ORDER NO. KM49406836C1
F1

Service Manual

and Technical Guide

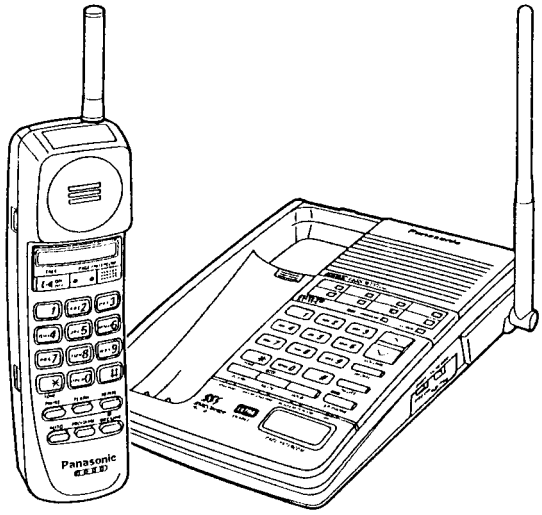
CORDLESSPHONE

SOUND CHARGER PLUS

Telephone Equipment

KX-T3970

(for U.S.A.)



(Model KX-T3970R) (Model KX-T3970H)

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Panasonic

■ SPECIFICATIONS

General

Modulation:	FM, 5 kHz Deviation
Frequency Stability:	±2.5 kHz
Dial Type:	Tone (DTMF)/Pulse
Redial:	Last dialed number each time the Redial button is pressed
Pause:	3.5 seconds per pause

	Base unit (KX-T3970H)	Portable handset (KX-T3970R)
Power Source:	AC adaptor KX-A11-5 (DC 12 V)	Built-in rechargeable Ni-Cd battery (KXA150)
(Receiver Section)		
Receiving frequency:	10 channel within 49.6 to 49.9 MHz	10 channel within 46.6 to 46.9 MHz
Adjacent Channel Rejection:	40 dB	40 dB
Sensitivity:	1 μV for 20 dB S/N	2 μV for 20 dB S/N
(Transmitter Section)		
Transmitting Frequency:	10 channel within 46.6 to 46.9 MHz	10 channel within 49.6 to 49.9 MHz
Jacks:	DC IN, Telephone Line	
Antenna:	Rubber Flexible	Rubber Flexible
Speaker:	2″ (5 cm) PM Dynamic	1 3/16″ (3 cm) ceramic type
Microphone:	Condenser Microphone	Condenser Microphone
Dimensions (H×W×D):	2 11/32″×6 11/16″×9 1/16″ (60×170×230 mm)	10″×2 3/16″×2″ (254×56×51 mm)
Weight:	1.4 lbs. (642 g) with battery	0.53 lbs. (242 g) with battery

Design and specifications are subject to change without notice.

DISASSEMBLY INSTRUCTIONS

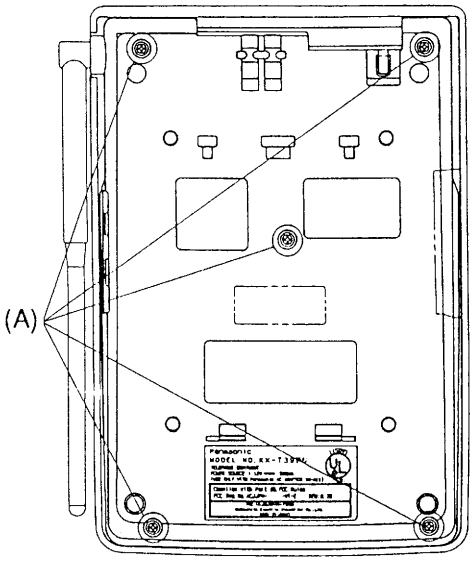


Fig. 5

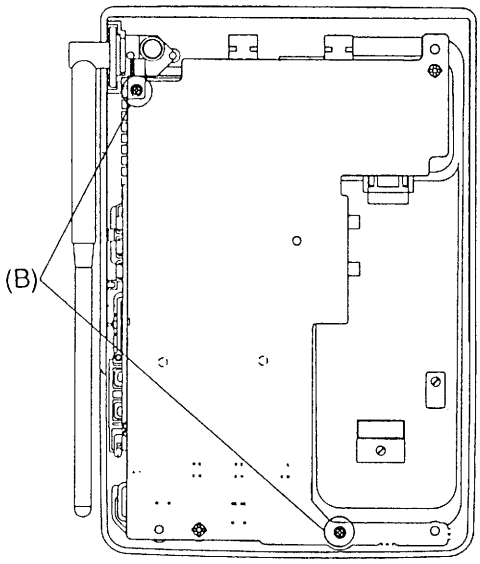


Fig. 6

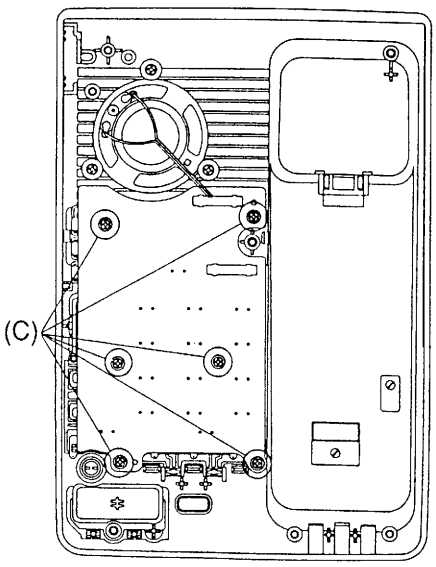


Fig. 7

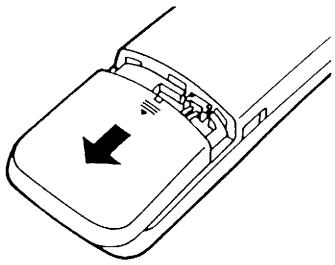


Fig. 8

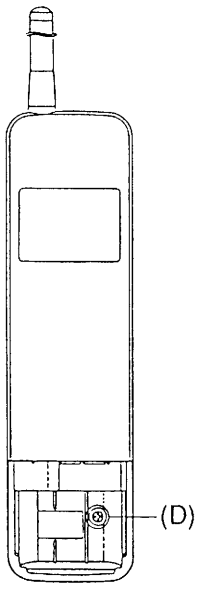


Fig. 9

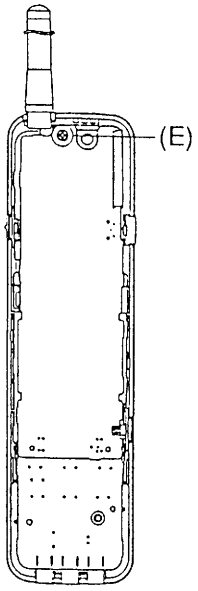


Fig. 10

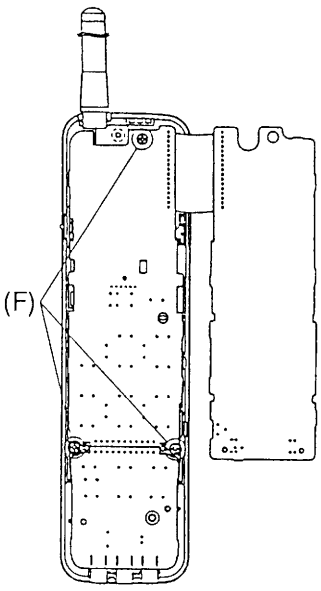


Fig. 11

Ref. No.	Procedure	Shown in Fig.—	To remove —.	Remove —.
1	1	5	Lower Cabinet	Screws (3×14) ..... (A)×5
2	1, 2	6	Main P.C. Board	Screws (3×10) ..... (B)×2
3	1~3	7	Operational P.C. Board	Screws (3×10) ..... (C)×6
4	4, 5	8	Rear Cabinet	Remove the battery compartment cover
5		9		Screw (2.6×12) ..... (D)×1
6	4~6	10	Printed Circuit Board	Screw (2.6×10) ..... (E)×1
7	4~7	11		Screws (2.6×10) ..... (F)×3

ADJUSTMENTS (KX-T3970H)

If your unit have below symptom, adjust for each item following table of adjustment.

Symptom	Remedy
The base unit does not receive a call from portable handset.	Adjust the adjustment item (A)
The base unit does not transmit, and the transmit frequency is slipped.	Adjust the adjustment item (B)
The transmit frequency is slipped.	Adjust the adjustment item (C)
The transmit output is low, and the arrival distance is shorted between base unit and portable handset.	Adjust the adjustment item (D)
The reception sensitivity of base unit is wrong, the noise is occurred.	Adjust the adjustment item (E)

Unit condition:

Remove the antenna from P.C. Board of the base unit.

How to set the test mode:

■ CH10 Test Mode

1. Set SW6 to OFF.
2. Connect the test mode diodes D1, D2.
3. Turn on SW6 while pressing the SP-Phone button and Hold button.
4. After 1 second, release the SP-Phone button and Hold button. (The unit becomes CH10 test mode.)
5. Every time the Mute button is pressed, the condition of test mode is changed as shown below.
   Standby→Talk→Intercom
6. After adjusting, remove the test mode diodes D1, D2, and set SW6 to OFF.
   (The unit will be released the test mode.)

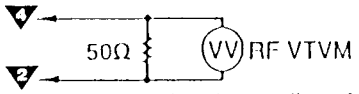
■ CH5 Test Mode

1. Set SW6 to OFF.
2. Connect the test mode diodes D1, D2.
3. Turn on SW6 while pressing the Mute button and Page/Intercom button.
4. After 1 second, release the Mute button and Page/Intercom button.
   (The unit becomes CH5 test mode.)
5. Every time the Mute button is pressed, the condition of test mode is changed as shown below.
   Standby→Talk→Intercom
6. After adjusting, remove the test mode diodes D1, D2, and set SW6 to OFF.
   (The unit will be released the test mode.)

When replacing these parts, adjust as shown below table.

Replace Parts	Adjustment Items	Test Mode	Adjustment Points	Procedure
IC1, T5	(A) Phase Detector Voltage Adjustment (RX)	CH10 Talk	T5	1. Connect the Digital Voltmeter to ▽-▽. 2. Adjust T5 (counterclockwise) so that the reading of the Digital Voltmeter is 2.1 V±0.1 V.

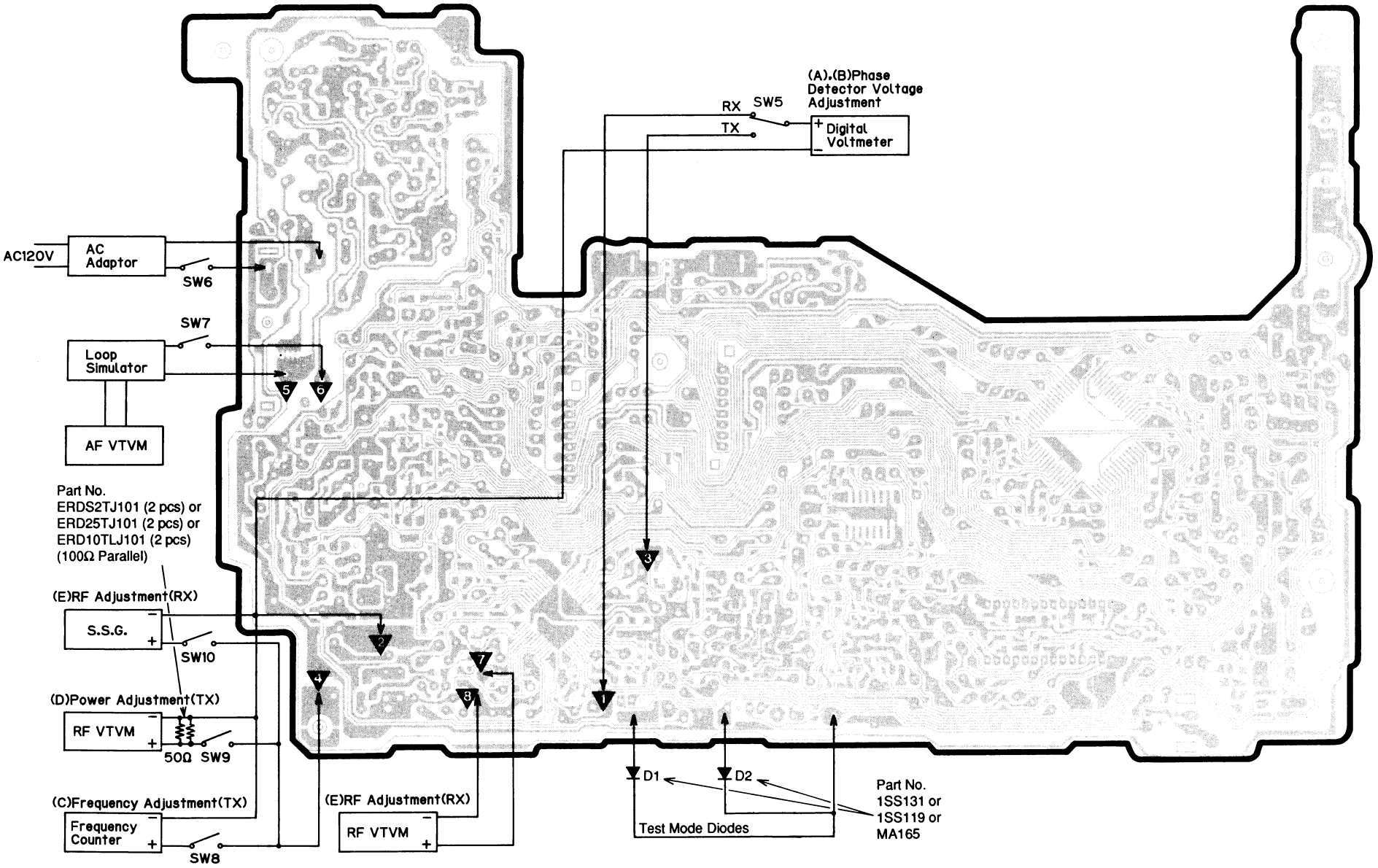
When replacing these parts, adjust as shown below table.

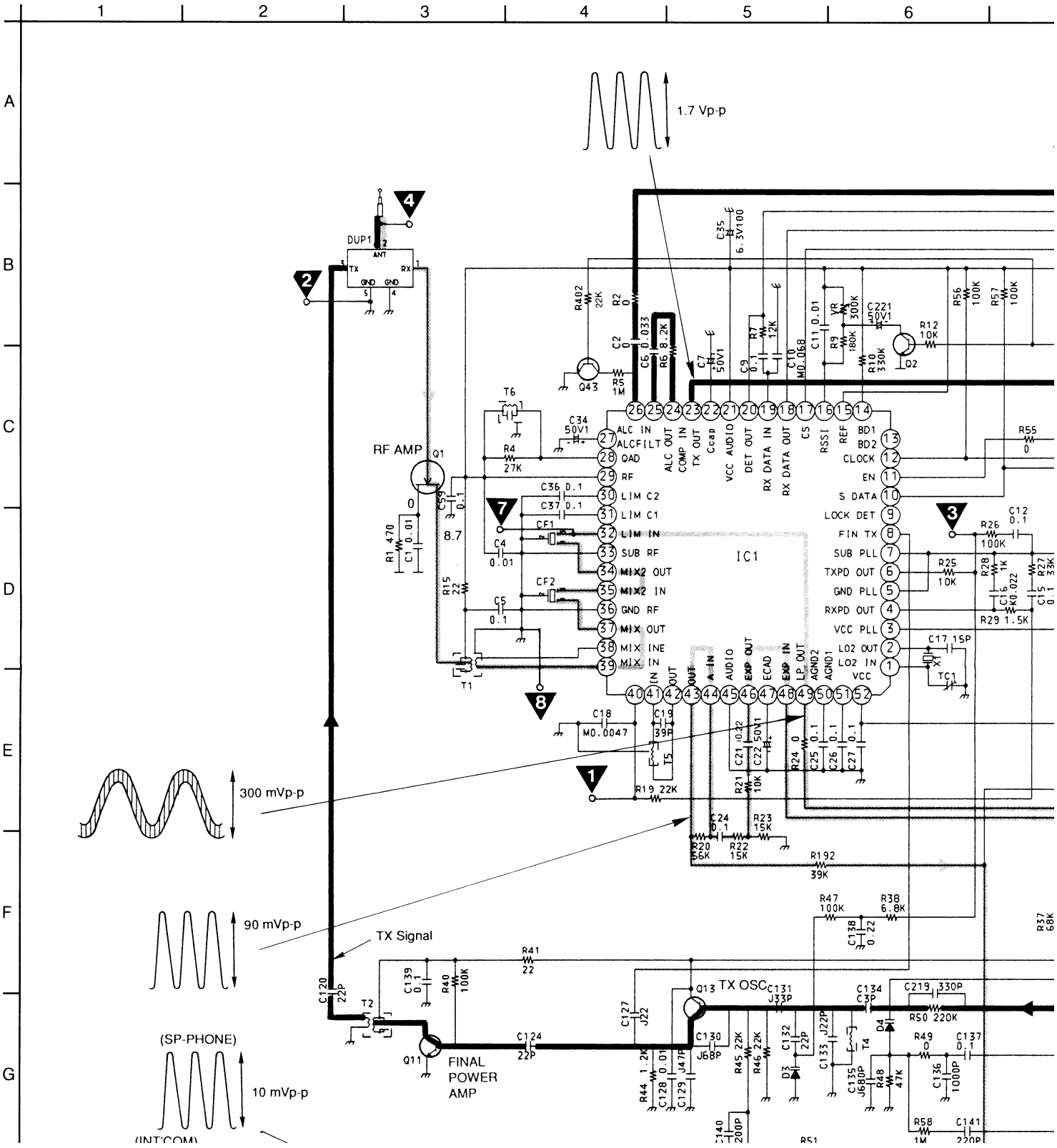
Replace Parts	Adjustment Items	Test Mode	Adjustment Points	Procedure
D3, D4, T4	(B) Phase Detector Voltage Adjustment (TX)	CH10 Talk	T4	1. Connect the Digital Voltmeter to ▼3–▼2. 2. Adjust T4 (counterclockwise) so that the reading of the Digital Voltmeter is 2.0 V±0.1 V.
DUP1, T2, TC1, X1	(C) Frequency Adjustment (TX)	CH10 Talk	TC1	1. Connect the frequency counter to ▼4–▼2. 2. Adjust **TC1** so that the reading of the frequency counter is 46.971 MHz±300 Hz.
T2, Q11	(D) Power Adjustment (TX)	CH10 Talk	T2	1. Connect the RF VTVM (connect 50Ω resistor) to ▼4–▼2.  2. Adjust T2 (clockwise) so that the reading of the RF VTVM is 140 mV±10 mV.
T1, T6	(E) RF Adjustment (RX)	CH5 Talk	T1 T6	1. Connect S.S.G. to ▼4–▼2. 2. Connect the loop simulator and AF VTVM to ▼3–▼6. Connect the RF VTVM to ▼7 –▼8. 3. Apply a 60 dBμV output from S.S.G. (modulation frequency 1 kHz, dev. 3 kHz). 4. Apply a DC 48 V from loop simulator. 5. Adjust **T1** so that the reading of the RF VTVM is maximum output. 6. Apply a 40 dBμV output from S.S.G. (modulation frequency 1 kHz, dev. 3 kHz), and adjust **T6** so that reading of the AF VTVM is maximum output.

