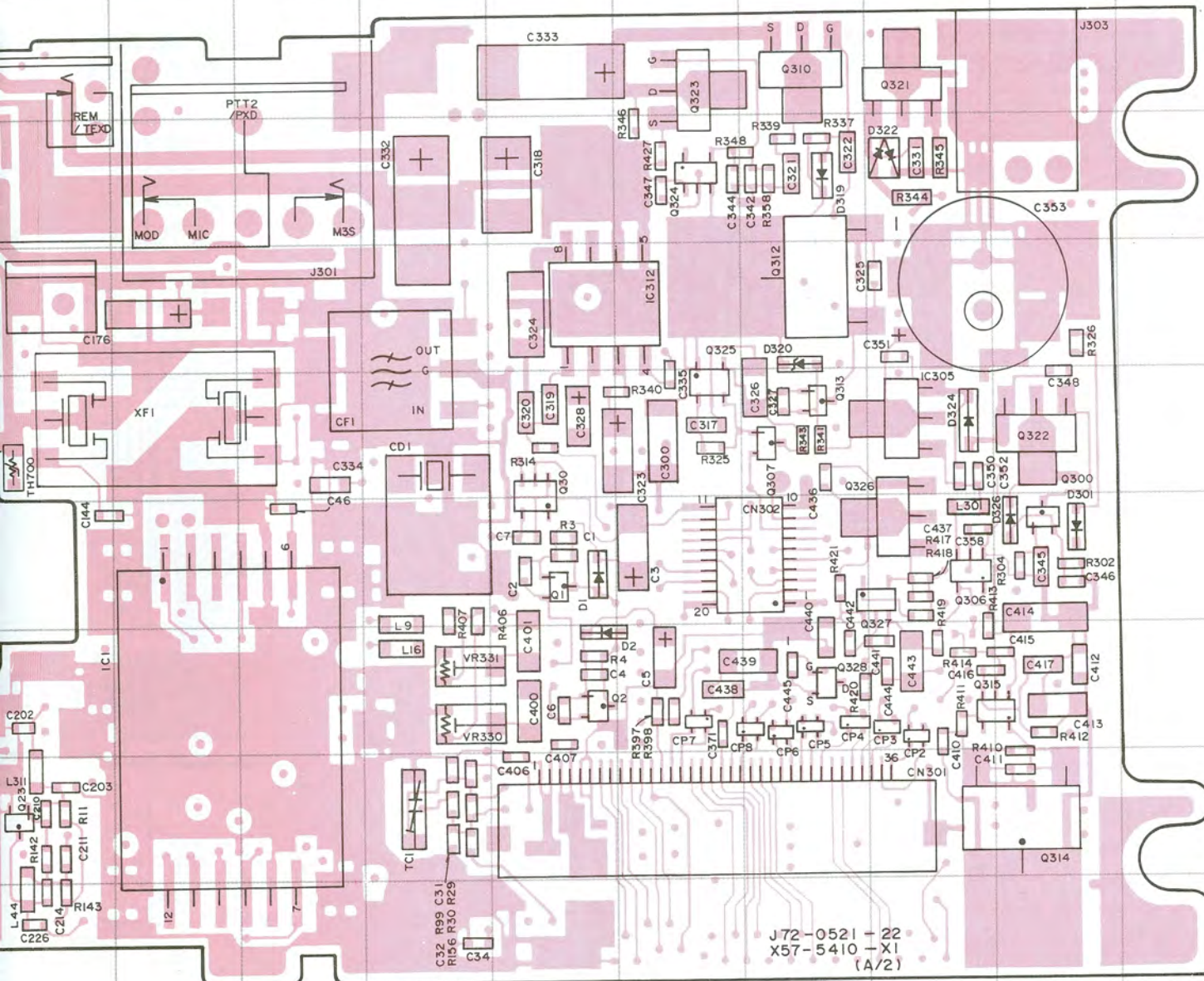
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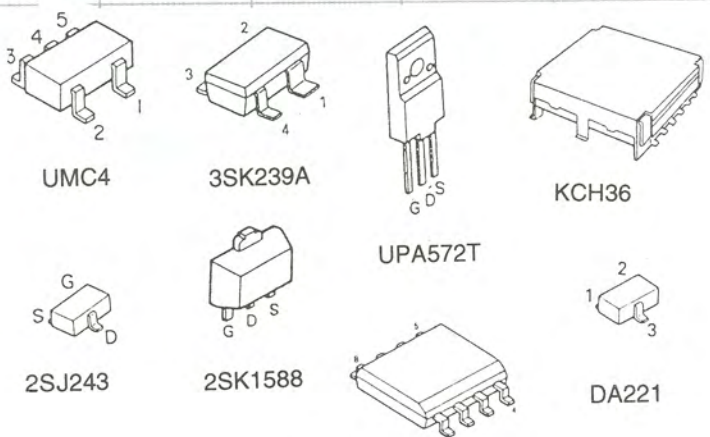
UMC4



2SJ243



J72-0521-22
X57-5410-X1
(A/2)



UMC4

3SK239A

KCH36

UPA572T

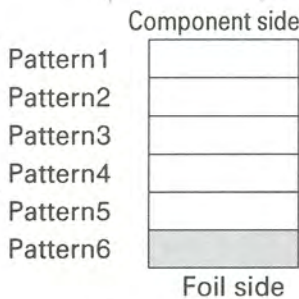
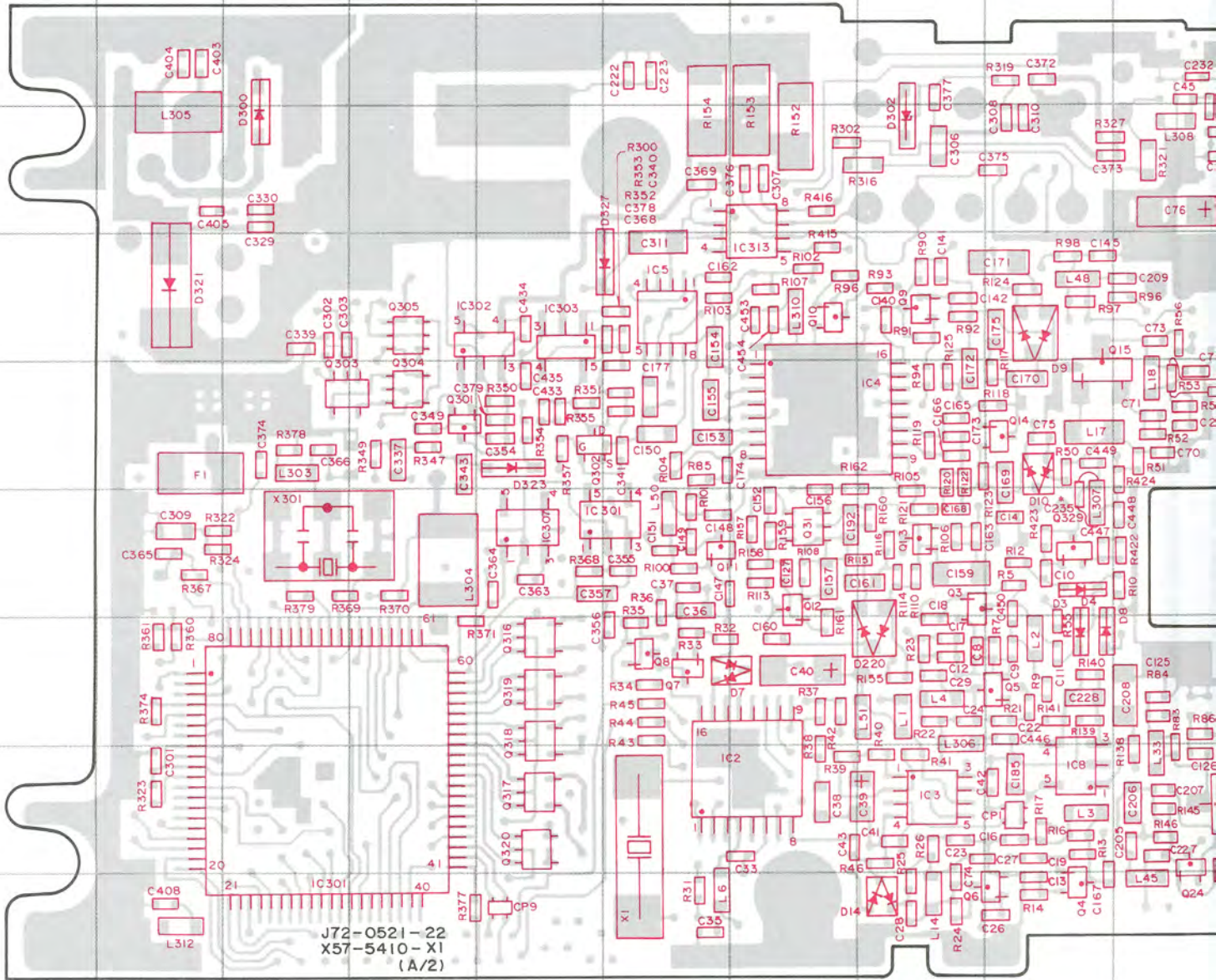
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2SK1588

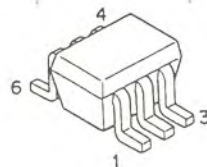
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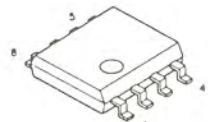
TX-RX UNIT (X57-5410-XX) (A/2)Foil Side View
-11:K,K2,-21:T,E,E3,M2,M3,M4