FREQUENCY TABLE (MHz)

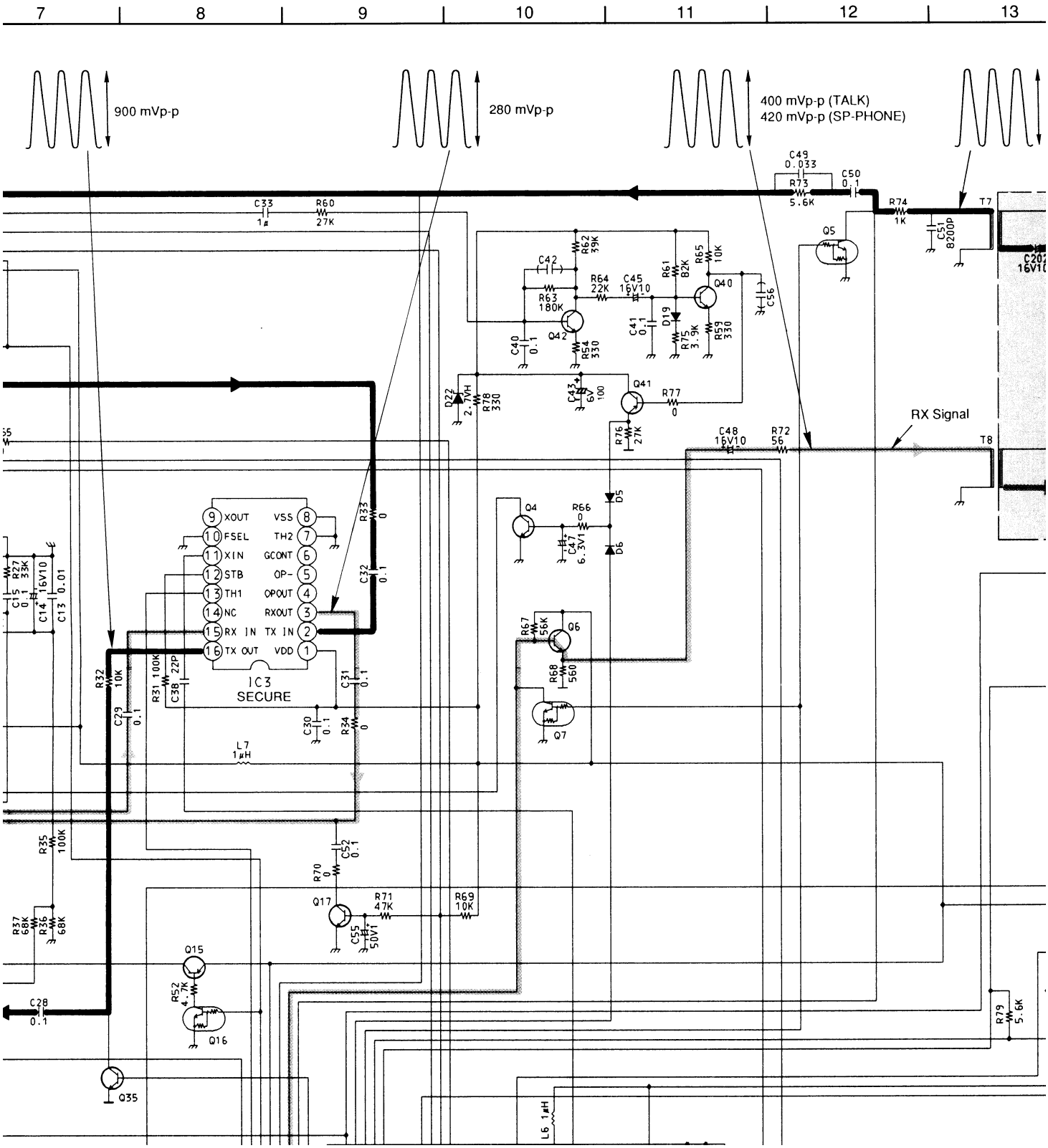
	KX-T3970H		KX-T3970R	
	Transmit Frequency	Receive Frequency	Transmit Frequency	Receive Frequency
CH1	46.611	49.669	49.669	46.611
CH2	46.631	49.844	49.844	46.631
CH3	46.671	49.859	49.859	46.671
CH4	46.711	49.769	49.769	46.711
CH5	46.731	49.874	49.874	46.731
CH6	46.771	49.829	49.829	46.771
CH7	46.831	49.889	49.889	46.831
CH8	46.871	49.929	49.929	46.871
CH9	46.931	49.989	49.989	46.931
CH10	46.971	49.969	49.969	46.971

Flow Solder Side View

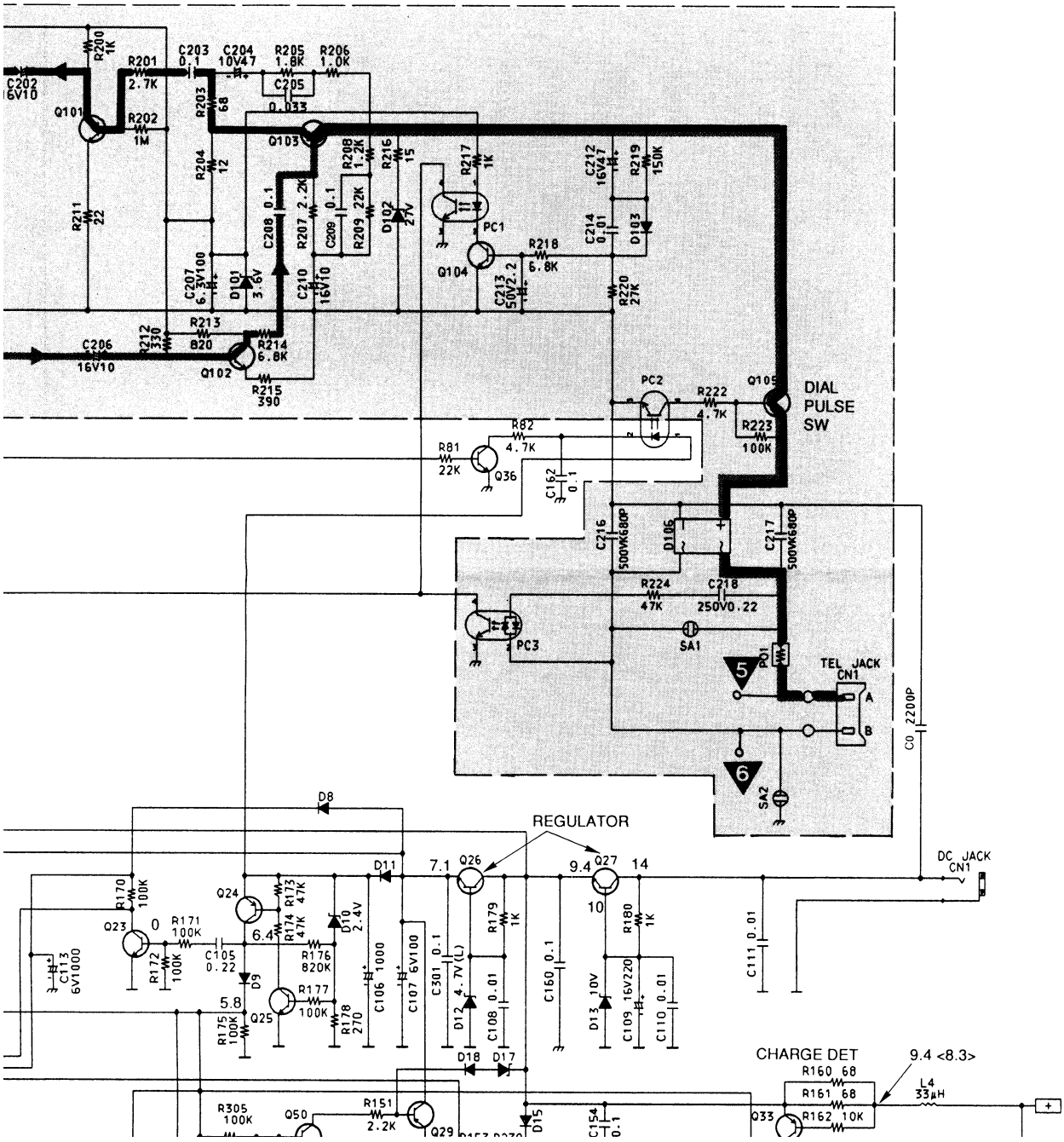


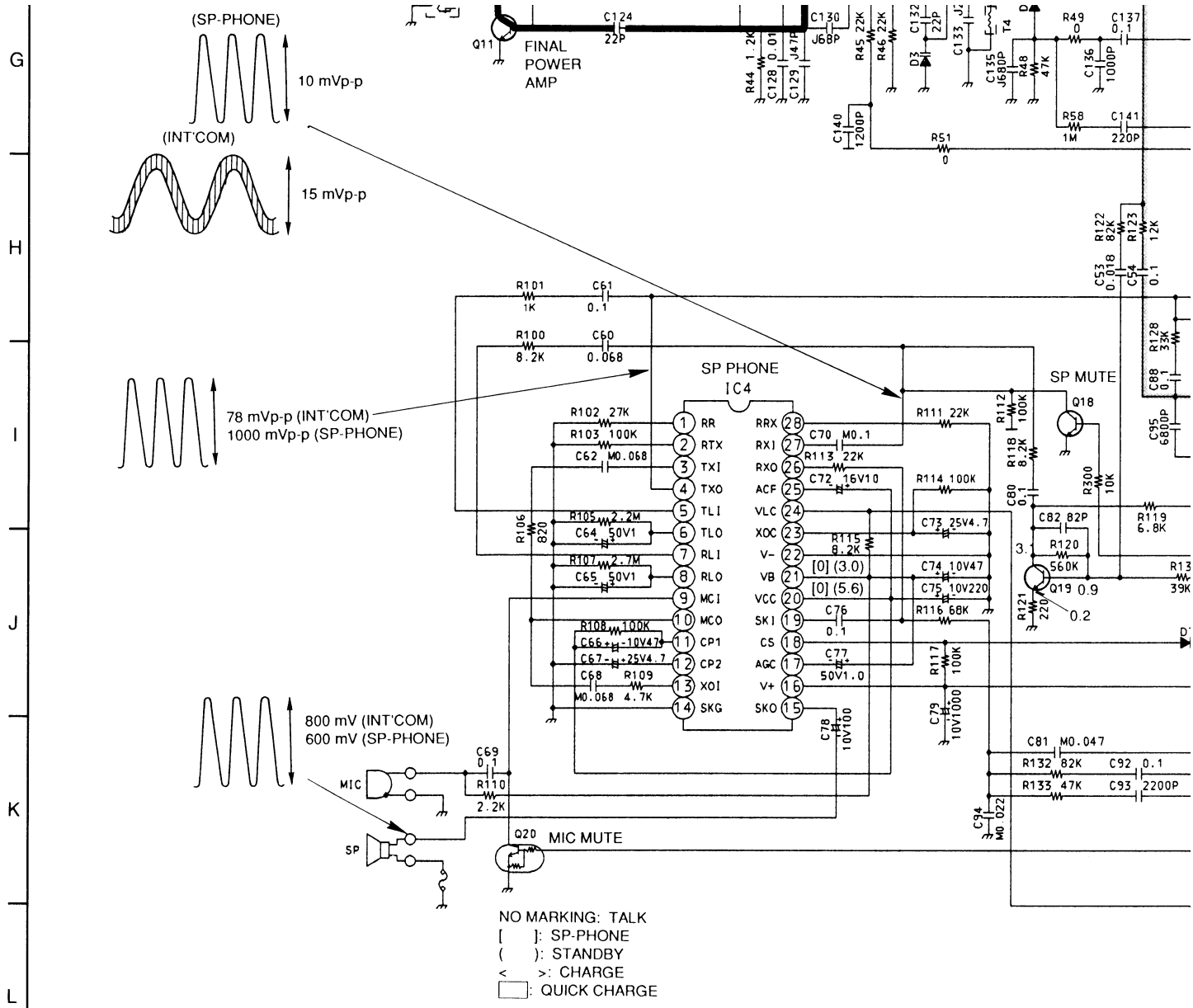

1.7 Vp-p
300 mVp-p
90 mVp-p
(SP-PHONE)
10 mVp-p
(INT'COM)
TX Signal
RF AMP
FINAL POWER AMP
TX OSC
IC1
DUP1
ANT
TX
RX
GND
ALC IN
ALCFILT
QAD
RF
LIM C2
LIM C1
LIM IN
SUB RF
MIX2 OUT
MIX2 IN
GND RF
MIX OUT
MIX INE
MIX IN
BD1
BD2
CLOCK
EN
S DATA
LOCK DET
FIN TX
SUB PLL
TXPD OUT
GND PLL
RXPD OUT
VCC PLL
LO2 OUT
LO2 IN
VCC

SCHEMATIC DIAGRAM (KX-T3970H)



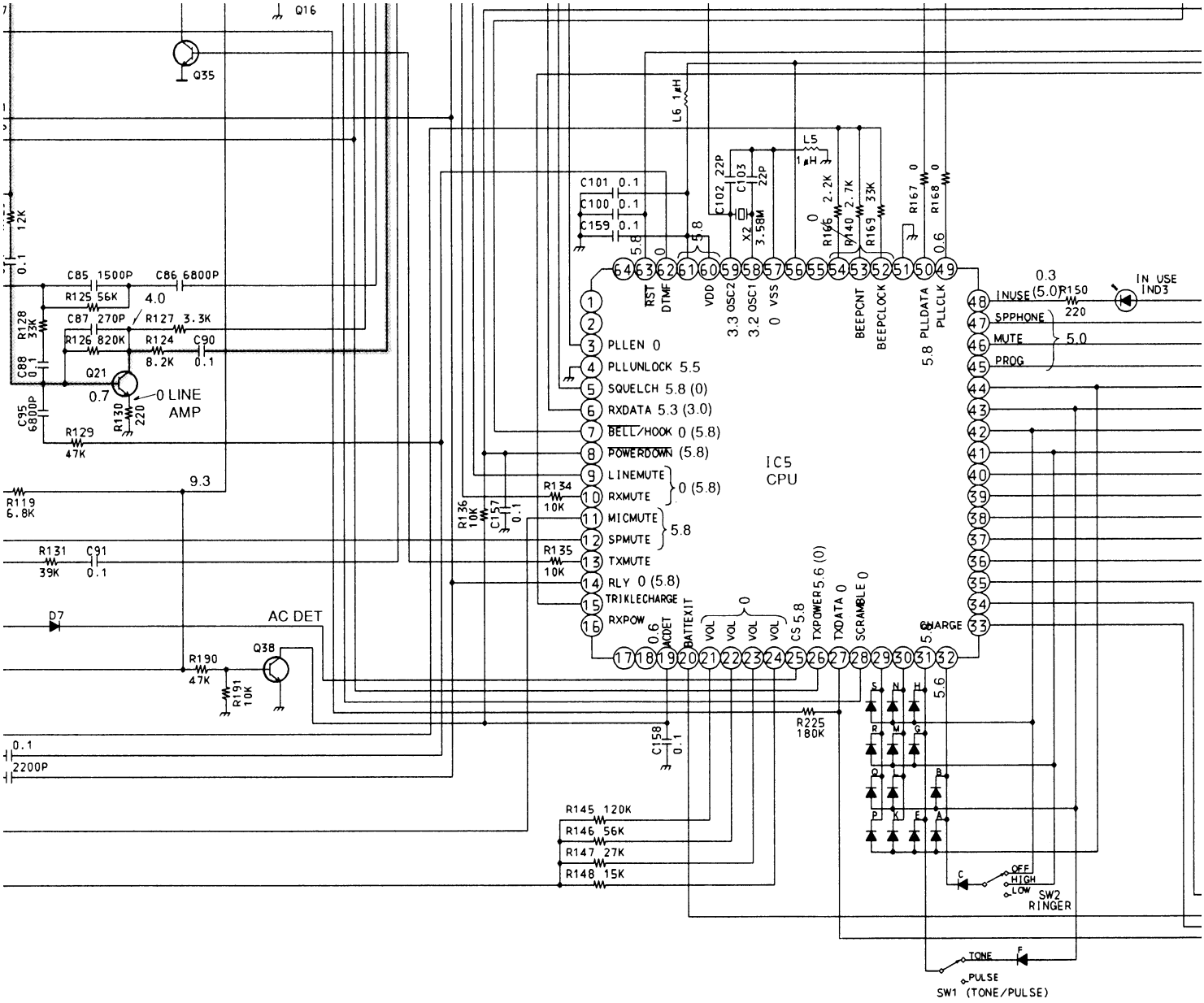
110 mVp-p


DIAL PULSE SW
REGULATOR
TEL JACK CN1
DC JACK CN1
CHARGE DET
9.4 <8.3>
Q101
Q102
Q103
Q104
Q105
Q23
Q24
Q25
Q26
Q27
Q29
Q33
Q36
Q50
PC1
PC2
PC3
D8
D9
D10
D11
D12
D13
D15
D17
D18
D101
D102
D103
D105
SA1
SA2
5
6



Notes:

1. S1~12: Dialing Switch
2. S13~20: Station Switch
3. S21: Program Switch
4. S22: Lower Switch
5. S23: Volume (Up) Switch
6. S24: Volume (Down) Switch
7. S25: Redial Switch
8. S26: Pause Switch
9. S27: SP-Phone Switch
10. S28: Hold Switch
11. S29: Mute Switch
12. S30: Flash Switch
13. SW1: Dialing Mode Selector Switch
14. SW2: Ringer Selector Switch
15. SW3: Page/Intercom Switch