- 2SA1832
- 2SC3356
- 2SC4617
- 2SC4738
- 2SC5108



- UMA10N
- UMA11N



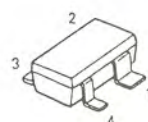
- TC4W53FU



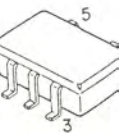
- UPA672T



- 2SK1824

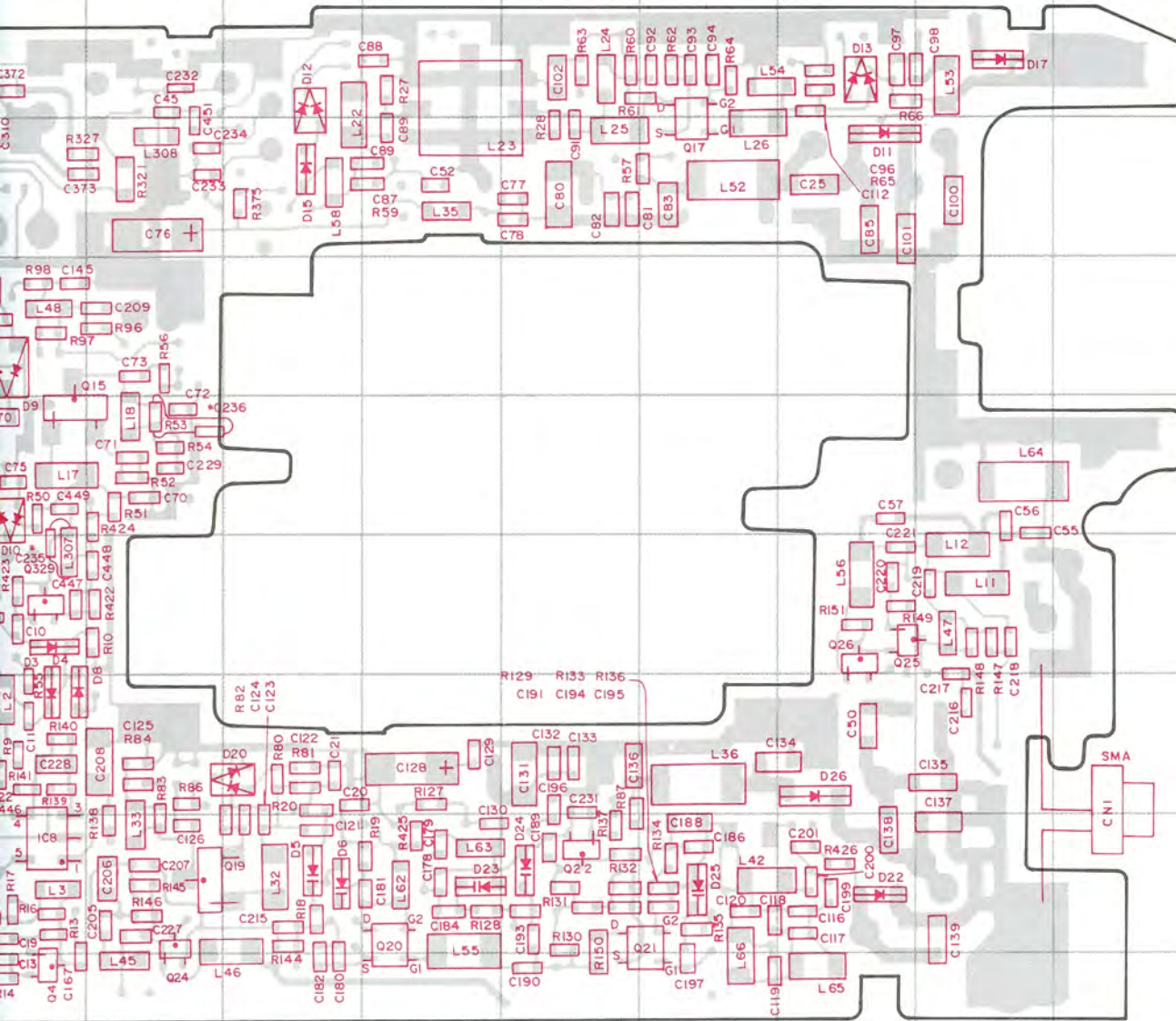


- 3SK239A



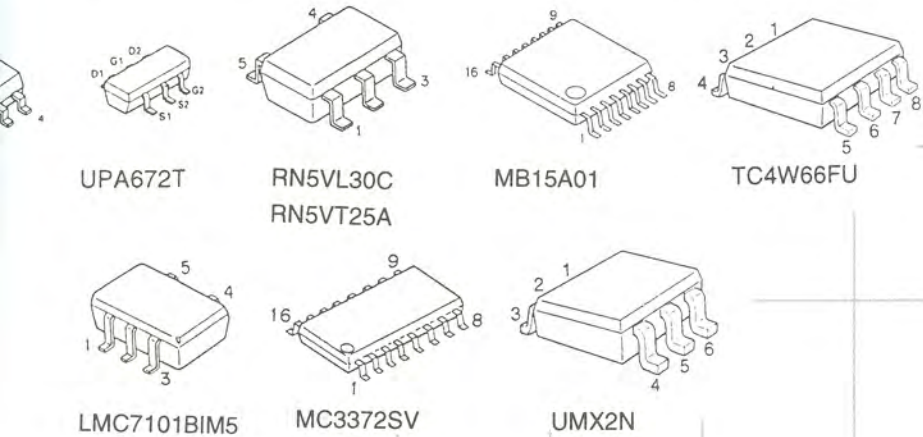
- LMC7101BIM

PC BOARD VIEWS TH-G71A/E



TX-RX UNIT (X57-5410-XX)
(A/2)(Foil side)

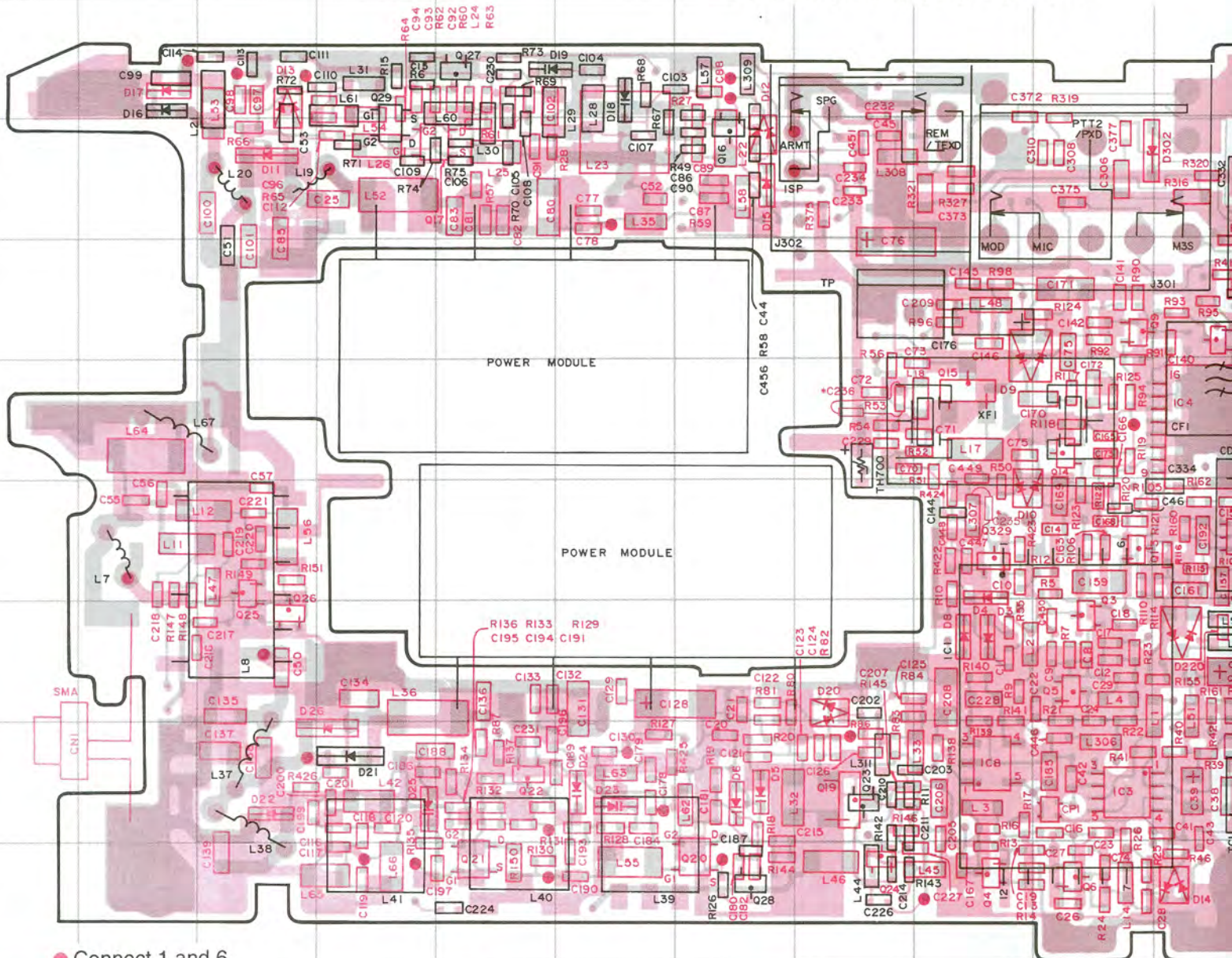
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IC3	9H
IC4	6G
IC5	5F
IC8	9I
IC301	9C
IC302	5E
IC303	5E
IC306	7F
IC307	7E
IC313	4G
Q3	7H
Q4	10I
Q5	8I
Q6	10I
Q7	8F
Q8	8F
Q9	5H
Q10	5G
Q11	7F
Q12	7G
Q13	7H
Q14	6I
Q15	6I
Q17	4N
Q19	9J
Q20	9L
Q21	10N
Q22	9M
Q24	10J
Q25	7O
Q26	7O
Q31	7G
Q301	6D
Q302	6E
Q303	6C
Q304	6D
Q305	5D
Q316	8E
Q317	9E
Q318	8E
Q319	8E
Q320	9E
Q329	7I
D3	7I
D4	8I
D5	9K
D6	9K
D7	8F
D8	8I
D9	5I
D10	6I
D11	4O
D12	3K
D13	3O
D14	10H
D15	4K



D17	3P
D20	8K
D22	9O
D23	9L
D24	9M
D25	9N
D26	8O
D220	8H
D300	4C
D302	4H
D321	5B
D323	6E
D327	5E

TH-G71A/E PC BOARD VIEWS

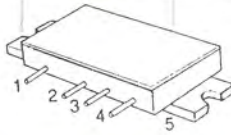
TX-RX UNIT(X57-5410-XX)(A/2) Component
-11:K,K2,-21:T,E,E3,M2,M3,M4



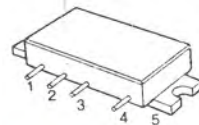
● Connect 1 and 6

Component side	Component side	Component side	Component side	Component side	Component side
Pattern1					
Pattern2	2SB1188	UMC4	DA221	2SK1588	LMC7101BIM5
Pattern3					
Pattern4	2SD1483	UMA10N	2SJ243	UPA572T	RN5VL30C
Pattern5					
Pattern6	2SB1184	UMA11N	2SK1824	UPA672T	RN5VT25A
Foil side					
	DTA114YE	TC4W53FU	3SK239A	KIA6278F	AK2343
	DTC144EE				
	2SA1832				
	2SC3356				
	2SC4617				
	2SC4738				
	2SC5108				