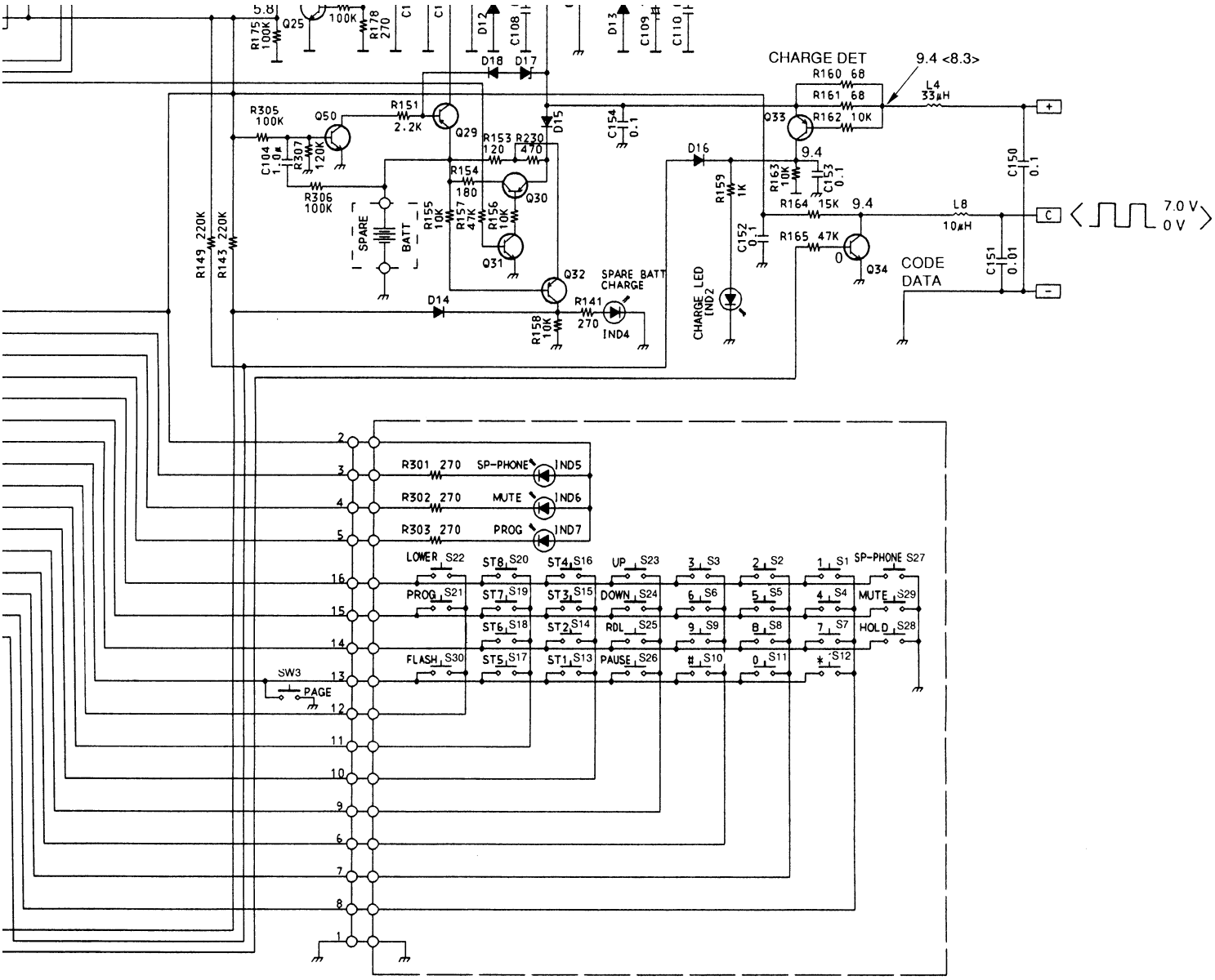


16. DC voltage measurements are taken with an electronic voltmeter from the negative voltage line.

Important Safety Notice

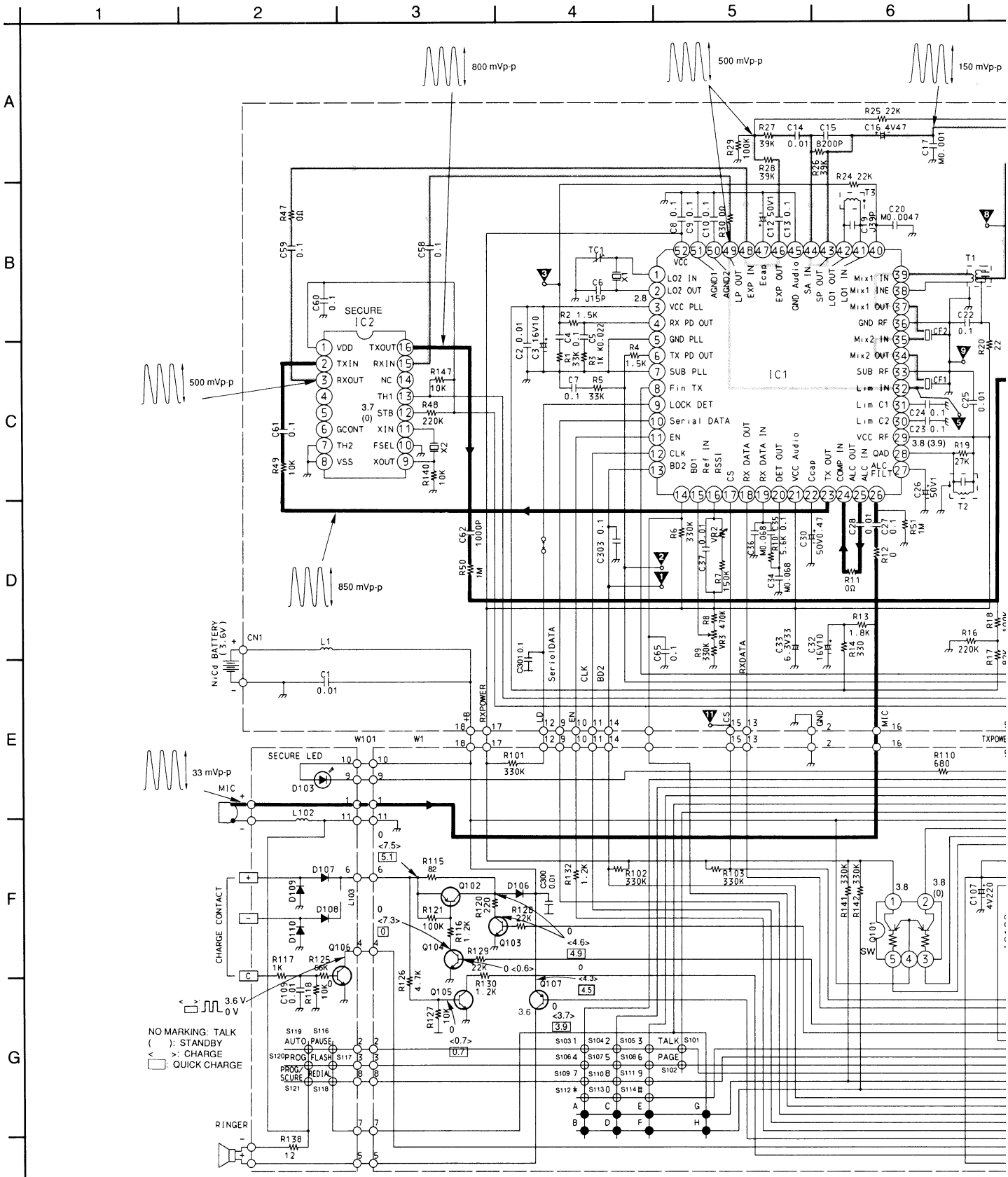
The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.
When servicing, it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

This schematic d any time with the technology.



ic diagram may be modified at
the development of new

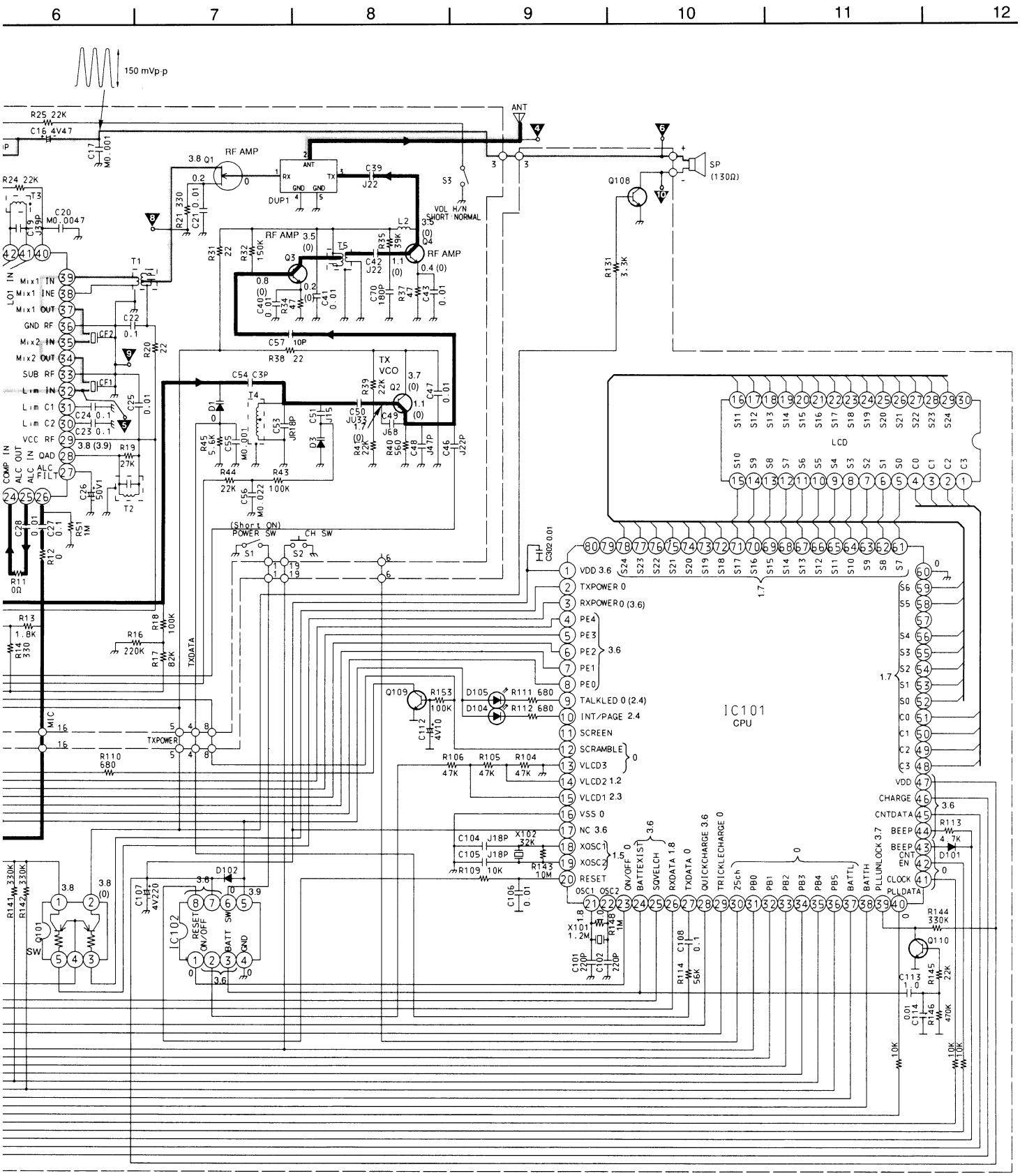
SCHEMATIC DIAGRAM



Notes:

1. S1: Power/Ringer Switch
2. S2: Channel Switch
3. S101: Talk Switch
4. S3: Volume Selector Switch
5. S102: Page/Intercom Switch
6. S103~S111, S113, S114: Dialing Switch
7. S112: Tone Switch
8. S116: Pause Switch
9. S117: Flash Switch
10. S118: Redial Switch
11. S119: Auto Switch
12. S120: Program Switch

C DIAGRAM (KX-T3970R)



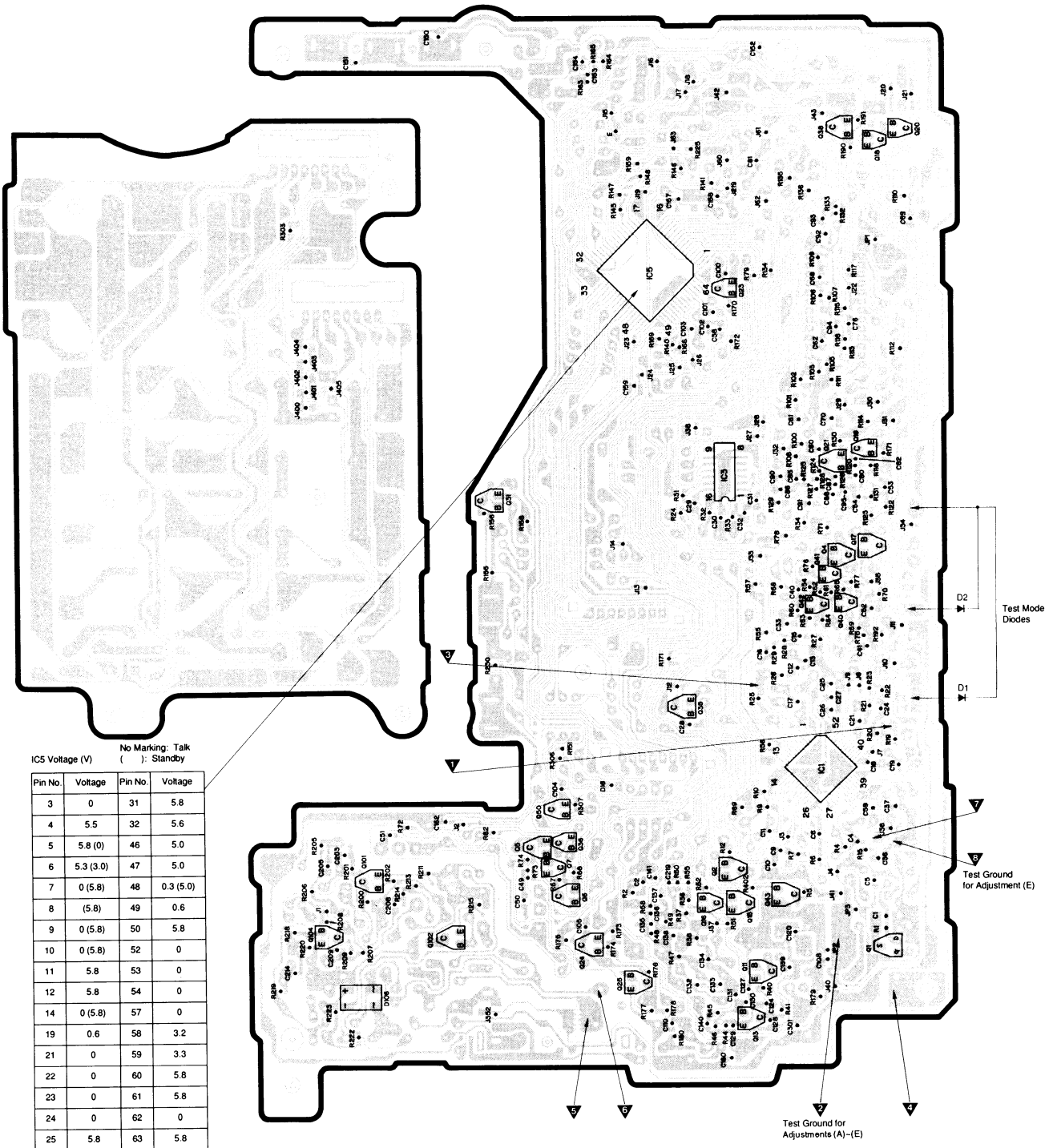
Flash Switch
Redial Switch
Auto Switch
Program Switch

13. S121: Secure Switch
14. DC voltage measurements are taken with electronic voltmeter from negative voltage line

This schematic diagram may be modified at any time with the development of new technoloty.

CIRCUIT BOARD (KX-T3970H)

(Flow Solder Side View)



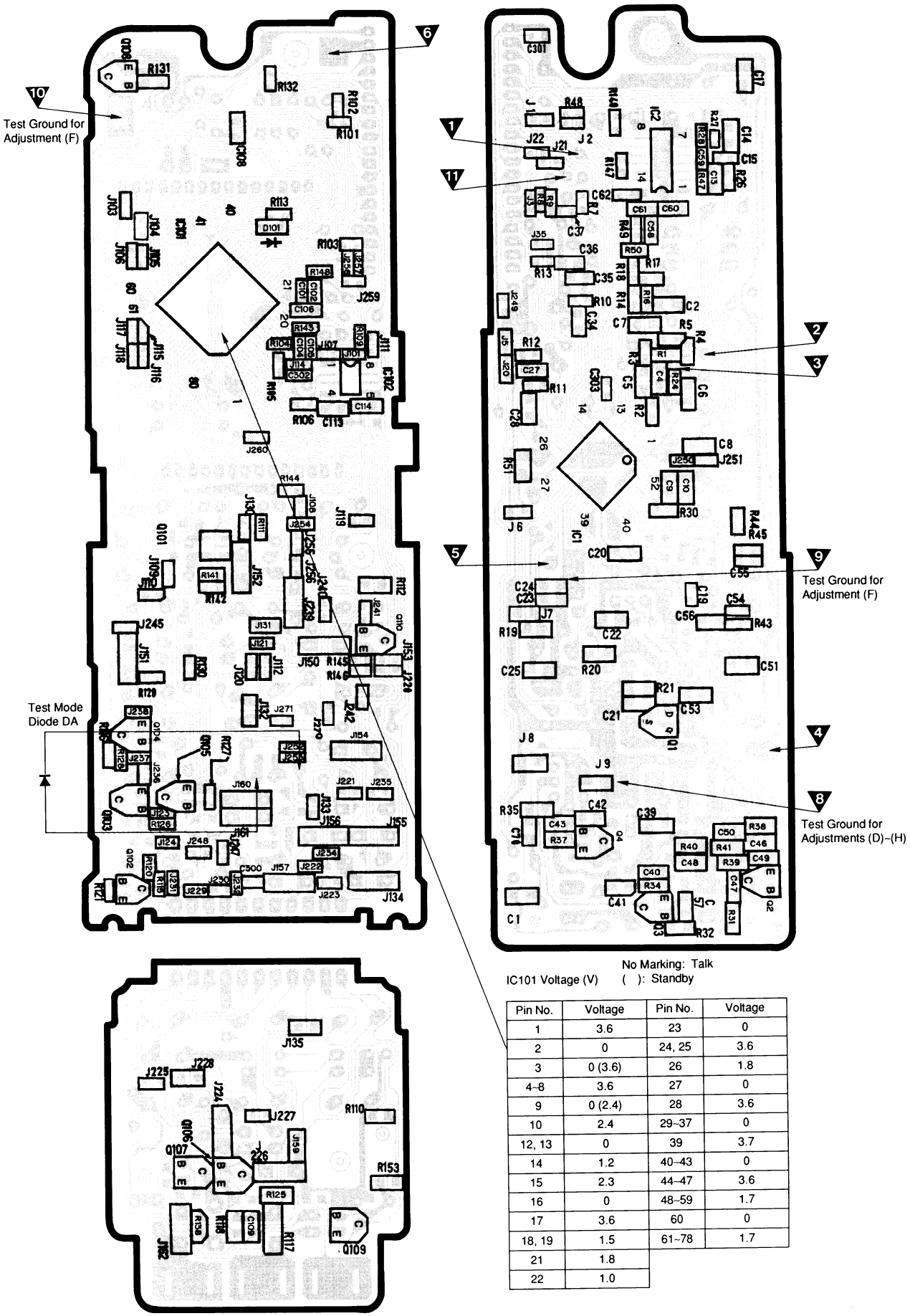
IC5 Voltage (V)

No Marking: Talk
( ): Standby

Pin No.	Voltage	Pin No.	Voltage
3	0	31	5.8
4	5.5	32	5.6
5	5.8 (0)	46	5.0
6	5.3 (3.0)	47	5.0
7	0 (5.8)	48	0.3 (5.0)
8	(5.8)	49	0.6
9	0 (5.8)	50	5.8
10	0 (5.8)	52	0
11	5.8	53	0
12	5.8	54	0
14	0 (5.8)	57	0
19	0.6	58	3.2
21	0	59	3.3
22	0	60	5.8
23	0	61	5.8
24	0	62	0
25	5.8	63	5.8
26	5.6 (0)		
27	0		
28	0		

CIRCUIT BOARD (KX-T3970R)

(Flow Solder Side View)



No Marking: Talk
IC101 Voltage (V) ( ): Standby

Pin No.	Voltage	Pin No.	Voltage
1	3.6	23	0
2	0	24, 25	3.6
3	0 (3.6)	26	1.8
4–8	3.6	27	0
9	0 (2.4)	28	3.6
10	2.4	29–37	0
12, 13	0	39	3.7
14	1.2	40–43	0
15	2.3	44–47	3.6
16	0	48–59	1.7
17	3.6	60	0
18, 19	1.5	61–78	1.7
21	1.8		
22	1.0		

ADJUSTMENTS (KX-T3970R)

If your unit have below symptom, adjust for each item following table of adjustment.

Symptom	Remedy
The movement of Battery Low Indicator is wrong.	Adjust the adjustment item (A)
The base unit does not receive a call from portable handset.	Adjust the adjustment item (B)
The base unit does not transmit, and the transmit frequency is slipped.	Adjust the adjustment item (C)
The transmit frequency is slipped.	Adjust the adjustment item (D)
The transmit output is low, and the arrival distance is shorted between base unit and portable handset.	Adjust the adjustment item (E)
The reception sensitivity of base unit is wrong, the noise is occurred.	Adjust the adjustment item (F)
Does not link between base unit and portable handset.	Adjust the adjustment items (G), (H)

Unit Condition:

1. Remove the antenna lead wire from P.C. Board of portable handset.
2. Power Supply: DC 3.9 V
3. Power/Ringer switch: ON
4. Volume Selector: HIGH
5. Speaker Loard: 130Ω

How to set the test mode.