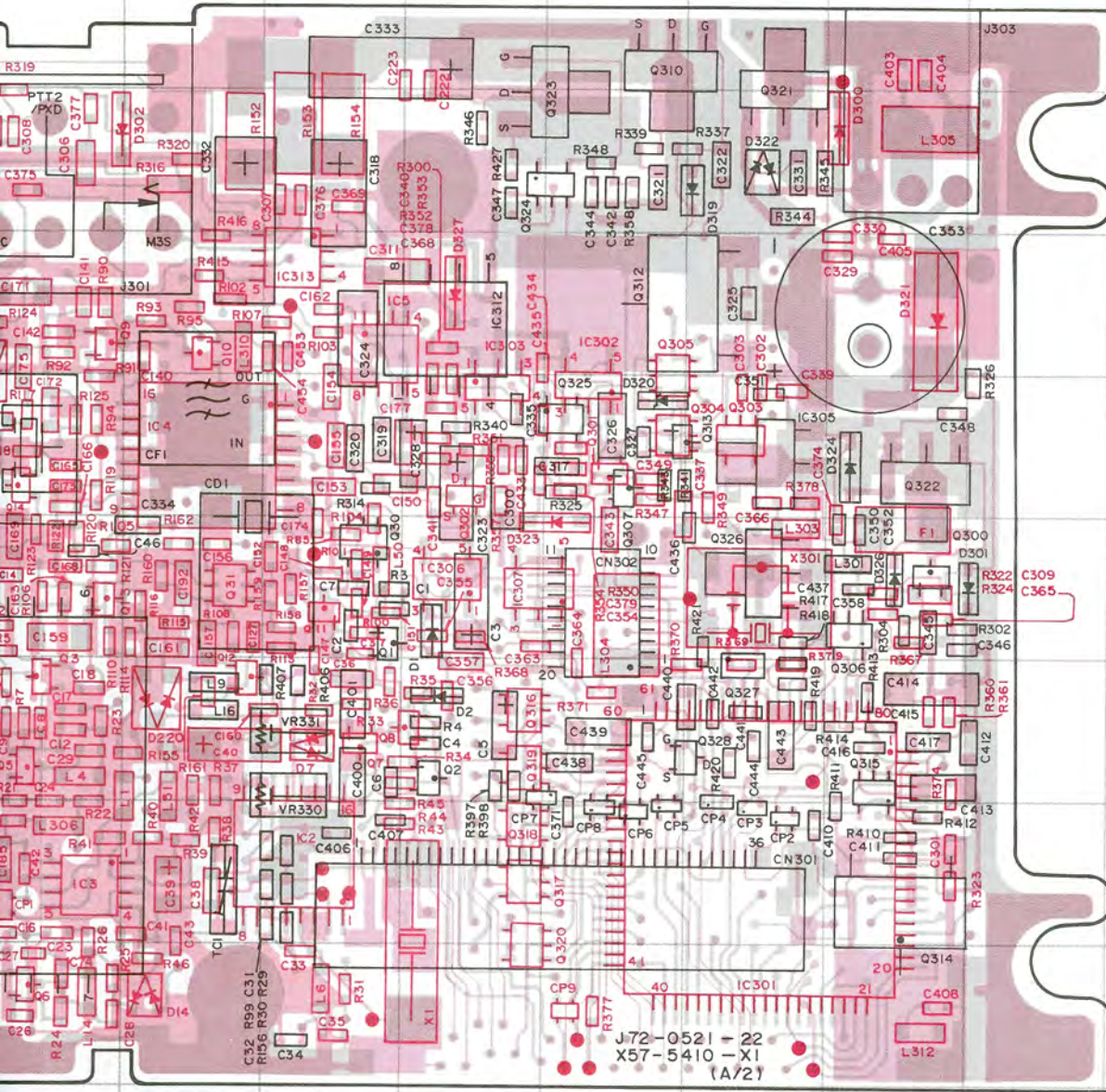
(A/2) Component Side View + Foil Side View
M4



M67799MA



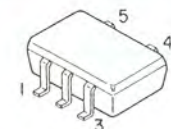
M67798LRA



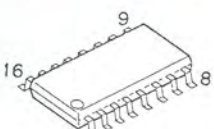
J72-0521-22
X57-5410-X1
(A/2)

TX-RX UNIT (X57-5410-XX)
(A/2)(Component side) + (Foil side)

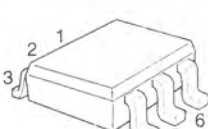
Ref.NO.	Address
IC1	7I
IC2	8L
IC3	8J
IC4	5K
IC5	4L
IC8	8I
IC100	6F
IC101	4E
IC301	9O
IC302	4N
IC303	5M
IC305	5O
IC306	6M
IC307	6M
IC312	4M
IC313	4L
Q1	6L
Q2	7M
Q3	7J
Q4	9I
Q5	7J
Q6	9J
Q7	7L
Q8	7M
Q9	4J
Q10	4K
Q11	6L
Q12	7K
Q13	6J
Q14	5J
Q15	5I
Q16	3G
Q17	3E
Q19	8H
Q20	9G
Q21	9E
Q22	8E
Q23	8H
Q24	9H
Q25	6C
Q26	7C
Q27	2E
Q28	9G
Q29	2D
Q30	6L
Q31	6K
Q300	6P
Q301	5N
Q302	5M
Q303	5O
Q304	5N
Q305	4N
Q306	6P
Q307	6N
Q310	2N
Q312	4N
Q313	5N
Q314	8P
Q315	7P
Q316	7M
Q317	8M
Q318	8M
Q319	7M
Q320	9M
Q321	2O
Q322	5P
Q323	3M



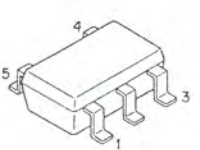
LMC7101BIM5



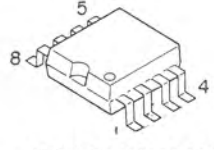
MC3372SV



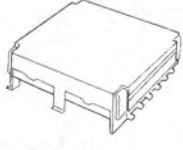
UMX2N



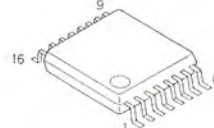
RN5VL30C
RN5VT25A



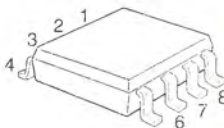
AT24C64N10SI18



KCH36



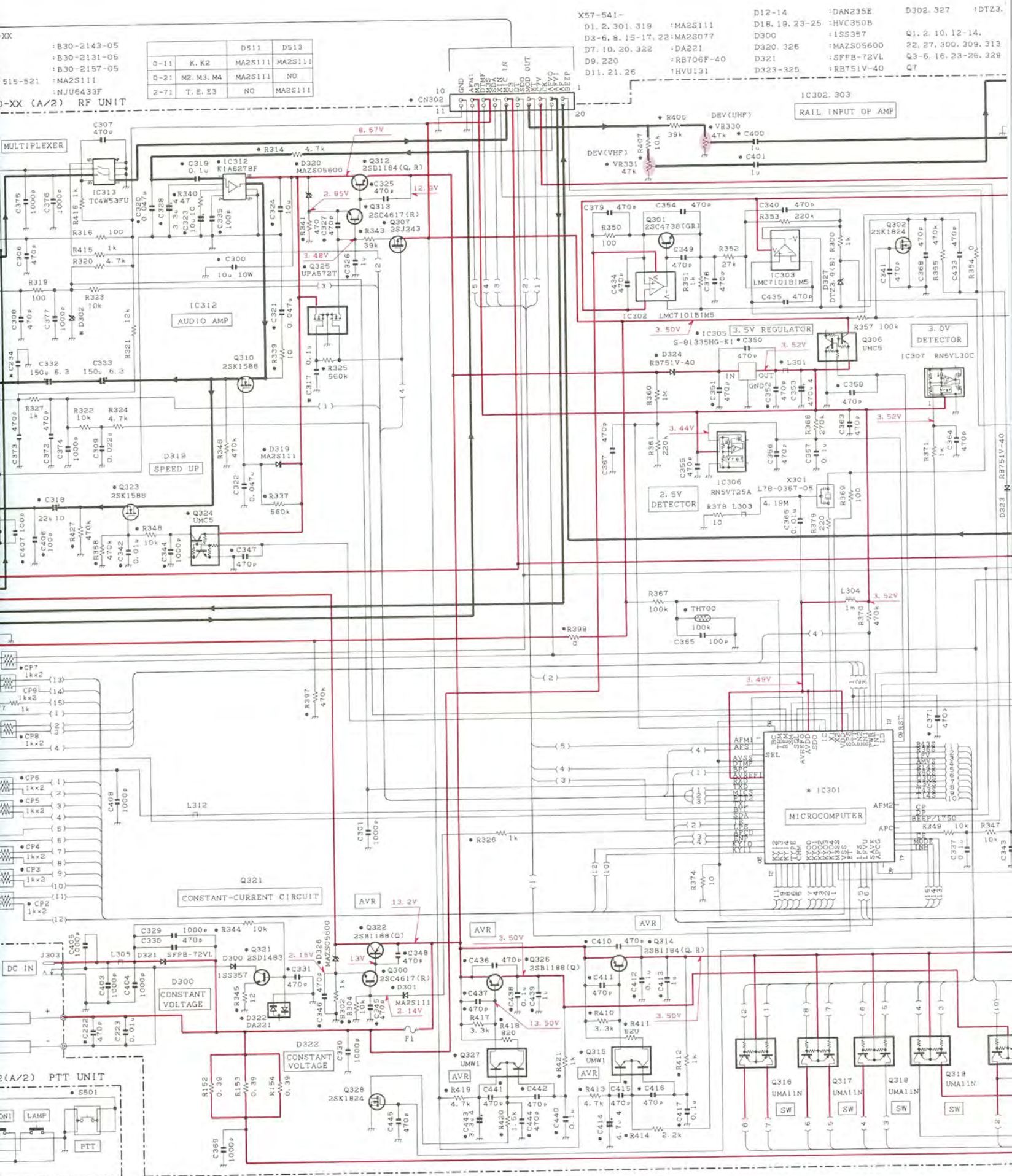
MB15A01



TC4W66FU

D17	2B
D18	2F
D19	2E
D20	7H
D21	8D
D22	8C
D23	8F
D24	8F
D25	8D
D26	8D
D220	7K
D300	3P
D301	6P
D302	3K
D319	3O
D320	5N
D321	4P
D322	3O
D323	6N
D324	5P
D326	6P
D327	4M

Q324	3M
Q325	5N
Q326	6O
Q327	7O
Q328	7O
Q329	6I
D1	6M
D2	7M
D3	7I
D4	7I
D5	8G
D6	8G
D7	7L
D8	7I
D9	5I
D10	6I
D11	3C
D12	3G
D13	2C
D14	9K
D15	3G
D16	2B