CH10 Test Mode

1. After connecting the diode DA, and apply a power supply DC 3.9 V.
   (The unit becomes CH10 Talk)
2. Press the talk switch (CH10 Standby)
3. Press the talk switch (CH10 Talk)

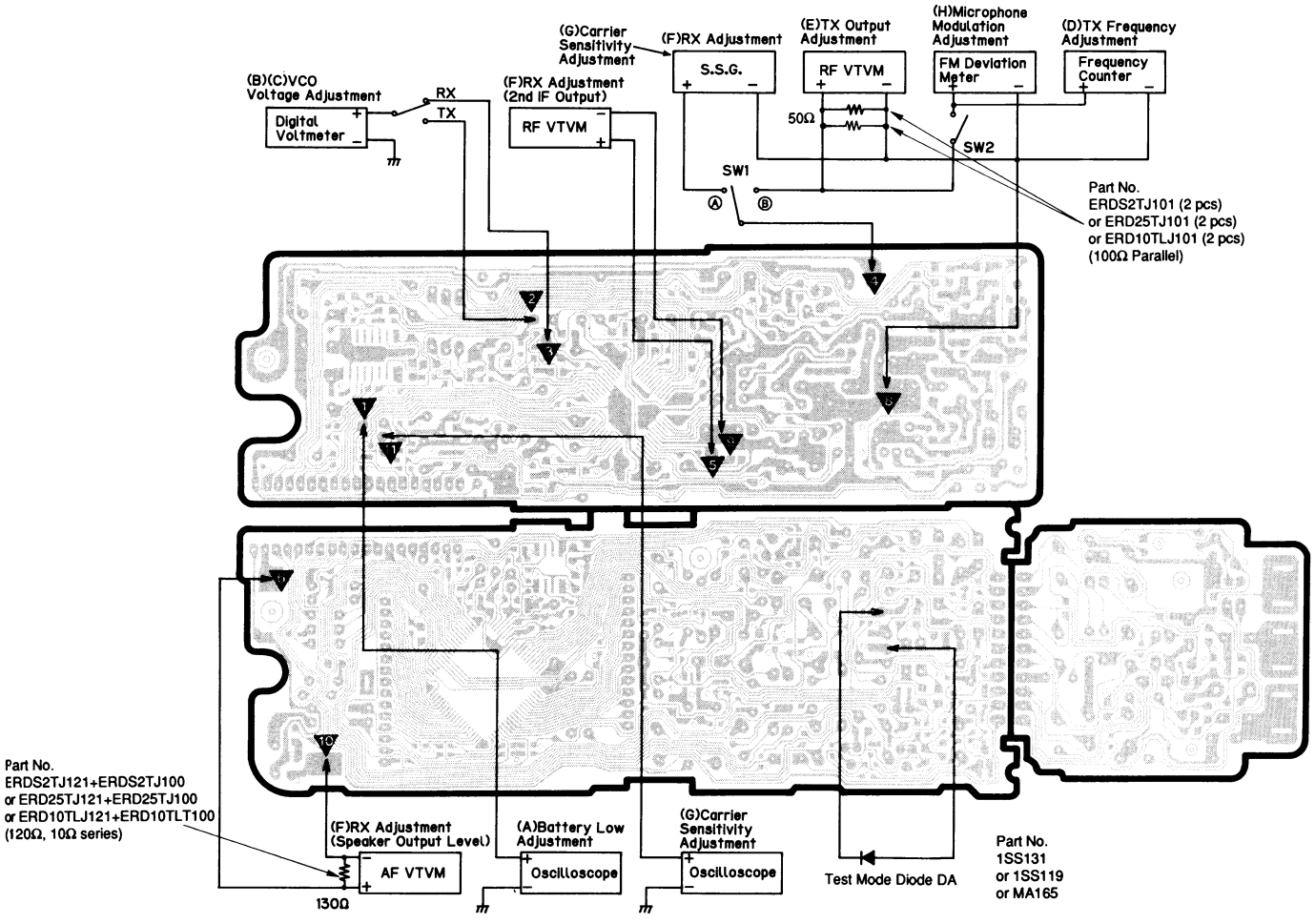
When replacing these parts, adjust as shown below table.

Replace Parts	Adjustment Items	Test Mode	Adjustment Points	Procedure
VR3	(A) Battery Low Adjustment	CH10 Talk	VR3	1. Connect the oscilloscope to ▼-Ground. 2. Set the power supply voltage to DC 3.59 V, and adjust **VR3** so that the reading of oscilloscope is 1 V±0.3 V.
IC1, TC1, X1, T4	(B) TX VCO Voltage Adjustment	CH10 Talk	T4	1. Connect the digital voltmeter to ▼-Ground. 2. Adjust **T4** so that the reading of digital voltmeter is 2.0 V±0.1 V.
IC1, TC1, X1, T3	(C) RX VCO Voltage Adjustment	CH10 Talk	T3	1. Connect the digital voltmeter to ▼-Ground. 2. Adjust **T3** so that the reading of digital voltmeter is 2.1 V±0.1 V.
TC1, X1, IC1	(D) TX Frequency Adjustment	CH10 Talk SW1: Ⓑ side SW2: ON	TC1	1. Connect the frequency counter to ▼– ▼. 2. Adjust **TC1** so that the reading of frequency counter is 49.969 MHz±200 Hz.
T5	(E) TX output Adjustment	CH10 Talk SW1: Ⓑ side SW2: OFF	T5	1. Connect the RF VTVM to ▼– ▼. 2. Adjust **T5** For 210 mV~400 mV output on RF VTVM.

When replacing these parts, adjust as shown below table.

Replace Parts	Adjustment Items	Test Mode	Adjustment Point	Procedure
T1, T2	(F) RX Adjustment	CH10 Talk SW1: Ⓐ side SW2: OFF		1. Connect the S.S.G. to ⑨ – ⑧. 2. Connect the RF VTVM to ⑤ – ⑧. Connect the AF VTVM to ⑥ – ⑩. 3. Apply a 60 dBμV output from S.S.G. (modulation frequency 1 kHz, dev. 3 kHz)
	(Speaker Output)		T2	4. Adjust **T2** so that the reading of AF VTVM is maximum output.
				5. Apply a 60 dBμV output from S.S.G. (modulation frequency 1 kHz, dev. 3 kHz)
	(2nd IF Output)		T1	6. Adjust **T1** so that the reading of RF VTVM is maximum output.
VR2	(G) Carrier Sensitivity Adjustment	CH10 Stand-By SW1: Ⓐ side SW2: OFF	VR2	1. Connect the oscilloscope to ① -Ground. 2. Connect the S.S.G. to ⑨ – ⑧. 3. Apply a 10 dBμV output from S.S.G. and adjust VR2 when oscilloscope becomes from high to low.
Refer to page 58.	(H) Data Modulation of Confirmation	CH10 Talk SW1: Ⓑ side SW2: ON	———	1. Connect the FM deviation meter ⑨ – ⑧. 2. Keep pressing the flash button. 3. Confirm for a 6.0~8.5 kHz FM Deviation Meter reading.

Flow Solder Side View



CPU DATA KX-T3970H (Base unit)

■ IC5 MN150808KJAD

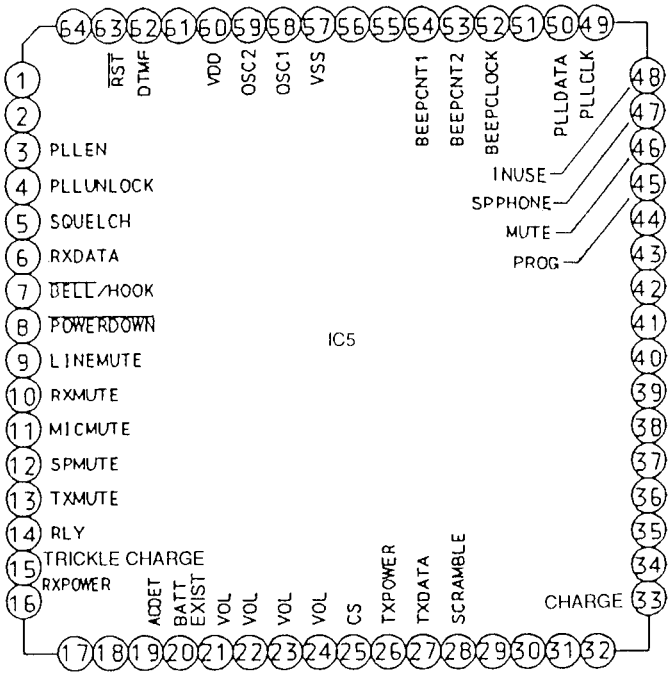


Fig. 14

Pin No.	Signal Name	I/O	High	High-Z	Low
1	25CH RF Control	O	15CH	—	Normal
2	(PULSE MUTE)	O		—	Normal
3	PLL EN	O	Active	—	Normal
4	PLL Unlock	I	Unlock	—	Lock
5	SQUELCH	I	Weak Electric Field	—	Strong Electric Field
6	RX DATA	I	1	—	0
7	Hook/Bell	I	Off Hook	—	Bell in
8	Power Down	I	Normal	—	Down
9	Line MUTE	O	Mute	—	Unmute
10	RX MUTE	O	Mute	—	Unmute
11	MIC MUTE	O	Mute	—	Unmute
12	SP MUTE	O	Mute	—	Unmute
13	TX MUTE	O	Mute	—	Unmute
14	TR-RLY	O	ON	—	OFF
15	Trickle Charge	O	Trickel	—	Normal
16	RX POWER	O	ON	—	OFF
17	Clock Control	O	—	Active	Normal
18					
19	AC	I	Negative	—	Active
20	Spare Batt. Exist	I	Active	—	Negative
21	Electronic Volume 0	O	—		
22	Electronic Volume 1	O	—		
23	Electronic Volume 2	O	—		
24	Electronic Volume 3	O	—		
25	SP-PHONE	O	OFF	—	ON
26	TX POWER	O	ON	—	OFF
27	TX DATA	O	1	—	0
28	SCRAMBLE	O	ON	—	OFF
29	Option Strobe	O	—	Normal	Active
30	Option Strobe	O	—	Normal	Active
31	Option Strobe	O	—	Normal	Active
32	Option Strobe	O	—	Normal	Active

Pin No.	Signal Name	I/O	High	High-Z	Low
33	Charge	I	Charge	—	Non
34	Key Strobe	O	—	Normal	Active
35	Key Strobe	O	—	Normal	Active
36	Key Storbe	O	—	Normal	Active
37	Key Strobe	O	—	Normal	Active
38	Key Strobe	O	—	Normal	Active
39	Key Storbe	O	—	Normal	Active
40	Key Storbe	O	—	Normal	Active
41	Key in	I	Normal	—	Key in
42	Key in	I	Normal	—	Key in
43	Key in	I	Normal	—	Key in
44	Key in	I	Normal	—	Key in
45	PROGRAM LED	O	—	OFF	ON
46	SP-PHONE LED	O	—	OFF	ON
47	MUTE LED	O	—	OFF	ON
48	IN USE LED	O	—	OFF	ON
49	Serial Clock	O	(Active)	Normal	(Active)
50	Serial Data	O	(Active)	Normal	(Active)
51	(DATA Mute)	I	—	—	—
52	Beep Clock	O	(Active)	Normal	(Active)
53	BEEP Control 0	O	—	Large	Small
54	BEEP Control 1	O	—	Large	Small
55	QUICK CHARGE LED	O	—	OFF	ON
56	External Interrupt Input	I	Normal	—	—
57	V_{SS}				GND
58	CPU Clock	I			
59	(3.581 MHz)	O			
60	Power Source				
61	External Interrupt	I	Normal		
62	DTMF	O	(Active)	Normal	(Active)
63	Reset	I	Normal	——	Reset
64	Synchronous Signal Output	O		——	

■ MN150808KJAD (IC5) TERMINALS EXPLANATION

Pin No.	Pin Name	Classification	I/O	Description
60 57	V_{DD} V_{SS}	Power supply		For connection of +2.2~5.5 V to Vdd and 0 V to Vss.
58 59	OSC1 OSC2	Clock input Clock output	I O	Oscillation terminal for connection of an oscillator. Feedback resistance is built-in.
63	RST	Reset input	I	RESET mode is on when "L" level is input for 1 machine cycle or more. The pull-up resistance and the Schmitt input circuit are built in. After the RESET mode is off, the internal RESET is released after 2^{13} count of OSC input clock.
64	SYNC	Synchronous signal output	O	Internal timing signal is output at every 1 machine cycle.
56	IRQ	External interrupt input	I	For interrupt at a negative edge. The Schmitt input circuit is built in. The pull-up resistance can be designated by software option.
61	SIRQ	External Interrupt Input	I	For unconditional interrupt at a negative edge. The Schmitt input circuit is built in. The pull-up resistance can be designated by software option.
49	SBT (PCO)	Serial interface clock I/O	I/O (I)	I/O terminal for transmission and reception of serial interface clock. This can be used as the normal input port. The Schmitt input circuit is built in. The pull-up resistance can be designated by software option.
50	SBO (PC1)	Serial interface data output	O (I)	Output terminal for transmission of the serial interface data (8-bit serial data). This can also be used as the normal input port. The pull-up resistance can be designated by software option.
51	SBI (PC2)	Serial interface data intput	I (I)	Input terminal for reception of the serial interface data (8-bit serial data). This can also be used as the normal input port. The Schmitt input circuit is built in. The pull-up resistance can be designated by software option.
52	TC20 (PC3)	8-bit Presettable counter data output	O (I)	Output terminal of overflow signal of the built-in 8-bit presettable counter. This can also be used as the normal input port. The pull-up resistance can be designated by software option.
62	DTMF	DTMF signal output	O	Output terminal of the staircase signal in which two types of frequency signals are mixed. ON/OFF of output can be controlled by program.
45~48, 53~55	PA0~ PA3, PD0~ PD2	Large current or direct driving of LED	I/O	I/O ports of 4-bit parallel data. The output structure (Nch open drain/pushable) and the pull-up resistance can be designated by software option. The LED can be driven directly.
1~40	P00~ P93	Parallel data I/O	I/O	I/O ports of 4-bit parallel data. The output structure (Nch open drain/pushable) and the pull-up resistance can be designated by software option.
41~44	PB0~ PB3	Parallel data input	I	Input port of 4-bit parallel data. The Schmitt input circuit is built in. This can also be used as the interrupt port (negative edge) by software option. The pull-up resistance can be designated by software option.

CPU DATA KX-T3970R (Portable Handset)

■ IC101 PQVI402945FU

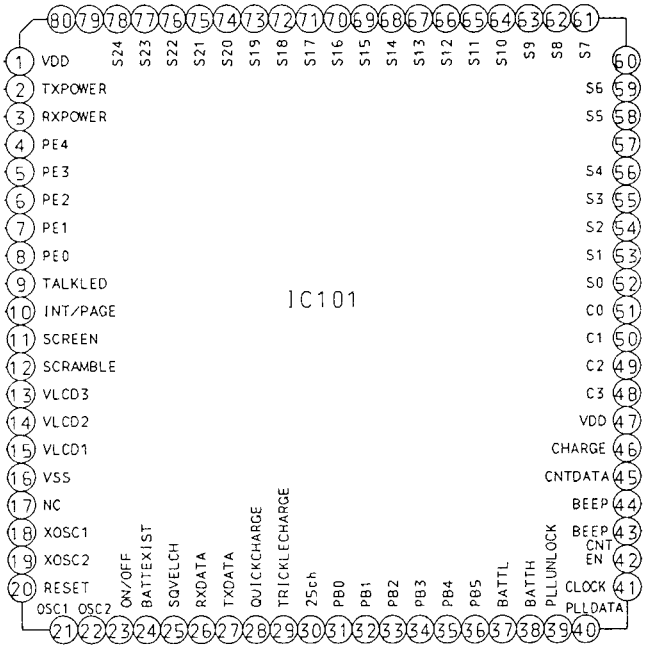


Fig. 15

Pin No.	Signal Name	I/O	High	High-Z	Low
1	Power supply				
2	$\overline{\text{TX POWER}}$	O	—	OFF	ON
3	$\overline{\text{RX POWER}}$	O	—	OFF	ON
4	Key Strobe	O	—	Inactive	Active
5	Key Strobe	O	—	Inactive	Active
6	Key Strobe	O	—	Inactive	Active
7	Key Strobe	O	—	Inactive	Active
8	Key Strobe	O	—	Inactive	Active
9	LED TALK	O	—	OFF	ON
10	LED INT'COM	O	—	OFF	ON
11	LED (SCREEN)	O	—	OFF	ON
12	Scramble	O	—	ON	OFF
13	LCD bias voltage input				
14	LCD bias voltage input				
15	LCD bias voltage input				
16	GND				
17	Power supply for one-time micro computer				
18	Sub Clock	I			
19	(32.768 kHz)	O			
20	$\overline{\text{RESET}}$	I	Normal	—	RESET
21	Main Clock	I			
22	(1.2 MHz)	O			
23	$\overline{\text{ON/OFF}}$ SW	I	OFF	—	ON
24	$\overline{\text{Batt Exist}}$	I	Yes	—	No
25	SQUELCH	I	Weak	—	Strong
26	RX DATA	I		—	
27	TX DATA	O	Active	—	Normal
28	Quick Charge	O	0.3C	—	Normal
29	Trickle Charge	O	0.03C	—	Normal
30	25CH RF Select	O	15 ch	—	10 ch

Pin No.	Signal Name	I/O	High	High-Z	Low
31	Key In 0	I	Without key	—	With key
32	Key In 1	I	Without key	—	With key
33	Key In 2	I	Without key	—	With key
34	Key In 3	I	Without key	—	With key
35	Option 1	I	No	—	Yes
36	Option 2	I	No	—	Yes
37	Batt Low L	I	Low	—	High
38	Batt Low H	I	Low	—	High
39	Replacement of battery	I	Normal	—	Replace-ment
40	PLL_Data	O	Active	—	Normal
41	PLL_Clock	O	Active	—	Normal
42	PLL_EN	O	Active	—	Normal
43	BEEP CONTROL	O	Low volume	—	High volume
44	BEEP CLOCK	O	Normal	—	Active
45	CONTROL (DATA)	I	Normal	—	Active
46	CHARGE	I	Normal	—	CHARGE
47	Power supply				
48	LCD COMMON 0	O			
49	LCD COMMON 1	O			
50	LCD COMMON 2	O			
51	LCD COMMON 3	O			
52~59	LCD SEGMENT	O			
60					
61~79	LCD SEGMENT	O			
80	Lighted Dial	O	—	ON	OFF

■ PQVI402945FU (IC101) TERMINALS EXPLANATION

Pin No.	Pin Name	Classification	Description	
1 16	V_{DD} V_{SS}	Power supply input	For connection of the positive power supply to V_{DD} and 0 V to V_{SS}.	
13 ~ 15	VLCD1 VLCD2 VLCD3	LCD driver bias voltage input	Input terminals of the bias voltage for driving the LCD. VLCD1=V_{DD}-1/3 VLCD **VLCD2=V_{DD}-2/3 VLCD** **VLCD3=V_{DD}-3/3 VLCD** On condition that V_{DD}-0.3 V </= VLCD </= V_{DD}+0.3 V.	
21 22	OSC1 OSC2	Connection of the main clock oscillator	Control input terminals for the main clock oscillation circuit. The crystal resonator or ceramic resonator is connected between these terminals. When an external clock is used, connect it to the OSC1 and open the OCS2. The feedback resistance can be set between the OSC1 and the OSC2 as the mask option.	
18 19	XOSC1 XOSC2	Connection of the subsidiary clock oscillator	Control input terminals for the subsidiary clock oscillation circuit. The crystal **oscillator** of 32.768 kHz is connected between these terminals. When an external clock is used, connect it to the XOSC1 and open the XOSC2. The feedback resistance and damping resistance can be set between the XOSC1 and XOSC2 as the mask option.	
20	$\overline{\text{RESET}}$	Reset input	When the L level signal is input, the MCU is reset. The pull-up resistance can be connected as the mask option.	
23 ~ 30	PA0~PA7	I/O of port A bit 0–bit 7	I/O ports of 8 bits. The data direction can be set in bits with the data direction register A (DDRA). The input mode is selected after reset. The pull-up resistance and the open drain output option can be set in nibbles.	
31 ~ 38	PB0/$\overline{\text{KWI0}}$ ~ PB7/$\overline{\text{KWI7}}$	Input of ports B bit 0–bit 7, Key wake-up input 0–7	8-bit input dedicated ports. The pull-up resistance option can be set in nibbles.	Input ports of key wake-up which interrupts at the fall edge. The terminal used for interrupt can be set in bits.
39	PC0/SD1	I/O of port C bit 0, Input of the serial data	Port C consists of the 6-bit I/O ports and the 2-bit input dedicated port. The 6-bit I/O port can set the data direction in bits with the data direction register C (DDRC). The input mode is selected after reset. The pull-up resistance option and the open drain output option can be set in bits.	Serial data input terminal of the SP1.
40	PC1/SD0	I/O of port C bit 1, Output of the serial data		Serial data output terminal of the SP1.
41	PC2/SCK	I/O of port C bit 2, I/O of the serial clock		Serial clock terminal of the SP1. Outputs the signal in the master mode and inputs in the slave mode.
42	PC3/TCAP	I/O of port C bit 3, Input of the timer 1 input capture		Control input terminal of the timer 1 input capture function.
43	PC4/EV1	I/O of port C bit 4, Input of the timer 2 event		Input terminal of the timer 2 event counter. This also functions as the gate input in the integration mode.
44	PC5/EV0	I/O of port C bit 5, Output of the timer 2 event		Output terminal of the timer 2.