	D511	D513
0-11	K. K2	MA2S111
0-21	M2, M3, M4	MA2S111
2-71	T. E. E3	NO

X57-541	D12-14	D302.327	DTZ3.
D1. 2. 301. 319	D18. 19. 23-25	DAN295E	
D3-6. 8. 15-17. 22	D300	HVC350B	
D7. 10. 20. 322	D320 326	ISS357	Q1. 2. 10. 12-14.
D9. 220	D321	MAZS05600	22. 27. 300. 309. 313
D11. 21. 26	D323-325	SFPB-72VL	Q3-6. 16. 23-26. 329
		RB751V-40	QT

515-521 :B30-2143-05
 :B30-2131-05
 :B30-2157-05
 :MA2S111
 :NJU6433F

0-XX (A/2) RF UNIT

MULTIPLEXER

IC312
AUDIO AMP

D319
SPEED UP

Q321
CONSTANT-CURRENT CIRCUIT

D300
CONSTANT VOLTAGE

D322
CONSTANT VOLTAGE

0-XX (A/2) PTT UNIT

LAMP

PTT

IC302. 303
RAIL INPUT OP AMP

IC302 LMC7101BIMS
 IC303 LMC7101BIMS
 IC306 L78-0367-05
 IC307 RNS5V130C

3.5V REGULATOR
 S-81335HG-K1
 RB751V-40
 3.52V
 Q306 UMC5
 3.0V DETECTOR

2.5V DETECTOR
 R378 L303
 4.18M
 3.52V

TH700
 C365 100p
 3.49V

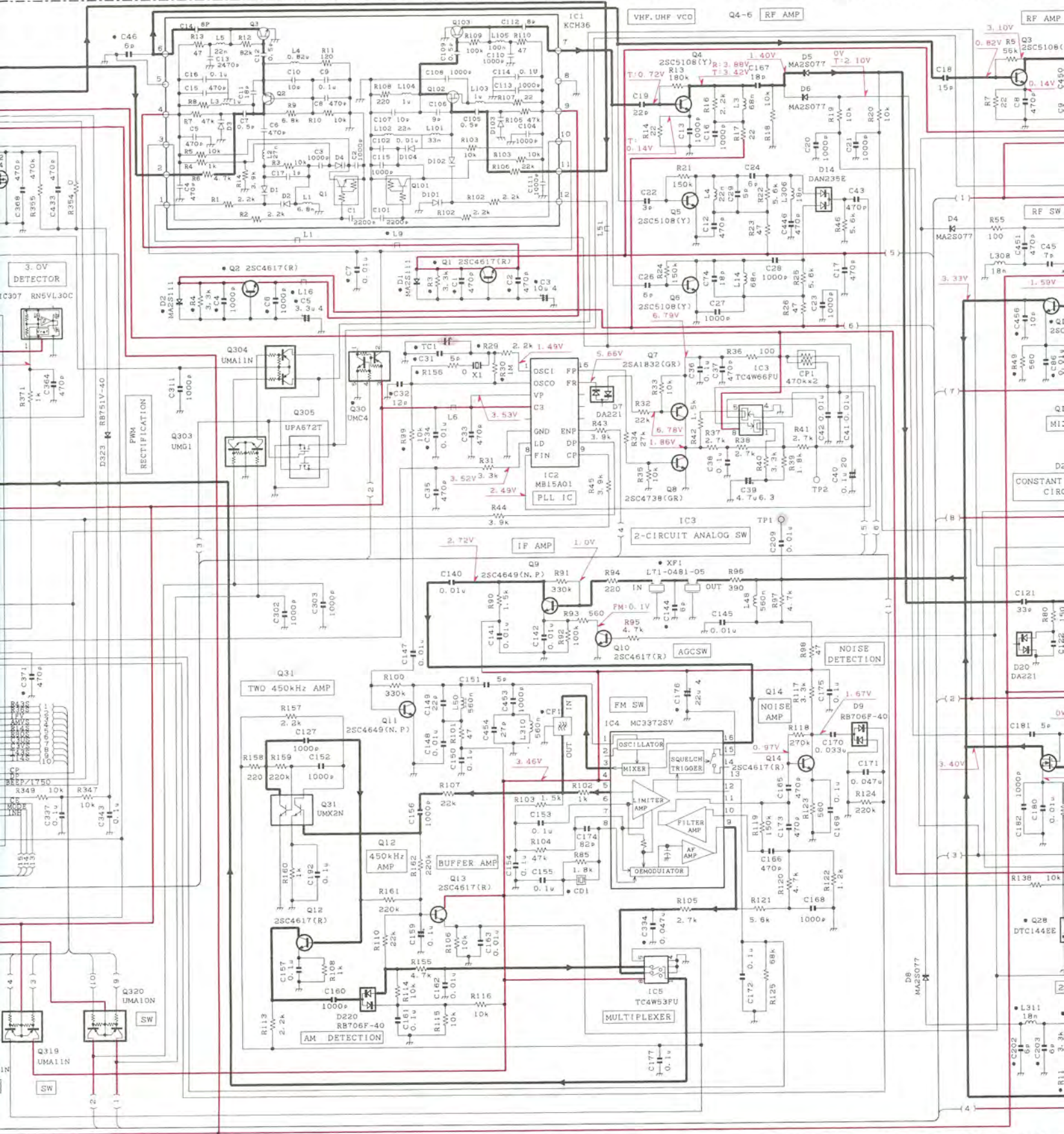
IC301
MICROCOMPUTER

AVR 13.2V
 AVR 3.50V
 AVR 3.50V
 AVR 3.50V

Q316 UMA11N SW
 Q317 UMA11N SW
 Q318 UMA11N SW
 Q319 UMA11N SW

Note) • Ref.NO : Parts of patten1.

D302, 327 :DTZ3-9(B)	Q8, 301 :2SC4738(GR)	Q31 :UMX2N	Q307 :2SJ243	Q322, 326 :2SB1188(Q)	IC3 :TC4W66FU	IC301 :
Q1, 2, 10, 12-14.	Q8, 11 :2SC4649(N.P)	Q302, 308, 328 :2SK1824	Q310, 323 :2SK1588	Q324 :UMC5	IC4 :MC3372SV	IC301 :
22, 27, 300, 309, 313 :2SC4617(R)	Q15, 19 :2SC3356	Q303 :UMG1	Q312, 314 :2SB1184(Q, R)	Q325 :UPA572T	IC5 :TC4W53FU	IC302, 303 :
Q3-6, 16, 23-26, 329 :2SC5108(Y)	Q17, 20, 21, 29 :3SK239A	Q304, 316-319 :UMA11N	Q315, 327 :UMU1	IC1 :KCH36	IC8 :TA75S01F	IC305 :
Q7 :2SA1832(GR)	Q28 :DTC144EE	Q305 :UPA672T	Q320 :UMA10N	IC2 :MB15A01	IC100 :M67798LRA	IC306 :
	Q30 :UMC4	Q306 :UMC5	Q321 :2SD1483		IC101 :M67799MA	IC307 :

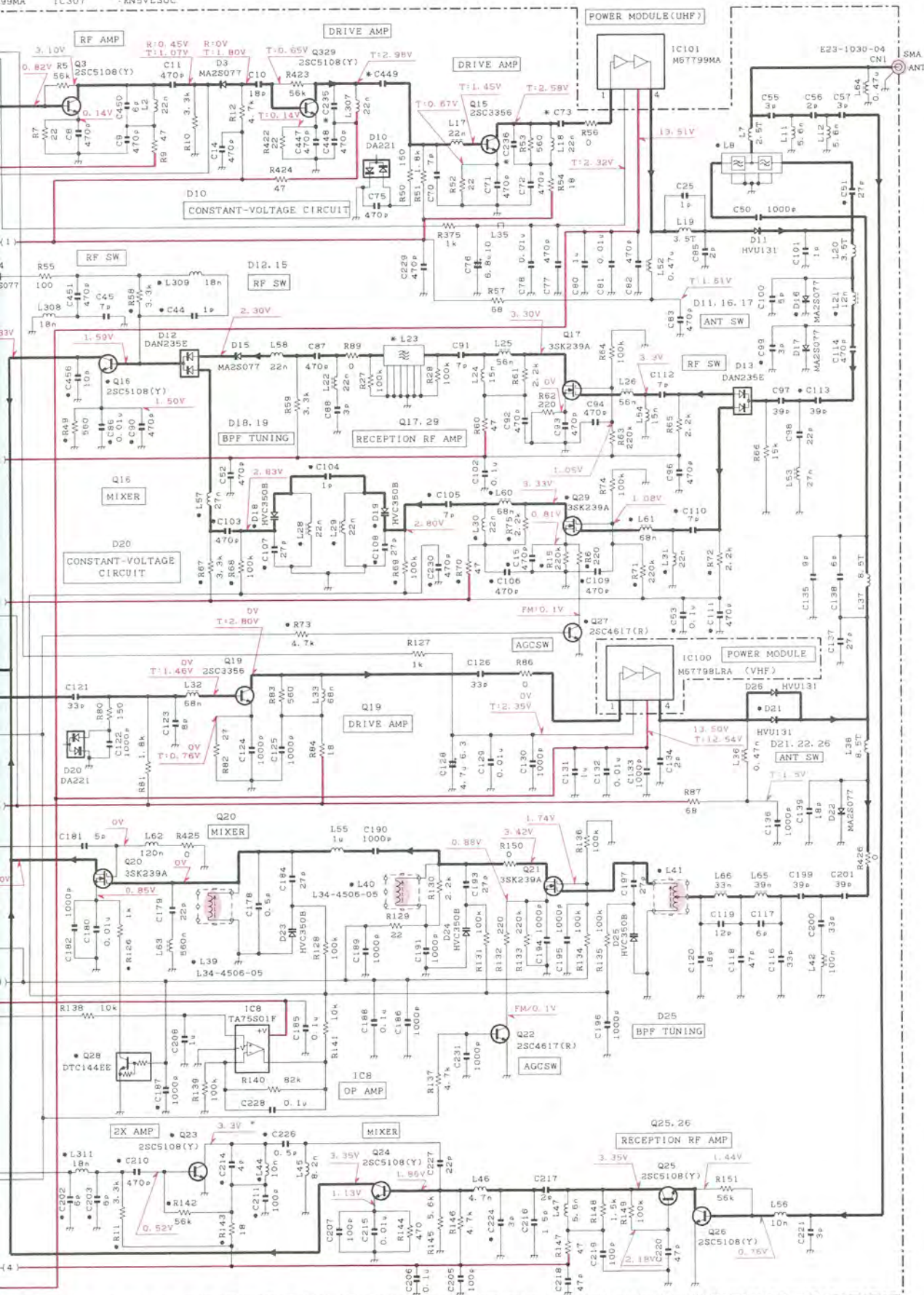


SCHEMATIC DIAGRAM TH-G71A/E

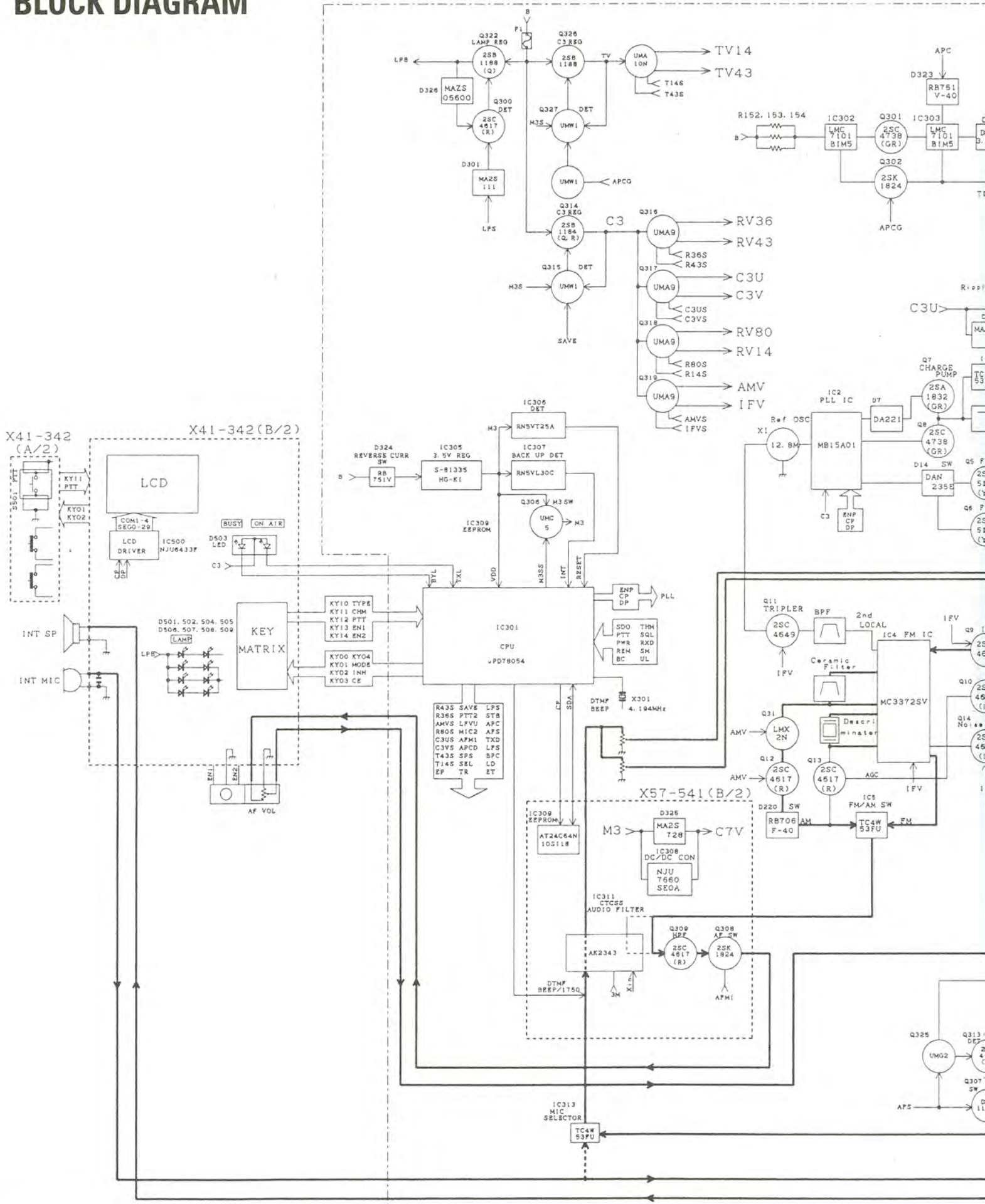
Item 1.

66FU	IC301	:UPD78054GK-538(0-11)	IC308	:TC7660SE0A
72SV	IC301	:UPD78054GK-541(0-21)	IC309	:AT24C64N10S11B
53FU	IC302, 303	:LMC7101B1M5	IC311	:AK2343
801F	IC305	:S-81335HG-KI	IC312	:KIA6278F
98LRA	IC306	:RN5VT25A	IC313	:TC4WS3FU
99MA	IC307	:RN5VL30C		

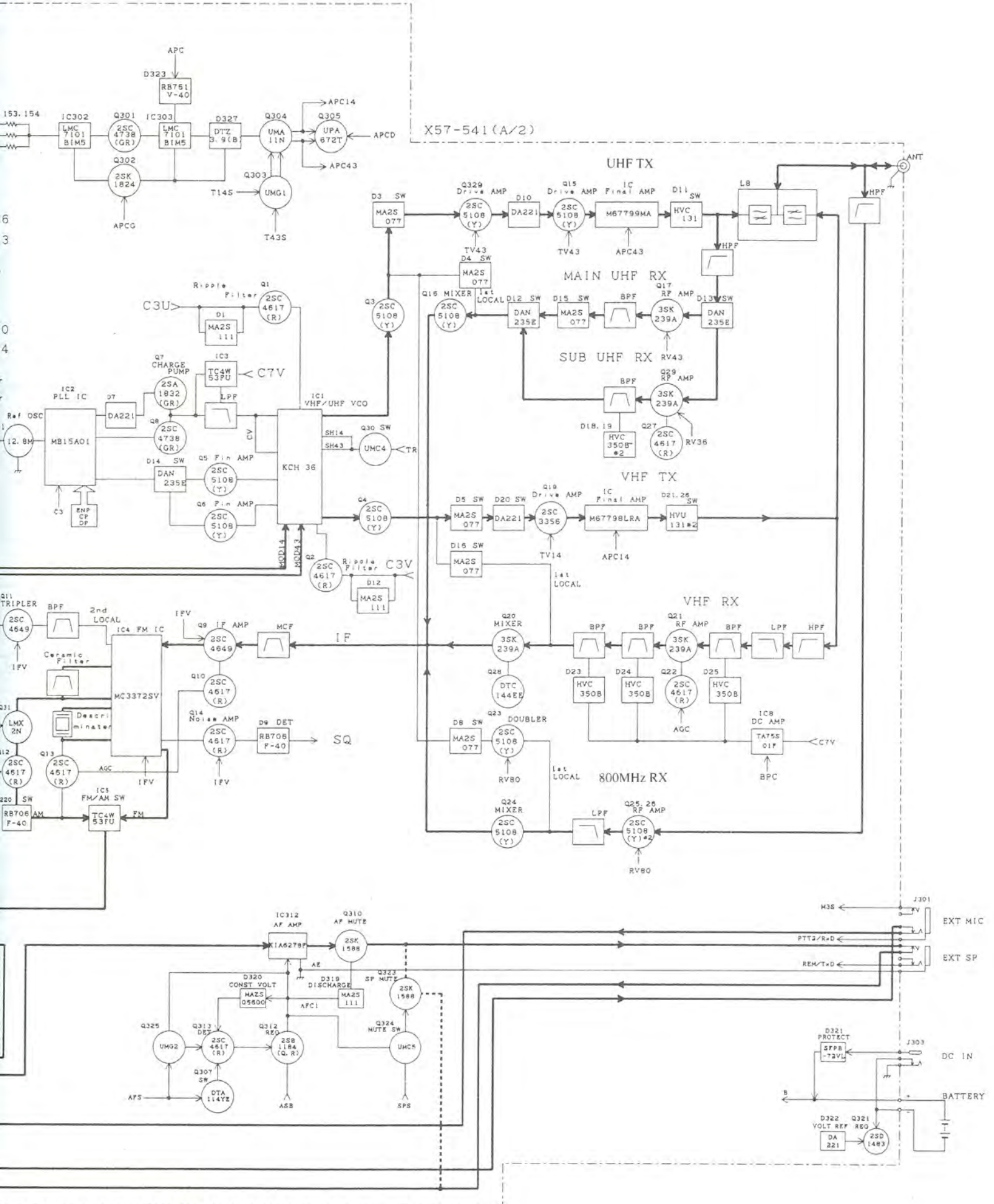
0-11	K, K2	IC301	L23	D302	C73	C232-234	C235	C236	C449
0-21	T, E, E3, M2, M3, M4	UPD78054GK-538	L79-1493-05	NO	15p	NO	NO	NO	5e
		UPD78054GK-541	L79-1492-05	DTZ3-9(B)	470p	100p	5p	7p	NO