(See Next Page.)

Pin No.	Pin Name	Classification	Description	
45	PC6/$\overline{IRQ2}$	Input of port C bit 6, Input of $\overline{IRQ2}$	Port **consists of the 6-bit I/O ports** and the 2-bit input dedicated port. The 6-bit I/O port can se the data direction in bits with the data direction register C (DDRC). The input mode is selected after reset. The pull-up resistance option and the open drain output option can be set in bits.	Input terminal of the external interrupt 2. This is triggered at the fall edge.
46	PC7/$\overline{IRQ1}$	Input of port C bit 7, Input of $\overline{IRQ1}$		Input terminal of the external interrupt 1. This is triggered at the fall edge.
51	BP0	BP output 0	BP (back plane) output of the LCD driver.	
50	BP1/PD1	BP output 1, Output of port D bit 1	7-bit output dedicated port. This is also used as the LCD driver output. The open drain output option can be set in nibbles. All terminals of the port D output H level after reset.	While the LCD driver is used, only required BP terminal is used by the LCD driver according to the drive duty ratio and the other terminals is automatically set to the port output mode.
49	BP2/PD2	BP output 2, Output of port D bit 2		
48	BP3/PD3	BP output 3, Output of port D bit 3		
12 ~ 9	FP38/PD4 ~ **FP35/PD7**	FP outputs 38–35, Output of port D bit 4–bit 7		FP (front plane) output of the LCD driver. The FP output or port output function can be changed by setting in nibbles.
8 ~ 2, 80	FP34/PE0 ~ FP27/PE7	FP outputs 34–27, Output of port E bit 0–bit 7	8-bit output dedicated port. Also used as the LCD driver output. The terminal function is changed in nibbles. The open drain output option can be set in nibbles. All terminals of the port E output H level after reset.	FP (front plane) output of the LCD driver.
52 ~ 79	FP0 ~ FP26	LCD driver, FP output 0–26	FP (front plane) output terminal of the LCD driver. VLCD1 voltage level is output after reset.	

EXPLANATION OF IC TERMINALS (SECURE IC)

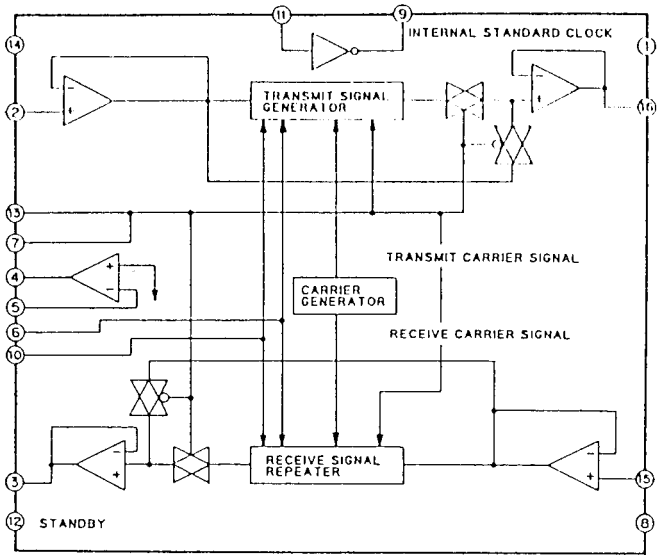


Fig. 24

Base Unit IC3 PQVIM64026FP

Portable Handset IC2 PQVIM64021FP

Pin name	Function	Pin No.	I/O	Description
Vdd	Power source	1		+Power source
Vss	GND	8		For ground connection
NC	Not connected	14		
Xin	Input of oscillation circuit	11	Input	Oscillator connection terminal (External clock supply/cystal oscillation is enabled.)
Xout	Output of oscillation circuit	9	Output	
Txin	Input of transmitted audio	2	Input	Input of transmitted audio signal (bias in the internal Vref)
Txout	Output of transmitted audio	16	Output	Output of transmitted audio signal
Rxin	Input of received audio	15	Input	Input of received audio signal (bias in the internal Vref)
Rxout	Output of received audio	3	Output	Output of received audio signal
OPout	Output of OP Amp.	4	Output	Output of optional OP Amp.
OP	Input of OP Amp.	5	Input	Input of optional OP Amp.
GCON	Gain control	6	Input	Control of transmitted/received signal level GCON=L: Tx=0 dB Rx=0 dB CGON=H: Tx=-6 dB Rx=+6 dB
THRU1	Pass mode selection	13	Input	THRU1 THRU2 Pass mode L L Transparent through pass L H Filter through pass H L Confidential talk pass H H Confidential talk pass (Same mode as above)
THRU2	Pass mode selection	7	Input	
STB	Standby selection	12	Input	Standby mode selection (Standby mode when STB is L)
FSEL	Selection of dividing ratio of internal clock	10	Input	When 3.58/3.69 MHz is used, FSEL is L. When 4.00/4.19 MHz is used, FSEL is H.

EXPLANATION OF IC TERMINALS (SPEAKERPHONE IC)

Base Unit IC4 PQVISC77655S

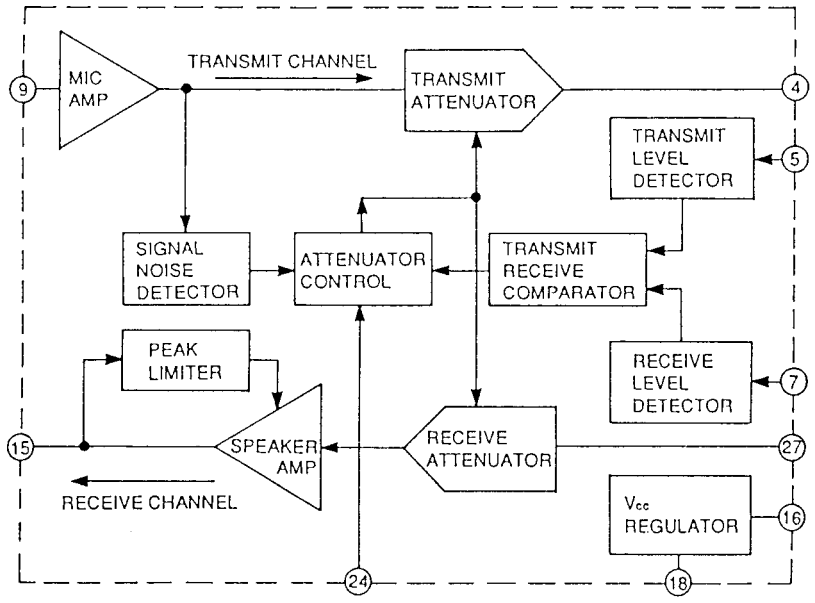


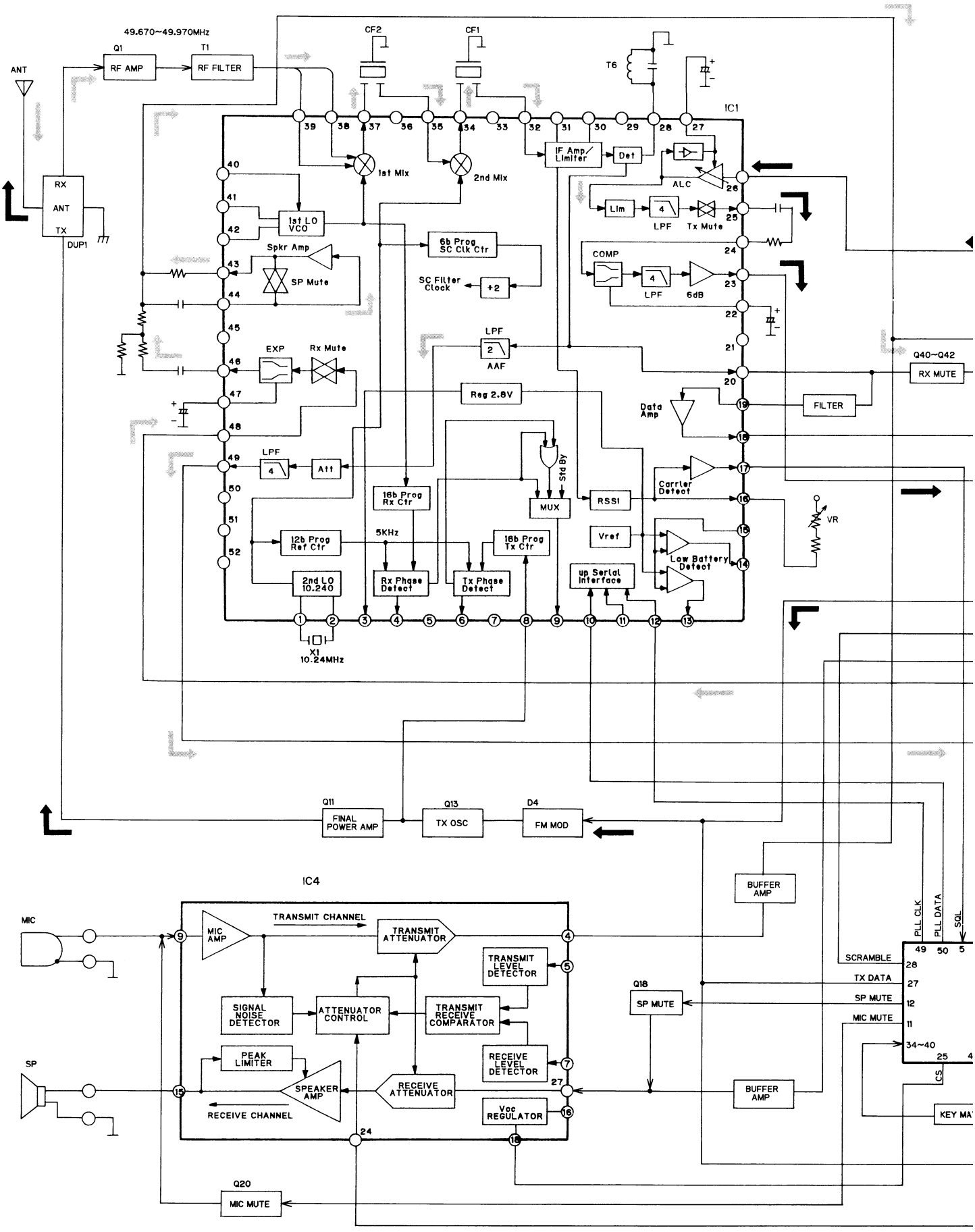
Fig. 25

• Pin Description

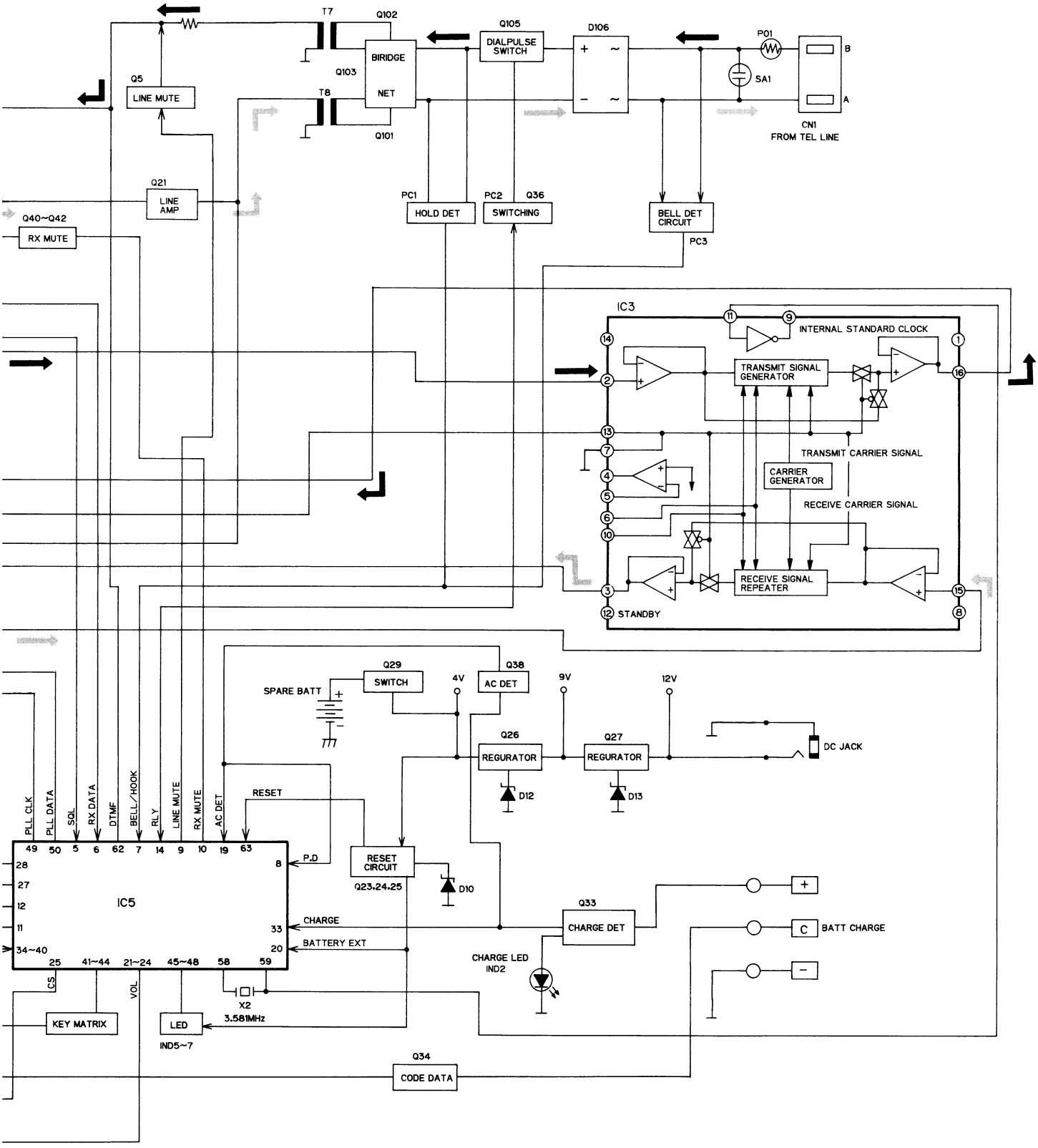
Pin No.	Name	Description
1	RR	A resistor to ground provides a reference current for the transmit and receive attenuators.
2	RTX	A resistor to ground determines the nominal gain of the transmit attenuator. The transmit channel gain is inversely proportional to the RTX resistance.
3	TXI	Input to the transmit attenuator. Input resistance is nominally 5.0 kohms.
4	TXO	Output of the transmit attenuator. The TXO output signal drives the input of the transmit level detector, as well as the external circuit which drives the telephone line.
5	TLI	Input of the transmit level detector. An external resistor ac coupled to the TLI pin sets the detection level. Decreasing this resistor increases the sensitivity to transmit channel signals.
6	TLO	Output of the transmit level detector. The external resistor and capacitor set the time the comparator will hold the system in the transmit mode after speech ceases.
7	RLI	Input of the receive level detector. An external resistor ac coupled to the RLI pin sets the detection level. Decreasing this resistor increases the sensitivity to receive channel signals.
8	RLO	Output of the receive level detector. The external resistor and capacitor set the time the comparator will hold the system in the receive mode after the receive signal ceases.
9	MCI	Microphone amplifier input. Input impedance is nominally 10 kohms and the dc bias voltage is approximately equal to VB.
10	MCO	Microphone amplifier output. The mic amp gain is internally set at 34 dB (50 V/V).
11	CP1	A parallel resistor and capacitor connected between this pin and V_{cc} holds a voltage corresponding to the background noise level. The transmit detector compares the CP1 voltage with the speech signal from CP2.
12	CP2	A capacitor at this pin peak detects the speech signals for comparison with the background noise level held at CP1.

Pin No.	Name	Description
13	XDI	Input to the transmit detector system. The microphone amplifier output is ac coupled to the XDI pin through an external resistor.
14	SKG	High current ground pin for the speaker amp output stage. The SKG voltage should be within 10 mV of the ground voltage at Pin 22.
15	SKO	Speaker amplifier output. The SKO pin will source and sink up to 100 mA when ac coupled to the speaker. The speaker amp gain is internally set at 34 dB (50 V/V).
16	V+	Input dc supply voltage. V+ can be powered from Tip and Ring if an ac decoupling inductor is used to prevent loading ac line signals. The required V+ voltage is 6.0 to 11 V (7.5 V nominal) at 7.0 mA.
17	AGC	A capacitor from this pin to VB stabilizes the speaker amp gain control loop, and additionally controls the attack and decay time of this circuit. The gain control loop limits the speaker amp input to prevent clipping at SKO. The internal resistance at the AGC pin is nominally 110 kohms.
18	$\overline{CS}$	Digital chip select input. When at a Logic "0" (<0.7 V) the V_{cc} regulator is enabled. When at a Logic "1" (>1.6 V), the chip is in the standby mode drawing 0.5 mA. An open $\overline{CS}$ pin is a Logic "0". Input impedance is nominally 140 kohms. The input voltage should not exceed 11 V.
19	SKI	Input to the speaker amplifier. Input impedance is nominally 20 kohms.
20	V_{cc}	A 5.4 V regulated output which powers all circuits except the speaker amplifier output stage. V_{cc} can be used to power external circuitry such as a microprocessor (3.0 mA max). A filter capacitor is required. The MC34018 can be powered by a separate regulated supply by connecting V+ and V_{cc} to a voltage between 4.5 V and 6.5 V while maintaining $\overline{CS}$ at a Logic "1".
21	VB	An output voltage equal to approximately $V_{cc}/2$ which serves as an analog ground for the speakerphone system. Up to 1.5 mA of external load current may be sourced from VB. Output impedance is 250 ohms. A filter capacitor is required.
22	Gnd	Ground pin for the IC (except the speaker amplifier).
23	XDC	Transmit detector output. A resistor and capacitor at this pin hold the system in the transmit mode during pauses between words or phrases. When the XDC pin voltage decays to ground, the attenuators switch from the transmit mode to the idle mode. The internal resistor at XDC is nominally 2.6 kohms.
24	VLC	Volume control input. Connecting this pin to the slider of a variable resistor provides receive mode volume control. The VLC pin voltage should be less than or equal to VB.
25	ACF	Attenuator control filter. A capacitor connected to this pin reduces noise transients as the attenuator control switches levels of attenuation.
26	RXO	Output of the receive attenuator. Normally this pin is ac coupled to the input of the speaker amplifier.
27	RXI	Input of the receive attenuator. Input resistance is nominally 5.0 kohms.
28	RRX	A resistor to ground determines the nominal gain of the receive attenuator. The receive channel gain is directly proportional to the RRX resistance.

BLOCK DIAGR


49.670~49.970MHz
Q1
RF AMP
T1
RF FILTER
ANT
CF2
CF1
T6
IC1
1st Mix
2nd Mix
IF Amp/ Limiter
Det
ALC
RX
ANT
TX
DUP1
1st LO VCO
Spkr Amp
SP Mute
6b Prog SC Clk Ctr
SC Filter Clock
÷2
Lim
LPF
Tx Mute
COMP
6dB
EXP
Rx Mute
LPF
AAF
Reg 2.8V
Data Amp
FILTER
Q40~Q42
RX MUTE
Att
Std By
MUX
RSSI
Carrier Detect
16b Prog Rx Ctr
12b Prog Ref Ctr
5KHz
16b Prog Tx Ctr
Vref
VR
Low Battery Detect
2nd LO 10.240
Rx Phase Detect
Tx Phase Detect
up Serial Interface
X1
10.24MHz
Q11
FINAL POWER AMP
Q13
TX OSC
D4
FM MOD
IC4
MIC
SP
MIC AMP
TRANSMIT CHANNEL
TRANSMIT ATTENUATOR
TRANSMIT LEVEL DETECTOR
SIGNAL NOISE DETECTOR
ATTENUATOR CONTROL
TRANSMIT RECEIVE COMPARATOR
PEAK LIMITER
SPEAKER AMP
RECEIVE ATTENUATOR
RECEIVE LEVEL DETECTOR
Vcc REGULATOR
RECEIVE CHANNEL
BUFFER AMP
Q18
SP MUTE
BUFFER AMP
Q20
MIC MUTE
PLL CLK
PLL DATA
SQL
SCRAMBLE
TX DATA
SP MUTE
MIC MUTE
34~40
CS
KEY MA

IAGRAM (KX-T3970H)



TX Signal
RX Signal

BLOCK DIAGRAM

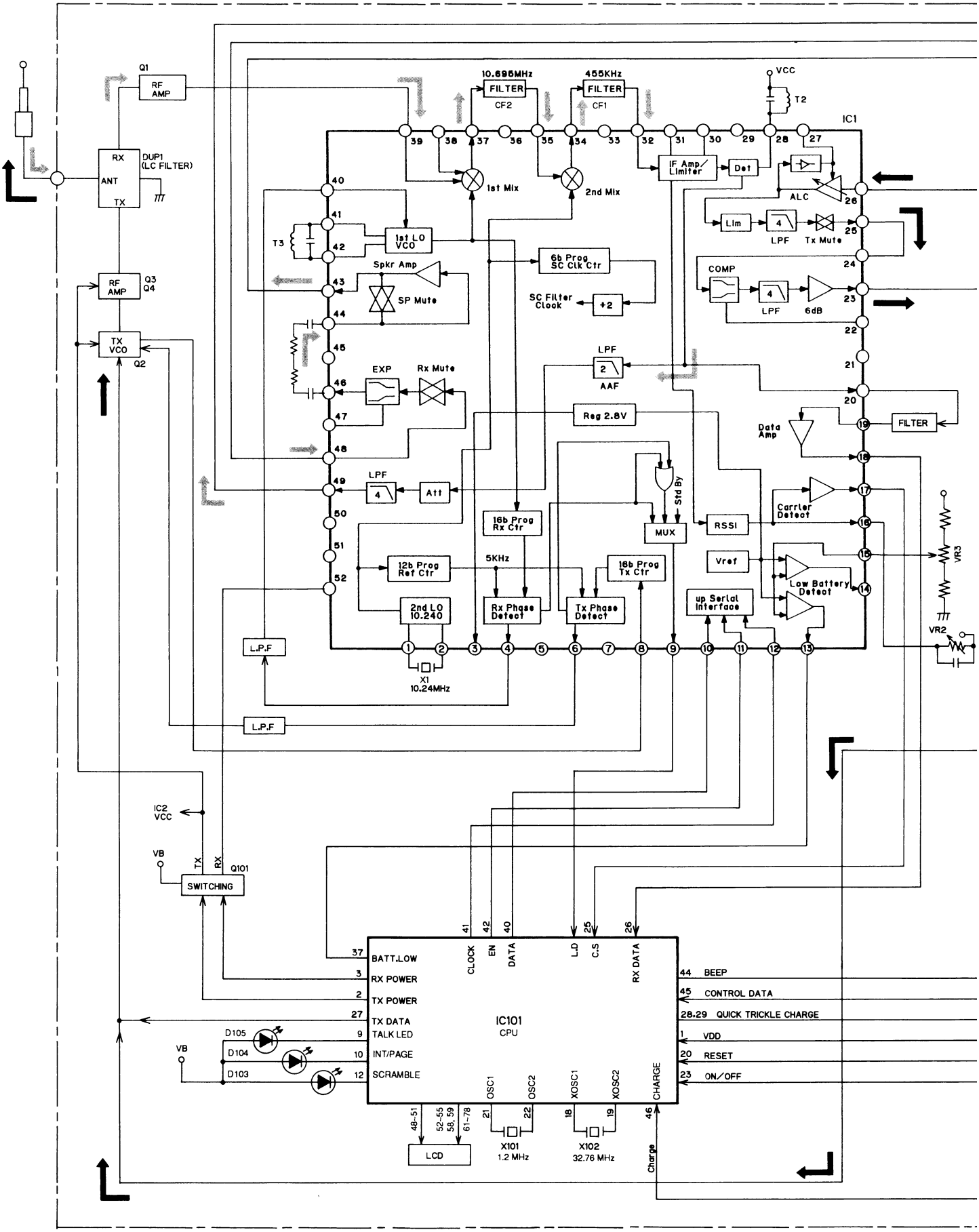
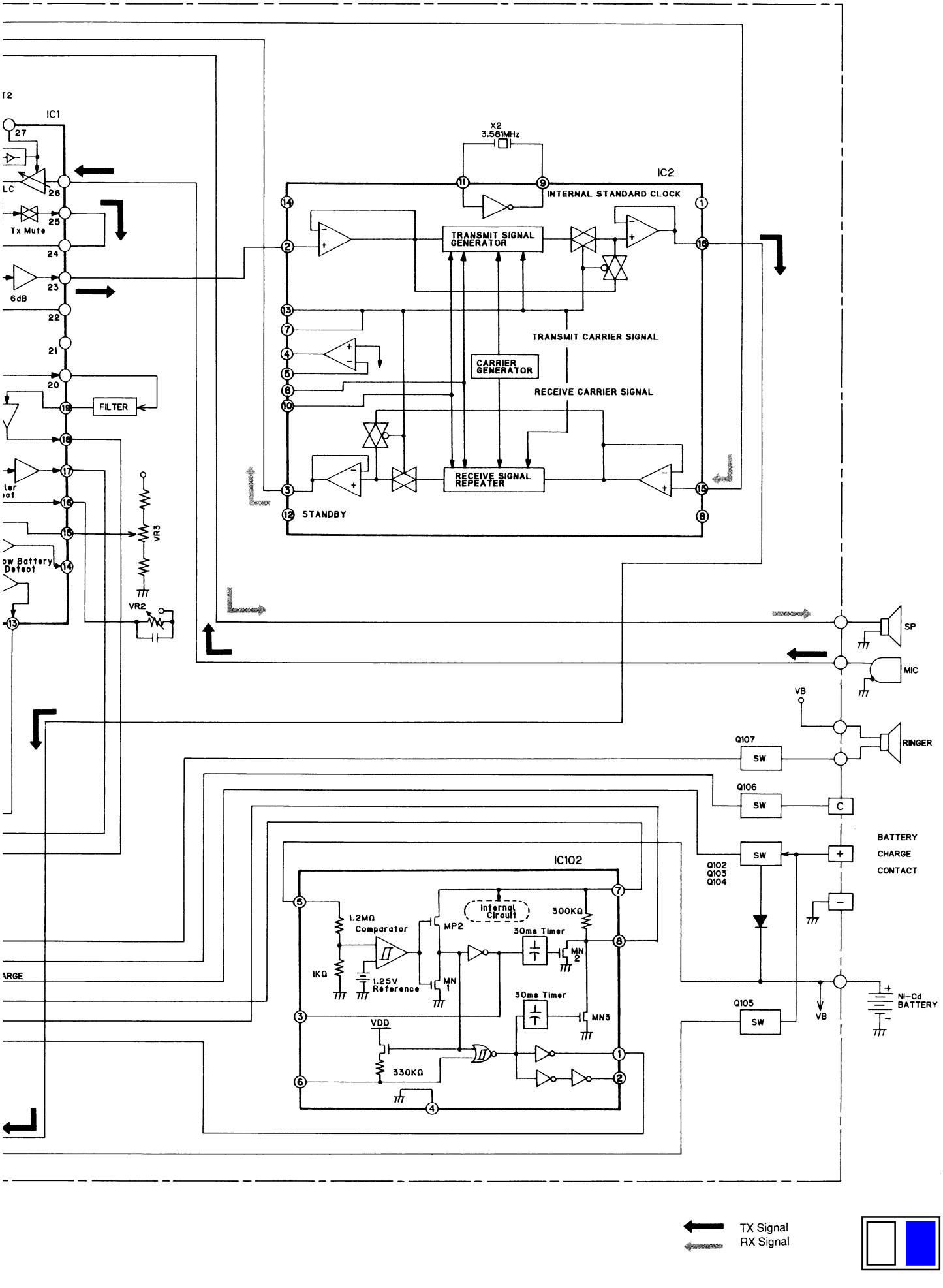


DIAGRAM (KX-T3970R)



■ CPU OPERATION

CPU Terminals / Operation Mode	27 TX DATA	3 RX POW	2 TX POW	44 BEEP OUT	43 BEEP	10 INT'COM LED	9 TALK LED
STANDBY	L	L	H	H	H	H	H
TALK	L	L	L	H	H	H	L
INTERCOM	L	L	L	H	H	L	H
KX-T3970R→KX-T3970H Paging	DATA	L	L	⎍⎍	H	FLASHING	H
KX-T3970H→KX-T3970R Ring	—	L	L	⎍⎍	L	H	FLASHING
KX-T3970H→KX-T3970R Paging	—	L	L	⎍⎍	L	FLASHING	H
CHARGE	L	L	H	H	H	H	H
During (INTCOM)	—	L	L	H	H	L	H
During (TALK)	—	L	L	H	H	H	L
KX-T3970R PULSE DIAL	DATA	L	L	—	H	H	FLASHING
KX-T3970R TONE DIAL	DATA	L	L	—	H	H	L
KX-T3970R OFF MODE	L	H	—	H	L	H	H

RF SPECIFICATION

BASE UNIT (KX-T3970H)

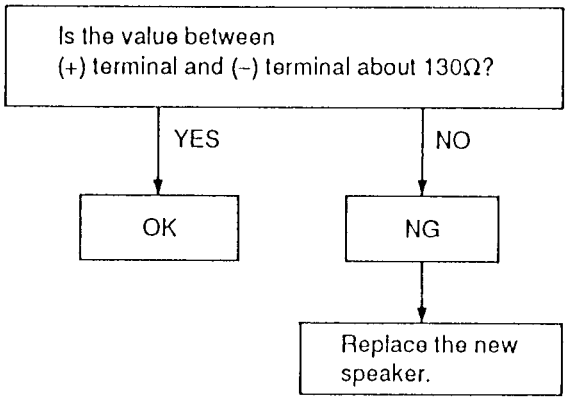
Item	Value	Refer to —.	Remarks
TX Frequency	46.971 MHz±200 Hz	Page 12 (C)	at CH10
TX Power	140 mV±10 mV	Page 12 (D)	
TX Modulation factor	2.5 kHz~4.3 kHz	———	
TX Modulation Distortion	Less than 8%	———	
Data Modulation factor	4.2 kHz~8.3 kHz	———	

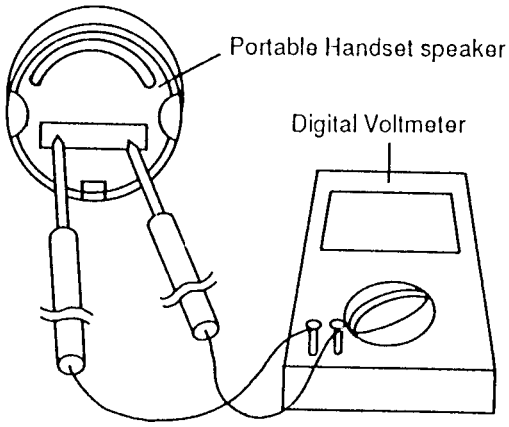
Portable Handset (KX-T3970R)

Item	Value	Refer to —.	Remarks
Practical Sensitivity	Less than 9 dBμV	———	at CH5
Carrier Sensitivity	Less than 14 dBμV	Page 21 (G)	Test Mode Standby H→L at CH5
TX Frequency	49.969 MHz±200 Hz	Page 20 (D)	at CH10
TX Output	210 mV~400 mV	Page 20 (E)	at CH10 (Antenna soldering point 50Ω Load)
Data Modulation factor	6.0 kHz/dev~8.5 kHz/dev	Page 21 (H)	at CH10
MIC Modulation factor	1.9 kHz/dev~3.6 kHz/dev	———	at CH10 (Set –40 dB at 600Ω termination. When it is inputted to MIC, remove the 600Ω.)

HOW TO CHECK THE PORTABLE HANDSET SPEAKER

1. Prepare the digital voltmeter, and set the selector knob to ohm meter.
2. Put the probes at the speaker terminals as shown in Fig. 47.
3.





ACCESSORIES AND PACKING MATERIALS

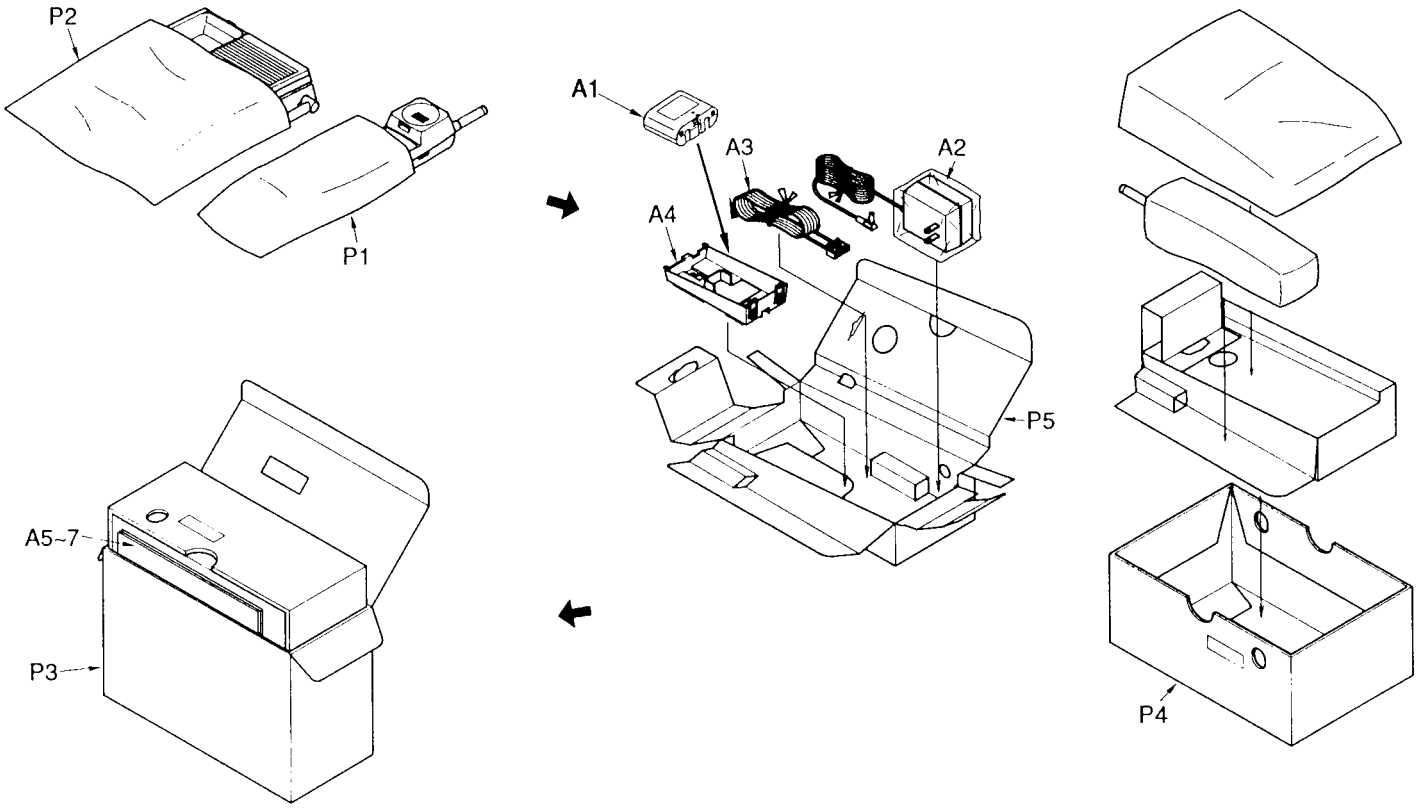
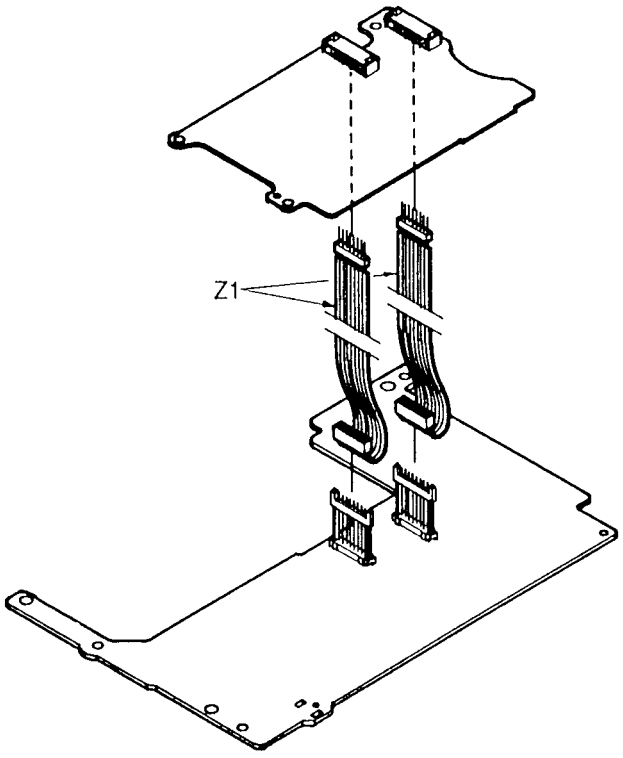
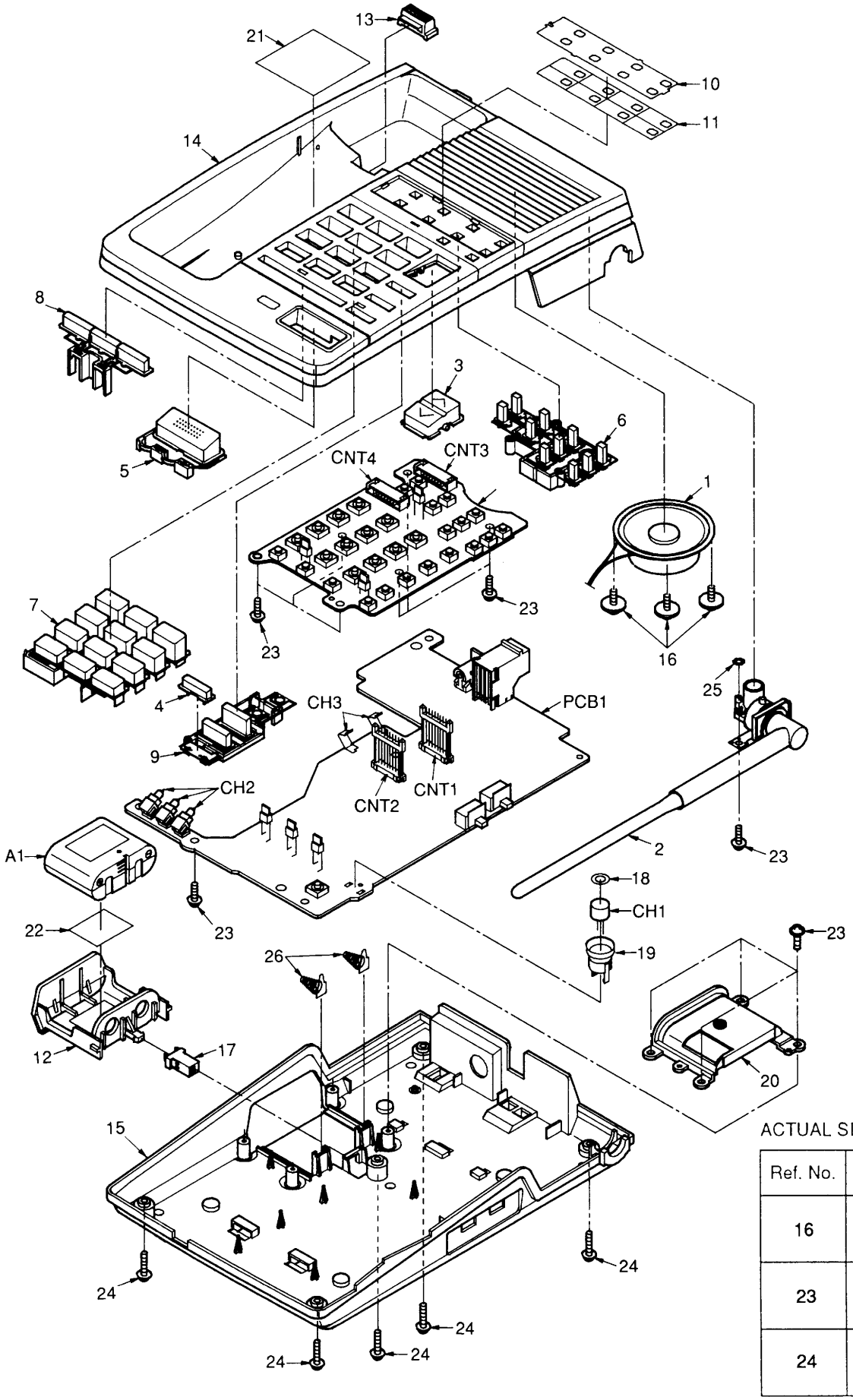