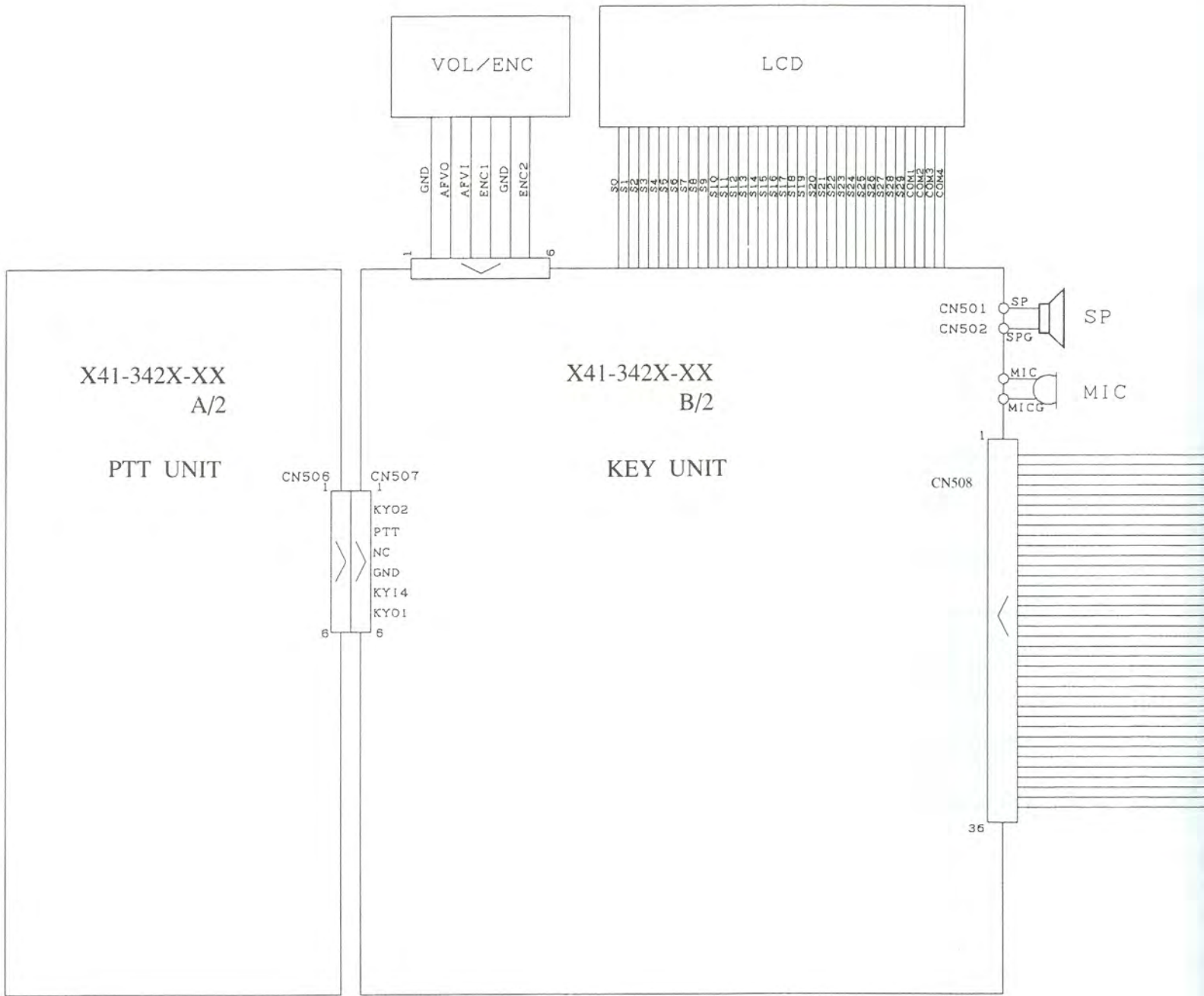


BLOCK DIAGRAM



A/E TH-G71A/E

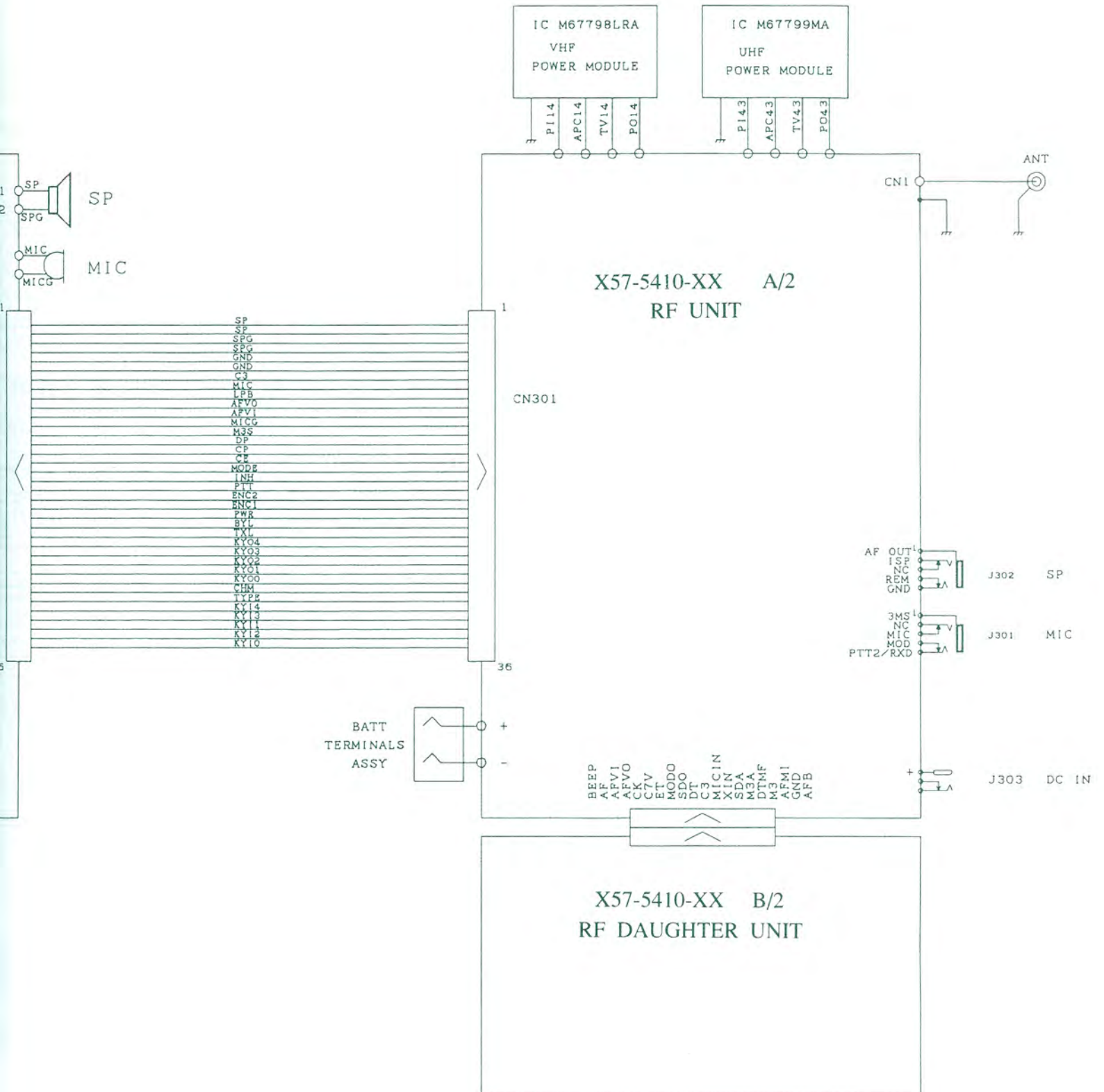




Model Name	Destination Symbol	Destinations	TX-RX Unit	SWITCH Unit
TH-G71A	K	USA	X57-5410-11	X41-3420-11
TH-G71A	K2	USA	X57-5410-11	X41-3420-11
TH-G71A	M2	General market	X57-5410-21	X41-3420-21
TH-G71A	M3	General market	X57-5410-21	X41-3420-21
TH-G71A	M4	General market	X57-5410-21	X41-3420-21
TH-G71E	E	Germany Italy	X57-5410-21	X41-3422-71
TH-G71E	E3	Belgium Holland Spain France	X57-5410-21	X41-3422-71
TH-G71E	T	England	X57-5410-21	X41-3422-71

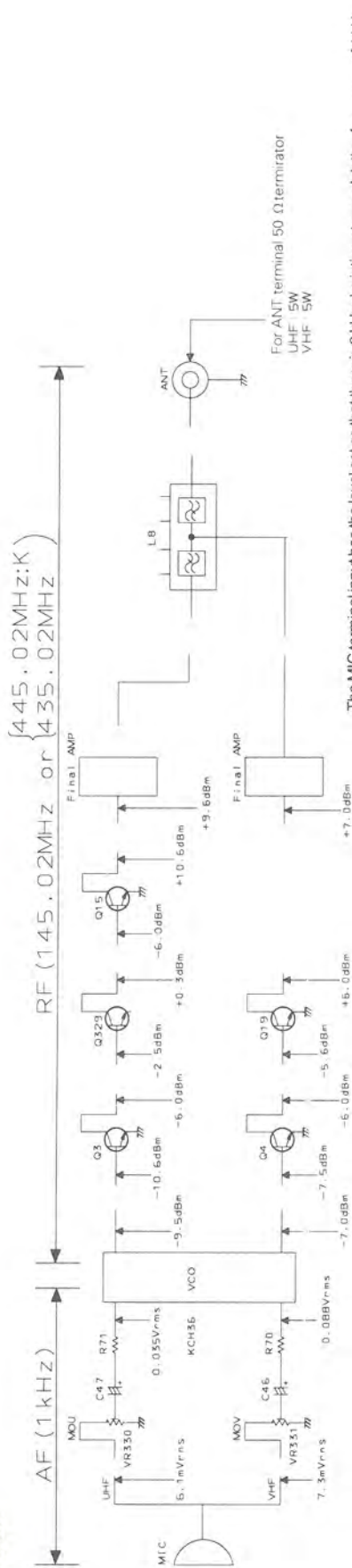
E TH-G71A/E

WIRING DIAGRAM



LEVEL DIAGRAM

TX Section



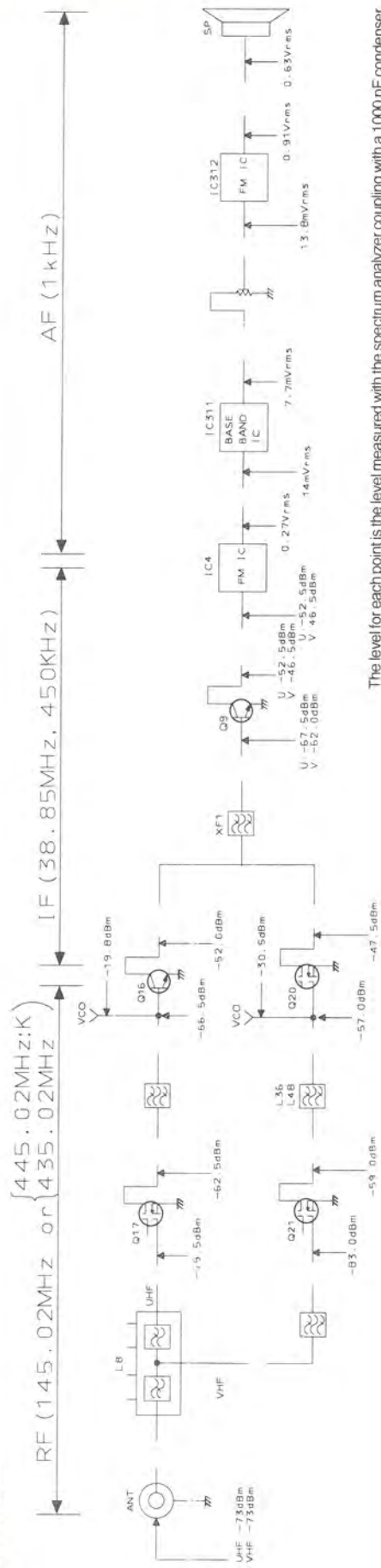
The MIC terminal input has the level set so that there is 3 kHz deviation at a modulation frequency of 1 kHz. The level for each point is the level measured with the spectrum analyzer coupling with a 1000 pF condenser.

AF is the level measured directly with the AF VTVM.

The level for each point is the level measured without cutting the pattern or removing parts.

The level for each transistor is the level when the terminals are measured directly with a 1000 pF condenser.

RX Section



The level for each point is the level measured with the spectrum analyzer coupling with a 1000 pF condenser. AF is the level measured directly with the AF VTVM.

The AF level is the level when the AF output is adjusted to 0.63 VRMS with AF VOL (S1).