Fig. 48

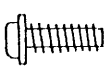
TOOLS



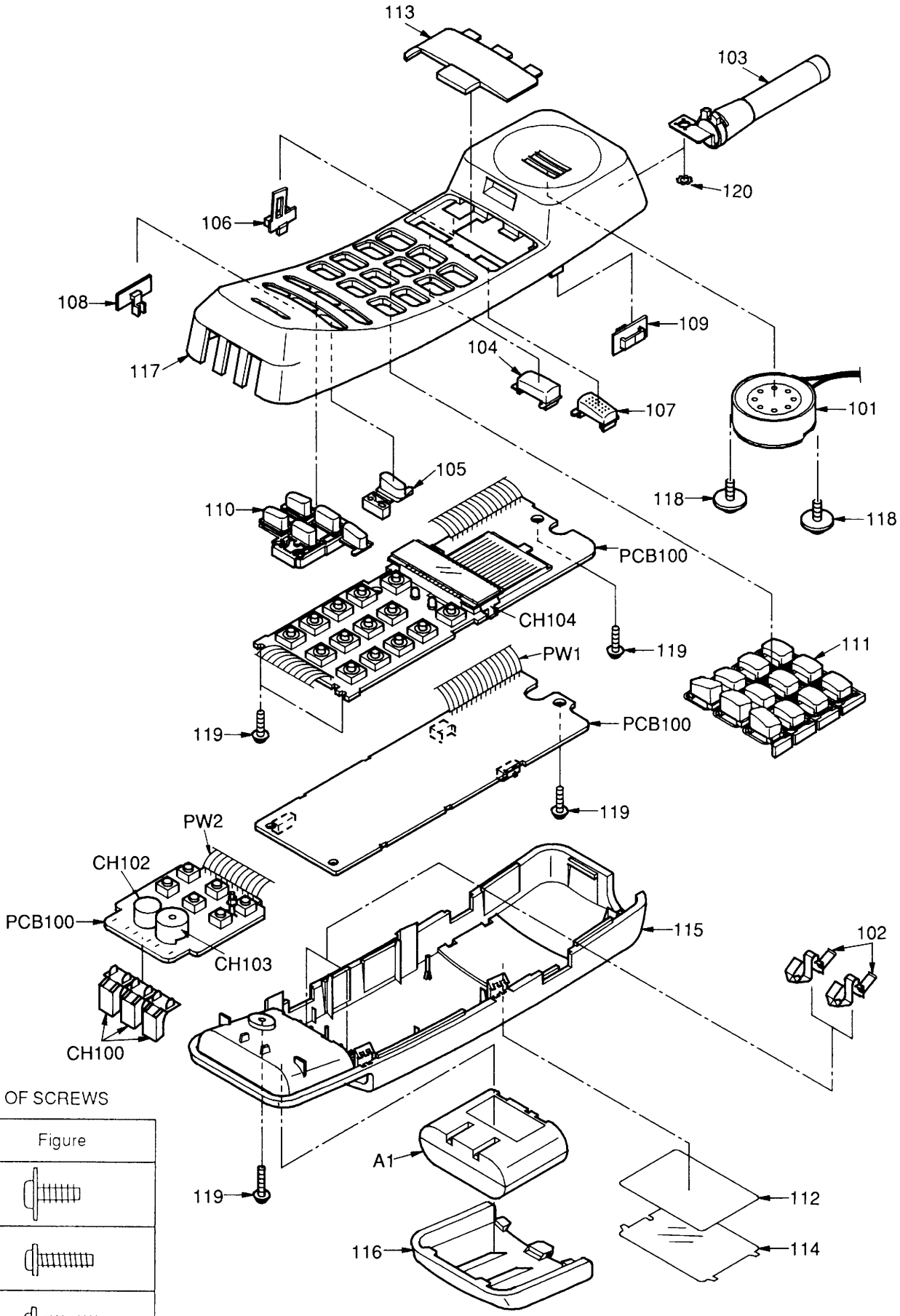
CABINET AND ELECTRICAL PARTS LOCATION (KX-T3970H)



ACTUAL SIZE OF SCREWS

Ref. No.	Figure
16	
23	
24	

CABINET AND ELECTRICAL PARTS LOCATION (KX-T3970R)



ACTUAL SIZE OF SCREWS

Ref. No.	Figure
118	
119	
120	

This replacement parts list is U.S.A. version only. Refer to the simplified manual (cover) for Canada or other areas.

REPLACEMENT PARTS LIST

Model KX-T3970H

1. RTL (Retention Time Limited)
Note: The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.
2. Important safety notice
Components identified by the ⚠ mark special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS
Unless otherwise specified.
All resistors are in ohms (Ω) K=1000Ω, M=1000KΩ
All capacitors are in MICRO FARADS (μF) P=μμF
*Type &Wattage of Resistor
Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor
Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC : Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG : Polyester
PQCUV:Chip	ECEA,ECSZ : Electrolytic
ECQMS:Mica	ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

Ref. No.	Part No.	Part Name & Description		Pcs/Set
		CABINET & ELECTRICAL PARTS		
1	PQAS5P22Z	SPEAKER		1
2	PQSA10012Z	ANTENNA		1
3	PQBC10117Z1	BUTTON	S	1
4	PQBC10118Z1	BUTTON	S	1
5	PQBC10120Z1	BUTTON	S	1
6	PQBX10179Z1	BUTTON	S	1
7	PQBX10180Z1	BUTTON	S	1
8	PQBX10181Z1	BUTTON	S	1
9	PQBX10182Z1	BUTTON	S	1
10	PQGV10025Z	TRANSPARENT PLATE		1
11	PQHP10045Z	TEL CARD		1
12	PQJB10004Z1	BATTERY CASE		1
13	PQKE10018Z1	HANGER	S	1
14	PQKM10120Z1	CABINET BODY		1
15	PQYF10051X1	CABINET PLATE		1
16	PJHE5065Z	SCREW		3
17	PQDE10011Z	LATCH		1
18	PQHG10180Z	RUBBER, MIC	S	1
19	PQHR10171Z	MIC HOLDER		1
20	PQHR10237Z	BATTERY CASE COVER		1
21	PQQT10703Z	INDICATION LABEL		1
22	PQQT10726Z	INDICATION LABEL		1
23	XTW3+S10P	SCREW		12
24	XTW3+S14P	SCREW		5
25	XWC3B	WASHER		1
26	PQUS10103Y	SPRING		2

Ref. No.	Part No.	Part Name & Description		Pcs/Set
		MAIN P.C. BOARD PARTS		
PCB 1	PQWPT3970HM	P.C.B. ASS'Y(RTL)		1
		(ICS)		
IC1	PQVISC79159A	IC		1
IC3	PQVIM64026FP	IC		1
IC4	PQVISC77655S	IC		1
IC5	MN150808KJAD	IC		1
		(TRANSISTORS)		
Q1	2SK543	TRANSISTOR(SI)		1
Q2	2SD601A	TRANSISTOR(SI) [or 2SC2412]		1
Q4	PQVTFB1A4M	TRANSISTOR(SI)		1
Q5	PQVTFB1A4M	TRANSISTOR(SI)		1
Q6	2SD601A	TRANSISTOR(SI) [or 2SC2412]		1
Q7	UN5213	TRANSISTOR(SI)	S	1
Q11	2SC2295	TRANSISTOR(SI) [or 2SC2413]	S	1
Q13	2SC2295	TRANSISTOR(SI) [or 2SC2413]	S	1
Q15	2SB709A	TRANSISTOR(SI) [or 2SA1162]	S	1
Q16	UN5213	TRANSISTOR(SI)	S	1
Q17	2SD601A	TRANSISTOR(SI) [or 2SC2412]		1
Q18	2SD601A	TRANSISTOR(SI) [or 2SC2412]		1
Q19	2SD1819A	TRANSISTOR(SI) [or2SC4081]		1
Q20	UN5213	TRANSISTOR(SI)	S	1
Q21	2SD601A	TRANSISTOR(SI) [or 2SC2412]		1
Q23	2SD1819A	TRANSISTOR(SI) [or 2SC4081]		1
Q24	2SB709A	TRANSISTOR(SI) [or 2SA1162]	S	1
Q25	2SD601A	TRANSISTOR(SI) [or 2SC2412]		1
Q26	2SD1991A	TRANSISTOR(SI)		1
Q27	2SD2136	TRANSISTOR(SI)		1
Q29	2SA933	TRANSISTOR(SI)		1
Q30	2SA933	TRANSISTOR(SI)		1
Q31	2SD601A	TRANSISTOR(SI) [or 2SC2412]		1
Q32	2SA933	TRANSISTOR(SI)		1
Q33	2SA933	TRANSISTOR(SI)		1
Q34	2SD1991A	TRANSISTOR(SI)		1
Q35	2SD601A	TRANSISTOR(SI) [or 2SC2412]		1
Q36	2SD1819A	TRANSISTOR(SI) [or 2SC4081]	⚠	1
Q38	2SD1819A	TRANSISTOR(SI) [or 2SC4081]		1
Q40	2SD1819A	TRANSISTOR(SI) [or 2SC4081]		1
Q41	2SB1218A	TRANSISTOR(SI) [or 2SB1576]		1
Q42	2SD1819A	TRANSISTOR(SI) [or 2SC4081]		1
Q43	2SD601A	TRANSISTOR(SI) [or 2SC2412]		1
Q50	2SD601A	TRANSISTOR(SI) [or 2SC2412]		1
Q101	2SD601A	TRANSISTOR(SI) [or 2SC2412]	⚠	1
Q102	2SD601A	TRANSISTOR(SI) [or 2SC2412]	⚠	1
Q103	PQVTKSD261CY	TRANSISTOR(SI)	⚠	1
Q104	2SD601A	TRANSISTOR(SI) [or 2SC2412]	⚠	1
Q105	2SA1776P	TRANSISTOR(SI) [or 2SA1625]	⚠S	1
		(DIODES)		
D3	PQVD1SV145	DIODE(SI) [or MA840A]	S	1
D4	MA840ATAKU	DIODE(SI)		1
D5	1SS120	DIODE(SI) [or 1SS131]		1
D6	1SS120	DIODE(SI) [or 1SS131]		1
D7	1SS120	DIODE(SI) [or 1SS131]		1
D8	MA700A	DIODE(SI)		1
D9	MA700A	DIODE(SI)		1
D10	MA4024	DIODE(SI)		1
D11	MA700A	DIODE(SI)		1
D12	MA4047	DIODE(SI)		1
D13	MA4110	DIODE(SI)		1
D14	1SS120	DIODE(SI) [or 1SS131]		1
D15	1SS120	DIODE(SI) [or 1SS131]		1

This replacement parts list is U.S.A. version only. Refer to the simplified manual (cover) for Canada or other areas.

Ref. No.	Part No.	Part Name & Description		Pcs/Set
D16	1SS120	DIODE(SI) [or 1SS131]		1
D17	MA4030	DIODE(SI)		1
D18	MA110	DIODE(SI)		1
D19	1SS120	DIODE(SI) [or 1SS131]		1
D22	PQVDHZS3A1	DIODE(SI)	S	1
D101	MA4036	DIODE(SI)	⚠	1
D102	MA4270	DIODE(SI)	⚠	1
D103	1SS120	DIODE(SI) [or 1SS131]		1
D106	PQVDS1ZB40F1	DIODE(SI)	⚠	1
C	1SS120	DIODE(SI) [or 1SS131]		1
E	MA110	DIODE(SI)		1
F	1SS120	DIODE(SI) [or 1SS131]		1
Q	1SS120	DIODE(SI) [or 1SS131]		1
R	1SS120	DIODE(SI) [or 1SS131]		1
IND2	LN224RP	LED		1
IND3	LN324GP	LED		1
IND4	LN224RP	LED		1
IND5	LN268RPXTAB	LED		1
IND6	LN268RPXTAB	LED		1
IND7	LN224RP	LED		1
		(JACK)		
JJ1	PQJJ2HA2Z	JACK,TEL/DC IN	⚠	1
		(SWITCHES)		
S1~12	EVQQJJ05Q	SWITCH		12
S13~20	EVQ21405R	SWITCH		8
S21,22	EVQ21405R	SWITCH		2
S23,24	EVQ21405R	SWITCH		2
S25	EVQ21405R	SWITCH		1
S26	EVQ21405R	SWITCH		1
S27	EVQ21405R	SWITCH		1
S28	EVQ21405R	SWITCH		1
S29	EVQ21405R	SWITCH		1
S30	EVQ21405R	SWITCH		1
SW1	PQSS2A27W	SWITCH		1
SW2	PQSS3A17W	SWITCH		1
SW3	PQSH1A57Z	SWITCH		1
		(COILS AND TRANSFORMERS)		
L4	ELEPK330KA	COIL		1
L5	PQLQZM1R0K	COIL		1
L6	PQLQZM1R0K	COIL		1
L7	PQLQZM1R0K	COIL		1
L8	ELEPK330KA	COIL		1
T1	PQLA7A7	COIL		1
T2	PQLA7A9	COIL		1
T4	PQLA7A22	COIL		1
T5	PQLA7A20	COIL		1
T6	PQLI2B201	I.F. TRANSFORMER		1
T7	PQLT8D4A	TRANSFORMER		1
T8	PQLT8D4A	TRANSFORMER		1
J100	ELEPK330KA	COIL		1
		(PHOTO COUPLERS)		
PC1	PQVIPC817CD	PHOTO ELECTRIC TRANSDUCER	⚠	1
PC2	PQVITLP627	PHOTO ELECTRIC TRANSDUCER	⚠	1
PC3	PQVIPC814K	PHOTO ELECTRIC TRANSDUCER	⚠	1
		(CERAMIC FILTERS)		
CF1	PQVFCFW455E	CERAMIC FILTER	S	1
CF2	RVFSFE107MSR	CERAMIC FILTER	S	1

Ref. No.	Part No.	Part Name, Description & Value		Pcs/Set
		(CRYSTALS)		
X1	PQVCJ10240C5	CRYSTAL OSCILLATOR		1
X2	PQVCJ3581N9Z	CRYSTAL OSCILLATOR		1
		(OTHERS)		
CH1	PQJM120Z	MICROPHONE		1
CH2	PQJT10050Z	CHARGE TERMINAL		3
CH3	PQJT10004Z	CHARGE TERMINAL		2
CNT1	PQJP08A74Z	CONNECTOR		1
CNT2	PQJP08A73Z	CONNECTOR		1
CNT3	PQJS08A36Z	CONNECTOR		1
CNT4	PQJS08A36Z	CONNECTOR		1
TC1	ECRLA030E53	TRIMMER CAPACITOR		1
DUP1	PQVFDX4649B1	CERAMIC FILTER		1
PO1	PQRPAR390N	THERMISTOR	⚠	1
SA1	PQVDDSS301L	VARISTOR	⚠	1
SA2	PQVDDSA242MU	VARISTOR	⚠	1
VR	EVNDXAA03B35	VARIABLE RESISTOR		1
		(RESISTORS)		
R1	PQ4R18XJ471	470		1
R2	ERJ3GEYJ000	0		1
R4	ERJ3GEYJ273	27K		1
R5	ERJ3GEYJ105	1M		1
R6	ERJ3GEYJ000	0		1
R7	ERJ3GEYJ123	12K		1
R9	PQ4R10XJ184	180K		1
R10	ERJ3GEYJ334	330K		1
R12	ERJ3GEYJ103	10K		1
R15	ERJ3GEYJ220	22		1
R19	ERJ3GEYJ223	22K		1
R20	ERJ3GEYJ473	47K		1
R21	ERJ3GEYJ103	10K		1
R22	ERJ3GEYJ153	15K		1
R23	ERJ3GEYJ153	15K		1
R24	ERJ3GEYJ000	0		1
R25	ERJ3GEYJ103	10K		1
R26	ERJ3GEYJ104	100K		1
R27	ERJ3GEYJ333	33K		1
R28	ERJ3GEYJ102	1K		1
R29	ERJ3GEYJ152	1.5K		1
R31	ERJ3GEYJ104	100K		1
R32	ERJ3GEYJ103	10K		1
R33	ERJ3GEYJ000	0		1
R34	ERJ3GEYJ000	0		1
R35	ERJ3GEYJ104	100K		1
R36	ERJ3GEYJ683	68K		1
R37	ERJ3GEYJ683	68K		1
R38	PQ4R10XJ682	6.8K		1
R40	PQ4R10XJ104	100K		1
R41	ERJ3GEYJ220	22		1
R44	ERJ3GEYJ122	1.2K		1
R45	ERJ3GEYJ223	22K		1
R46	ERJ3GEYJ223	22K		1
R47	PQ4R18XJ104	100K		1
R48	ERJ3GEYJ473	47K		1
R49	ERJ3GEYJ000	0		1
R50	ERJ3GEYJ224	220K		1
R51	ERJ3GEYJ000	0		1
R52	ERJ3GEYJ472	4.7K		1
R54	ERJ3GEYJ331	330		1
R55	ERJ3GEYJ000	0		1
R56	ERJ3GEYJ104	100K		1
R57	ERJ3GEYJ104	100K		1
R58	ERJ3GEYJ105	1M		1
R59	ERJ3GEYJ331	330		1
R60	ERJ3GEYJ273	27K		1

This replacement parts list is U.S.A. version only. Refer to the simplified manual (cover) for Canada or other areas.