The level for each point is the level measured without cutting the pattern or removing parts.

The level for each transistor is the level when the terminals are measured directly with a 1000 pF condenser.

TERMINAL FUNCTION

Connector No.	Pin No.	Pin name	Function
CN301, CN508	1	SP	Internal speaker audio
	2	SP	Internal speaker audio
	3	SPG	Audio ground
	4	SPG	Audio ground
	5	GND	GND
	6	GND	GND
	7	C3	Reception power supplies, PLL, VCO power supply
	8	MIC	Internal mic
	9	LPB	Lamp power supply
	10	AFVI	Reception volume IN audio
	11	AFVO	Reception volume OUT audio
	12	MICG	Mic ground
	13	M3S	Power supply with M3 switched
	14	DP	Data
	15	CP	Clock
	16	CE	LCD driver chip enable
	17	MODE	LCD driver mode setting
	18	INH	LCD driver display off input terminal
	19	PTT	PTT
	20	ENC2	Encoder 2
	21	ENC1	Encoder 1
	22	PWR	Power switch
	23	BYL	BUSY lamp control
	24	TXL	TX lamp control
	25	KYO4	Key matrix
	26	KYO3	Key matrix
	27	KYO2	Key matrix
	28	KYO1	Key matrix
	29	KYO0	Key matrix
	30	CHM	Key lock channel display mode
	31	TYPE	Type
	32	KY14	Key matrix
	33	KY13	Key matrix
	34	KY11	Key matrix
	35	KY12	Key matrix
	36	KY10	Key matrix

Connector No.	Pin No.	Pin name	Function
CN302, CN303	1	BEEP	BEEP
	2	AFVI	Reception volume In audio
	3	CK	Clock
	4	ET	AK2343 tone squelch enable
	5	SDO	AK2343 tone detection
	6	C3	AK2343 audio filter power supply
	7	XIN	4.194 MHz for AK2343
	8	M3S	Power supply with M3 switched
	9	M3	Microcomputer, EEPROM power supply
	10	GND	GND
	11	GND	GND
	12	AFM1	Audio mute (before volume)
	13	DTMF	DTMF
	14	SDA	EEPROM serial data
	15	MICIN	Mic input
	16	DT	AK2343 data
	17	MODOUT	Modulation output
	18	C7V	7V DC/DC comparator output
	19	AFVO	Reception volume OUT audio
	20	AF	Reception detection output

BC-19 RAPID CHARGER



■ Specifications

Charging current	700mA±70mA (PB-38), 450mA±45mA (PB-39)
Charging time (Minute)	60±30% (PB-38), 90±30% (PB-39)
Source voltage	15V±10% or more
Terminal voltage (Open) ...	17.3V±0.8V
Ambient temperature	5°C~40°C
Dimensions	105 (W)×135 (D)×55 (H) (mm)
Weight	0.16kg

1. Power supply section

- 1) The power supply generates constant current (700mA or 450mA) from the input voltage (rated 15V DC) from the adapter.
- 2) IC3 is a DC/DC converter.
- 3) R26 is a resistor for current detection.
- 4) R24, R52 and R25 are resistors for no-load voltage detection.
- 5) IC2 is a power supply IC for the microcomputer (IC1).

2. Charging control section

- 1) The microcomputer (IC1) controls following.
 - Peak detection
 - Temperature control
 - Detection of abnormality, such as a short terminal
 - LED control
 - Trickle charging
 - Timer control
- 2) IC4 resets the microcomputer.
- 3) X1 is an oscillator that generates clocks for the microcomputer.

3. Charging switch section

- 1) Q1 is a transistor that turns quick charging on and off.
- 2) Q2 is a transistor that turns trickle charging on and off.
- 3) The resistor (R6) determines the trickle current.

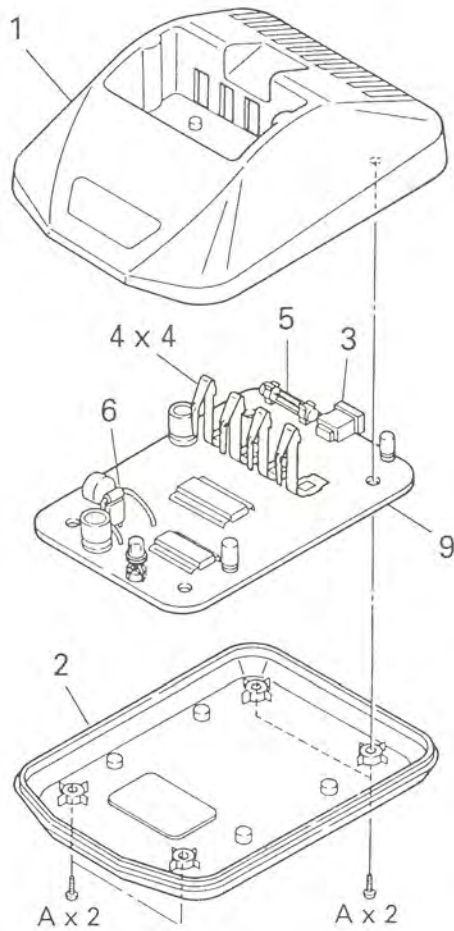
4. Display section

- 1) LED1 is a two-color LED that indicates the charging state.
- 2) Red ON Quick charging
Green ON Charging is complete
Red Blinking Abnormal (short terminal, short battery, or open T terminal)

A/E TH-G71A/E

BC-19 RAPID CHARGER

■ Exploded view



■ Parts List

* New parts

Ref.No.	New parts	Parts No.	Description	Desti-nation	
1	*	A02-2082-08	Case (Upper)		
2	*	A02-2083-08	Case (Lower)		
3		E03-0187-08	Jack		
4		E23-1039-08	Terminal		
△	△	5	* F53-0149-08	Fuse (2A)	
△		6	* F09-0460-08	Thermal fuse	
A		N80-2610-45	Pan head tapping screw		
△	△	9	* W02-1928-08	Circrit module	
△			W08-0477-05	AC adapter (120V/60Hz)	K
△			W08-0478-05	AC adapter (230V/50Hz)	E

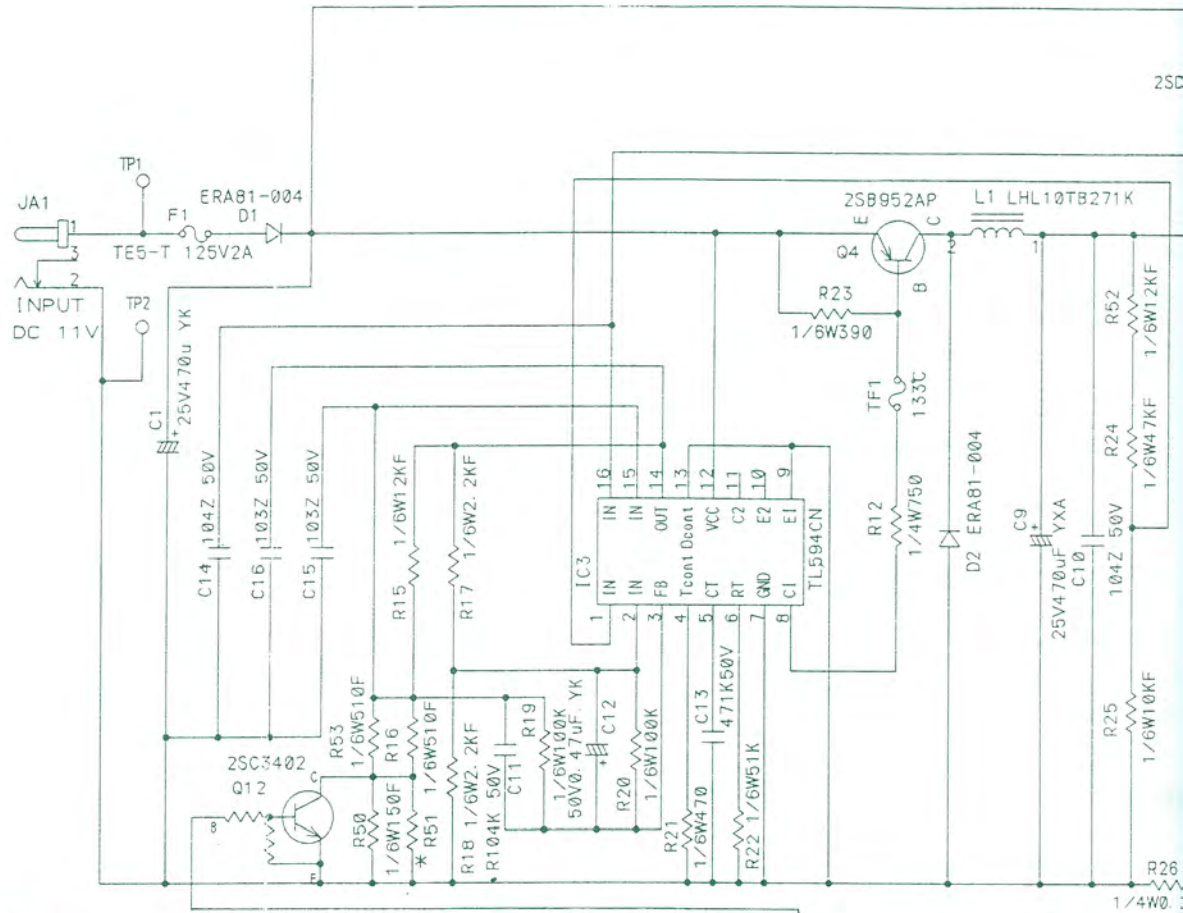
△ indicates safety critical components

PB-39)

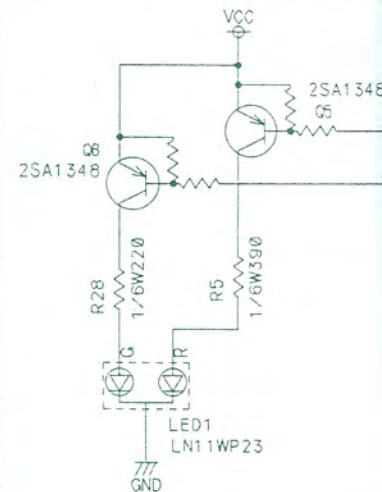
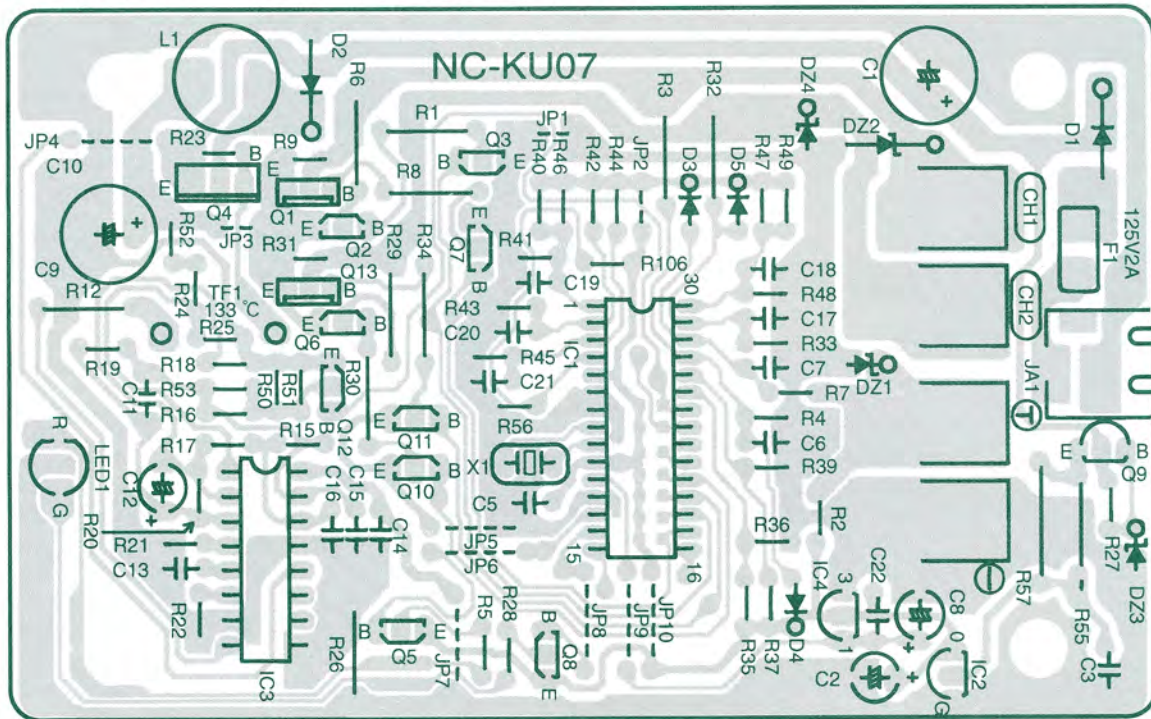
off.
off.

state.

■ CIRCUIT DIAGRAM (W02-1928-08)



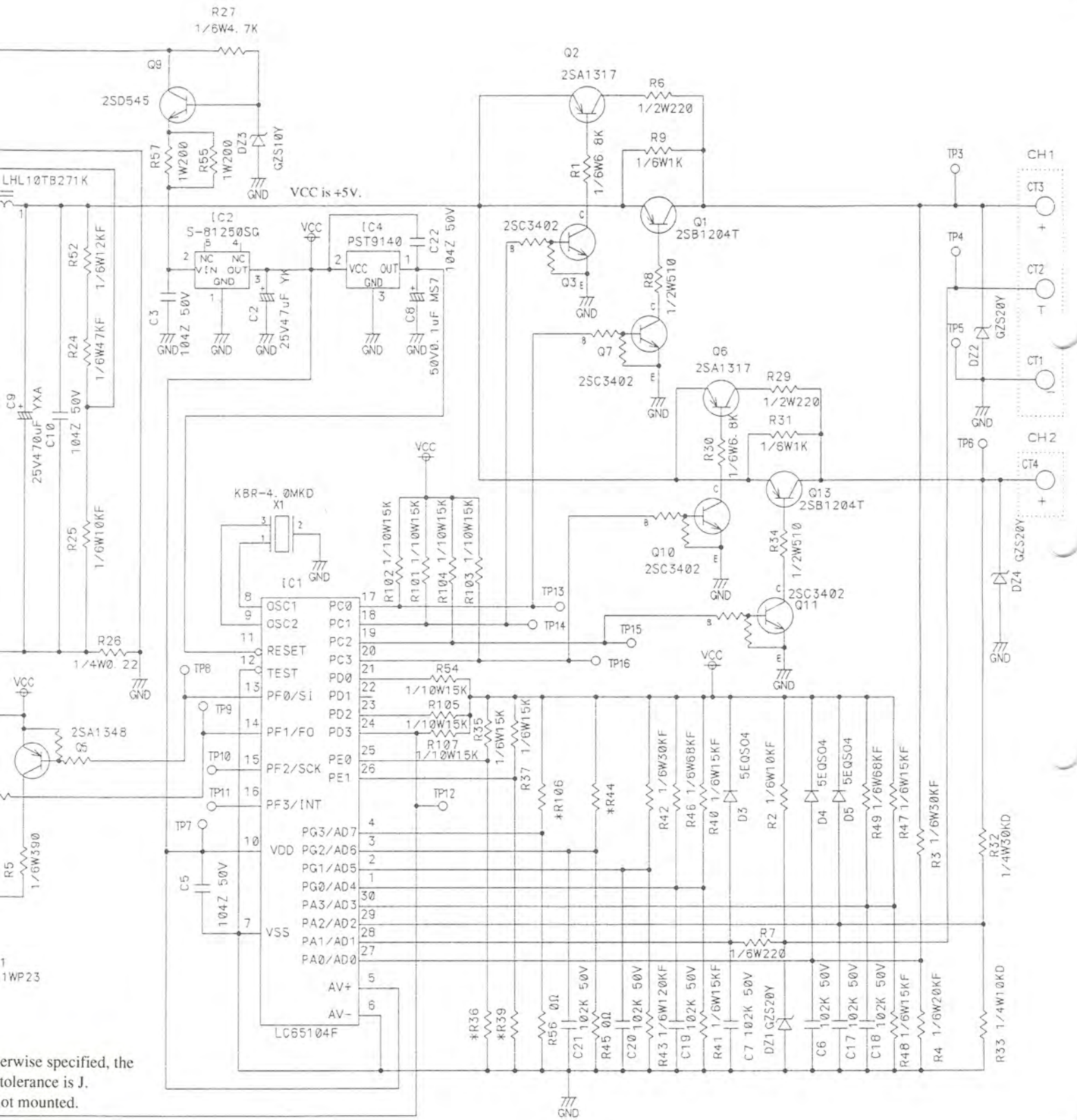
■ PC BOARD VIEW (W02-1928-08) Component side view



Note: Unless otherwise specified, the resistance tolerance is J.
* indicates not mounted.

TH-G71A/E

RAPID CHARGER



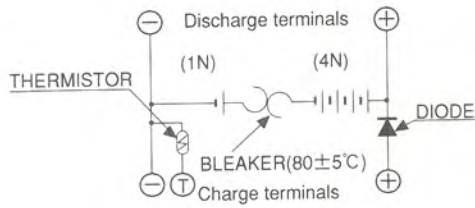
otherwise specified, the tolerance is J. not mounted.

PB-38 (STANDARD BATTERY BACK) / PB-39 (HIGH POWER BATTERY BACK) / SC-45(SOFT CASE) / BT-11(BATTERY CASE)

PB-38:External view (6.0V 650mAh)



Schematic diagram



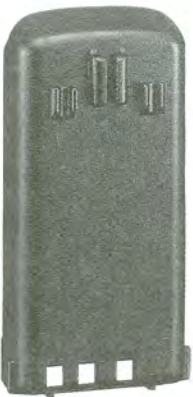
Main external shape dimensions and weight

Item	Unit	Main unit	
		A	B
Width (W)	mm	54	58
Depth (D)	mm	11.8	15.9
Height (H)	mm	112	112
Weight	g	About 145	

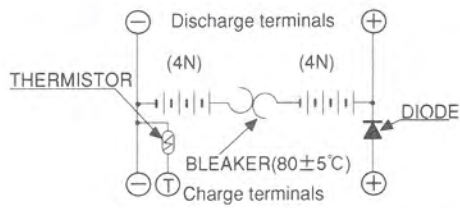
A: Dimensions not including projections

B:Dimensions including projections

PB-39:External view (9.6V 600mAh)



Schematic diagram



Main external shape dimensions and weight

Item	Unit	Main unit	
		A	B
Width (W)	mm	54	58
Depth (D)	mm	19.8	23.9
Height (H)	mm	112	112
Weight	g	About 183	

SC-45:External view



BT-11:External view (For 4 AA batteries)



SPECIFICATIONS

General		VHF Band	UHF Band
Frequency range	U.S.A./Canada	144 to 148 MHz	438 to 450 MHz
	General Market	144 to 148 MHz	430 to 440 MHz
	Europe	144 to 146 MHz	430 to 440 MHz
Mode		F3E(FM)	
Usable temperature range		-20°C to +60°C (-4 °F to +140 °F)	
Rated voltage	External power supply (DC IN)	5.5 to 16.0V (13.8V)	
	Battery terminals	4.5 to 15.0V (6.0V)	
Current	Receive with no signals	Approx. 70mA	
	Battery Saver ON	Average 30mA	
	Transmit with HI, 13.8V (DC IN)	Approx. 1.7A	Approx. 2.1A
	Transmit with HI, 9.6V (battery terminals)	Approx. 1.7A	Approx. 1.8A
	Transmit with HI, 6.0V (battery terminals)	Approx. 1.3A	Approx. 1.5A
	Transmit with LOW, 6.0V (battery terminals)	Approx. 500mA	
	Transmit with EL, 6.0V (battery terminals)	Approx. 300mA	
Ground method		Negative	
Dimensions (W × H × D, projections included) ¹		54 × 112 × 33.5mm / 2.13 × 4.41 × 1.32in	
Weight ^{1,2}		Approx. 330g/11.6oz	
Microphone impedance		2k Ω	
Antenna impedance		50 Ω	
Transmitter		VHF Band	UHF Band
Power output	HI, 13.8V	6W	5.5W
	HI, 9.6V	Approx. 5W	
	HI, 6.0V	Approx. 2.5W	Approx. 2.2W
	LOW, 6.0V	Approx. 0.5W	
	EL, 6.0V	Approx. 50mW	
Modulation		Reactance	
Maximum frequency deviation		Within ± 5kHz	
Spurious emissions		-60dB or less	
Receiver		VHF Band	UHF Band
Circuitry		Double conversion superheterodyne	
1st intermediate frequency		38.85 MHz	
2nd intermediate frequency		450 kHz	
Sensitivity (12dB SINAD)		0.18 μV or less	
Squelch sensitivity		0.1 μV or less	
Selectivity (-6dB)		12kHz or more	
Selectivity (-40dB)		28kHz or less	
Audio output (10% distortion)	9.6V (battery terminals)	500mW or higher (8 Ω load)	
	6.0V (battery terminals)	300mW or higher (8 Ω load)	

¹ With a PB-38 installed

² PB-38, antenna, and belt hook included

Specifications are subject to change without notice due to advancements in technology.

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