Ref. No.	Part No.	Value	Pcs/Set
R61	ERJ3GEYJ823	82K	1
R62	ERJ3GEYJ393	39K	1
R63	ERJ3GEYJ184	180K	1
R64	ERJ3GEYJ223	22K	1
R65	ERJ3GEYJ103	10K	1
R66	ERJ3GEYJ000	0	1
R67	ERJ3GEYJ563	56K	1
R68	ERJ3GEYJ561	560	1
R69	PQ4R10XJ103	10K	1
R70	ERJ3GEYJ000	0	1
R71	ERJ3GEYJ473	47K	1
R72	ERJ3GEYJ560	56	1
R73	ERJ3GEYJ562	5.6K	1
R74	ERJ3GEYJ102	1K	1
R75	ERJ3GEYJ392	3.9K	1
R76	ERJ3GEYJ273	27K	1
R77	ERJ3GEYJ000	0	1
R78	ERJ3GEYJ331	330	1
R79	ERJ3GEYJ562	5.6K	1
R81	ERDS2TJ223	22K ⚠	1
R82	ERJ3GEYJ472	4.7K ⚠	1
R100	ERJ3GEYJ332	3.3K	1
R101	ERJ3GEYJ332	3.3K	1
R102	ERJ3GEYJ273	27K	1
R103	ERJ3GEYJ104	100K	1
R105	ERJ3GEYJ225	2.2M	1
R106	ERJ3GEYJ821	820	1
R107	ERJ3GEYJ275	2.7M	1
R108	ERJ3GEYJ104	100K	1
R109	ERJ3GEYJ472	4.7K	1
R110	ERJ3GEYJ222	2.2K	1
R111	ERJ3GEYJ223	22K	1
R112	ERJ3GEYJ104	100K	1
R113	ERJ3GEYJ223	22K	1
R114	ERJ3GEYJ104	100K	1
R115	ERJ3GEYJ822	8.2K	1
R116	ERJ3GEYJ683	68K	1
R117	ERJ3GEYJ104	100K	1
R118	ERJ3GEYJ822	8.2K	1
R119	ERDS2TJ682	6.8K	1
R120	ERJ3GEYJ564	560K	1
R122	ERJ3GEYJ823	82K	1
R123	ERJ3GEYJ822	8.2K	1
R124	ERJ3GEYJ822	8.2K	1
R125	ERJ3GEYJ563	56K	1
R126	ERJ3GEYJ824	820K	1
R127	ERJ3GEYJ332	3.3K	1
R128	ERJ3GEYJ333	33K	1
R129	PQ4R10XJ473	47K	1
R130	ERJ3GEYJ221	220	1
R131	ERJ3GEYJ393	39K	1
R132	ERJ3GEYJ823	82K	1
R133	ERJ3GEYJ473	47K	1
R134	ERJ3GEYJ103	10K	1
R135	ERJ3GEYJ103	10K	1
R136	ERJ3GEYJ103	10K	1
R140	ERJ3GEYJ272	2.7K	1
R141	ERJ3GEYJ271	270	1
R143	ERDS2TJ224	220K	1
R145	ERJ3GEYJ124	120K	1
R146	ERJ3GEYJ563	56K	1
R147	ERJ3GEYJ273	27K	1
R148	ERJ3GEYJ153	15K	1
R149	ERDS2TJ224	220K	1
R150	ERD25TJ221	220	1
R151	ERJ3GEYJ222	2.2K	1
R153	ERDS2TJ121	120	1
R154	ERDS2TJ181	180	1
R155	ERJ3GEYJ103	10K	1
R156	ERJ3GEYJ103	10K	1
R157	ERDS2TJ473	47K	1

Ref. No.	Part No.	Value	Pcs/Set
R158	ERJ3GEYJ103	10K	1
R159	ERJ3GEYJ102	1K	1
R160	ERDS2TJ680	68	1
R161	ERDS2TJ680	68	1
R162	ERDS2TJ103	10K	1
R163	ERJ3GEYJ103	10K	1
R164	ERJ3GEYJ153	15K	1
R165	ERJ3GEYJ473	47K	1
R166	ERJ3GEYJ222	2.2K	1
R169	ERJ3GEYJ333	33K	1
R170	ERJ3GEYJ104	100K	1
R171	ERJ3GEYJ221	220	1
R172	ERJ3GEYJ104	100K	1
R173	ERJ3GEYJ473	47K	1
R174	ERJ3GEYJ473	47K	1
R175	ERJ3GEYJ104	100K	1
R176	ERJ3GEYJ824	820K	1
R177	ERJ3GEYJ104	100K	1
R178	ERJ3GEYJ271	270	1
R179	ERJ3GEYJ102	1K	1
R180	ERJ3GEYJ102	1K	1
R190	ERJ3GEYJ473	47K	1
R191	ERJ3GEYJ103	10K	1
R192	ERJ3GEYJ393	39K	1
R200	ERJ3GEYJ102	1K ⚠	1
R201	ERJ3GEYJ272	2.7K ⚠	1
R202	ERJ3GEYJ105	1M ⚠	1
R203	ERDS2TJ680	68 ⚠	1
R204	ERDS2TJ120	12 ⚠	1
R205	ERJ3GEYJ182	1.8K ⚠	1
R206	ERJ3GEYJ102	1K ⚠	1
R207	ERJ3GEYJ222	2.2K ⚠	1
R208	ERJ3GEYJ122	1.2K ⚠	1
R209	ERJ3GEYJ223	22K ⚠	1
R211	ERJ3GEYJ220	22 ⚠	1
R212	ERDS2TJ331	330 ⚠	1
R213	ERJ3GEYJ821	820 ⚠	1
R214	ERJ3GEYJ682	6.8K ⚠	1
R215	PQ4R10XJ391	390 ⚠	1
R216	ERDS2TJ150	15 ⚠	1
R217	ERDS2TJ102	1K ⚠	1
R218	ERJ3GEYJ682	6.8K ⚠	1
R219	ERJ3GEYJ154	150K ⚠	1
R220	ERJ3GEYJ273	27K ⚠	1
R222	ERJ3GEYJ472	4.7K ⚠	1
R223	ERJ3GEYJ104	100K ⚠	1
R224	ERDS2TJ473	47K ⚠	1
R225	ERJ3GEYJ184	180K	1
R230	ERJ3GEYJ471	470	1
R300	ERD25TJ103	10K	1
R301	ERDS2TJ271	270	1
R302	ERDS2TJ271	270	1
R303	PQ4R10XJ271	270	1
R305	ERDS2TJ104	100K	1
R306	ERJ3GEYJ104	100K	1
R307	ERJ3GEYJ124	120K	1
R402	ERJ3GEYJ223	22K	1
		(CAPACITORS)	
C0	ECKDKC222KB	0.0022 S	1
C1	ECUV1H103KB	0.01 S	1
C2	ERJ3GEYJ000	0	1
C4	ECUV1H103KBV	0.01 S	1
C5	PQCUV1E104MD	0.1 S	1
C6	ECUV1H104ZFV	0.1 S	1
C7	ECEA1HKS010	1	1

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Ref. No.	Part No.	Value		Pcs/Set
C9	PQCUV1E104MD	0.1	S	1
C10	PQCUV1C683MD	0.068		1
C11	ECUV1H103KBV	0.01	S	1
C12	ECUV1H104ZFV	0.1	S	1
C13	ECUV1H103KBV	0.01	S	1
C14	ECEA1CKS100	10	S	1
C15	PQCUV1E104MD	0.1	S	1
C16	ECUV1H223KBV	0.022	S	1
C17	ECUV1H150JCV	15P		1
C18	ECUV1H472KBV	0.0047		1
C19	ECUV1H470JCV	47P		1
C21	ECUV1C224ZFV	0.22		1
C22	ECEA1HKS010	1		1
C24	PQCUV1E104MD	0.1	S	1
C25	PQCUV1E104MD	0.1	S	1
C26	PQCUV1E104MD	0.1	S	1
C27	PQCUV1E104MD	0.1	S	1
C28	ECUV1H104ZFV	0.1	S	1
C29	PQCUV1E104MD	0.1	S	1
C30	PQCUV1E104MD	0.1	S	1
C31	PQCUV1E104MD	0.1	S	1
C32	PQCUV1E104MD	0.1	S	1
C33	PQCUV1H105JC	1	S	1
C34	ECEA1HKS010	1		1
C35	ECEA1CK101	100	S	1
C36	PQCUV1E104MD	0.1	S	1
C37	PQCUV1E104MD	0.1	S	1
C38	PQCUV1H220JC	22P		1
C40	PQCUV1E104MD	0.1		1
C41	PQCUV1E104MD	0.1		1
C43	ECEA1CK101	100	S	1
C45	ECEA1CKS100	10	S	1
C47	ECEA1HKS010	1		1
C48	ECEA1CKS100	10		1
C49	ECUV1H104ZFV	0.1	S	1
C50	PQCUV1E104MD	0.1		1
C51	ECUV1H822KBV	0.0082		1
C52	PQCUV1E104MD	0.1	S	1
C53	PQCUV1H183KB	0.018	S	1
C54	ECUV1H104ZFV	0.1	S	1
C55	ECEA1HKS010	1		1
C59	ECUV1H104MD	0.1	S	1
C60	PQCUV1H683MD	0.068	S	1
C61	PQCUV1E104MD	0.1		1
C62	PQCUV1C683MD	0.068		1
C64	ECEA1HKS010	1		1
C65	ECEA1HKS010	1		1
C66	ECEA1CKS470	47	S	1
C67	ECEA1VKS4R7	4.7	S	1
C68	PQCUV1C683MD	0.068		1
C69	PQCUV1E104MD	0.1	S	1
C70	PQCUV1E104MD	0.1		1
C72	ECEA1CKS100	10		1
C73	ECEA1VKS4R7	4.7	S	1
C74	ECEA1CKS470	47	S	1
C75	ECEA1AKA221	220	S	1
C76	PQCUV1E104MD	0.1	S	1
C77	ECEA1HKS010	1		1
C78	ECEA1CK101	100		1
C79	ECEA1CU102	1000		1
C80	PQCUV1E104MD	0.1		1
C81	PQCUV1E473MD	0.047		1
C82	ECUV1H820JCV	82P		1
C85	ECUV1H152KBV	0.0015		1
C86	PQCUV1H682KB	0.0068		1
C87	ECUV1H271JCV	270P		1
C88	ECUV1H104ZFV	0.1	S	1
C90	PQCUV1E104MD	0.1	S	1
C91	PQCUV1E104MD	0.1	S	1
C92	ECUV1H104ZFV	0.1	S	1
C93	ECUV1H222KBV	0.0022		1

Ref. No.	Part No.	Value		Pcs/Set
C94	ECUV1H223KBV	0.022	S	1
C95	ECUV1H682KBV	0.0068		1
C100	PQCUV1E104MD	0.1	S	1
C101	PQCUV1E104MD	0.1	S	1
C102	ECUV1H220JCV	22P		1
C103	ECUV1H220JCV	22P		1
C104	PQCUV1H105JC	1	S	1
C105	PQCUV1C224ZF	0.22		1
C106	ECEA0JU102	1000		1
C107	ECEA1AU101	100	S	1
C108	PQCUV1H103KB	0.01	S	1
C109	ECEA1CU221	220		1
C110	ECUV1H103KBV	0.01	S	1
C111	PQCUV1H103KB	0.01	S	1
C113	ECEA0JU102	1000		1
C120	PQCUV1H220JC	22P		1
C124	PQCUV1H220JC	22P		1
C127	ECUV1H220JCV	22P	⚠	1
C128	PQCUV1H103KB	0.01	S	1
C129	ECUV1H470JCV	47P		1
C130	ECUV1H680JCV	68P		1
C131	ECUV1H330JCV	33P		1
C132	ECUV1H220JCV	22P		1
C133	ECUV1H220JCV	22P		1
C134	PQCUV1H030CC	3P		1
C135	ECUV1H681JCV	680P	S	1
C136	ECUV1H102KBV	0.001		1
C137	ECUV1H104ZFV	0.1		1
C138	PQCUV1C224ZF	0.22		1
C139	PQCUV1E104MD	0.1	S	1
C140	ECUV1H122KBV	0.0012		1
C141	ECUV1H221JCV	220P		1
C150	PQCUV1E104MD	0.1	S	1
C151	ECUV1H103KBV	0.01	S	1
C152	ECUV1H104ZFV	0.1	S	1
C153	ECUV1H104ZFV	0.1	S	1
C154	ECUV1H104ZFV	0.1	S	1
C157	ECUV1H104ZFV	0.1	S	1
C158	ECUV1H104ZFV	0.1	S	1
C159	ECUV1H104ZFV	0.1	S	1
C160	PQCUV1E104MD	0.1	S	1
C162	ECUV1H104ZFV	0.1	⚠S	1
C202	ECEA1HU100	10	⚠S	1
C203	PQCUV1E104MD	0.1	⚠	1
C204	ECEA1CKS470	47	⚠S	1
C205	PQCUV1H333JC	0.033	⚠S	1
C206	ECEA1HU100	10	⚠S	1
C207	ECEA1CK101	100	⚠S	1
C208	PQCUV1E104MD	0.1	⚠S	1
C209	ECUV1H104ZFV	0.1	⚠S	1
C210	ECEA1HU100	10	⚠S	1
C212	ECEA1EU470	47	⚠S	1
C213	ECEA1HKS2R2	2.2	⚠	1
C214	ECUV1H103KBV	0.01	⚠S	1
C216	ECKD2H681KB	680P	⚠S	1
C217	ECKD2H681KB	680P	S	1
C218	ECQE2224KF	0.22	⚠	1
C219	ECUV1H331JCV	330P	S	1
C221	ECEA1HKS010	1		1
C301	PQCUV1E104MD	0.1	S	1

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REPLACEMENT PARTS LIST

Model KX-T3970R

1. RTL (Retention Time Limited)

Note: The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

2. Important safety notice

Components identified by the ⚠ mark special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

3. The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS

Unless otherwise specified.

All resistors are in ohms (Ω) K=1000Ω, M=1000KΩ

All capacitors are in MICRO FARADS (μF) P=μμF

*Type &Wattage of Resistor

Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC : Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG : Polyester
PQCUV:Chip	ECEA,ECSZ : Electrolytic
ECQMS:Mica	ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

Ref. No.	Part No.	Part Name & Description		Pcs/Set
		CABINET & ELECTRICAL PARTS		
101	PQAX3P16Z	SPEAKER		1
102	PQJC10015Z	CHARGE TERMINAL		2
103	PQSA10013Z	ANTENNA		1
104	PQBC10082Z1	BUTTON	S	1
105	PQBC10083Z1	BUTTON	S	1
106	PQBC10084Z1	BUTTON	S	1
107	PQBC10091Z1	BUTTON	S	1
108	PQBD10022Z1	KNOB	S	1
109	PQBD10031Z1	KNOB		1
110	PQBX10131Z1	BUTTON	S	1
111	PQBX10191Z1	BUTTON	S	1
112	PQGD10115Z	TEL CARD		1
113	PQGP10049W	PANEL		1
114	PQGV10021Z	TRANSPARENT PLATE		1
115	PQKF10062X1	CABINET PLATE		1
116	PQKK10021Y1	BATTERY COVER		1
117	PQKM10076T1	CABINET BODY		1
118	PJHE5065Z	SCREW		2
119	XTW26+10E	SCREW		5
120	XWC4B	WASHER		1

Ref. No.	Part No.	Part Name & Description		Pcs/Set
		MAIN P.C. BOARD PARTS		
PCB100	PQWPT3970RM	P.C.B. ASS'Y(RTL)		1
		(ICS)		
IC1	PQVIXC79159	IC		1
IC2	PQVIM64026FP	IC		1
IC101	PQVI402945FU	IC		1
IC102	PQVISC78184D	IC		1
		(TRANSISTORS0		
Q1	2SK543	TRANSISTOR(SI)		1
Q2	2SC2295	TRANSISTOR(SI) [or 2SC2413K]	S	1
Q3	2SC2412K	TRANSISTOR(SI)		1
Q4	2SC2295	TRANSISTOR(SI) [or 2SC2413K]	S	1
Q101	XN1116	TRANSISTOR(SI)		1
Q102	2SA1036KQ146	TRANSISTOR(SI)	S	1
Q103	2SD601R	TRANSISTOR(SI) [or 2SC2712G]		1
Q104	2SD601R	TRANSISTOR(SI) [or 2SC2712G]		1
Q105	2SD601R	TRANSISTOR(SI) [or 2SC2712G]		1
Q106	2SD601R	TRANSISTOR(SI) [or 2SC2712G]		1
Q107	2SB709A	TRANSISTOR(SI) [or 2sa1162G]	S	1
Q108	2SD601R	TRANSISTOR(SI) [or 2SC2712G]		1
Q109	2SD601R	TRANSISTOR(SI) [or 2SC2712G]		1
Q110	2SD601R	TRANSISTOR(SI) [or 2SC2712G]		1
		(DIODES)		
D1	MA840BTAKU	DIODE(SI)		1
D3	PQVD1SV145	DIODE(SI)		1
D101	MA728	DIODE(SI)		1
D102	MA700A	DIODE(SI)		1
D103	PQVDSLC22MG1	LED		1
D104	PQVDSLR33MC3	LED		1
D105	PQVDSLR33MC3	LED		1
D106	1SS120	DIODE(SI) [or 1SS131]		1
D107	1SS120	DIODE(SI) [or 1SS131]		1
D108	1SS120	DIODE(SI) [or 1SS131]		1
D109	1SS120	DIODE(SI) [or 1SS131]		1
D110	1SS120	DIODE(SI) [or 1SS131]		1
		(SWITCHES)		
S1	ESD11H120	SWITCH		1
S2	PQSH1A44Z	SWITCH		1
S3	ESD11H120	SWITCH		1
S101	PQSH1A57Z	SWITCH		1
S102	PQSH1A57Z	SWITCH		1
S103	EVQQJJ05Q	SWITCH		1
S104	EVQQJJ05Q	SWITCH		1
S105	EVQQJJ05Q	SWITCH		1
S106	EVQQJJ05Q	SWITCH		1
S107	EVQQJJ05Q	SWITCH		1
S108	EVQQJJ05Q	SWITCH		1
S109	EVQQJJ05Q	SWITCH		1
S110	EVQQJJ05Q	SWITCH		1
S111	EVQQJJ05Q	SWITCH		1
S112	EVQQJJ05Q	SWITCH		1
S113	EVQQJJ05Q	SWITCH		1
S114	EVQQJJ05Q	SWITCH		1
S116	EVQ21404M	SWITCH		1
S117	EVQ21404M	SWITCH		1
S118	EVQ21404M	SWITCH		1
S119	EVQ21404M	SWITCH		1
S120	EVQ21404M	SWITCH		1
S121	EVQ21404M	SWITCH		1

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Ref. No.	Part No.	Part Name, Description & Value		Pcs/Set
		(COILS AND TRANSFORMERS)		
L1	PQLQZM100K	COIL		1
L2	PQLQZM1R5K	COIL		1
L102	PQLQZM1R0K	COIL		1
L103	PQLQZM1R0K	COIL		1
T1	PQLA7A9	COIL		1
T2	PQLI2B201	I.F. TRANSFORMER		1
T3	PQLA7A11	COIL		1
T4	PQLA7A22	COIL		1
T5	PQLA7A7	COIL		1
		(CRYSTALS)		
X1	PQVCJ10240C5	CRYSTAL OSCILLATOR		1
X2	PQVCJ3581N9Z	CRYSTAL OSCILLATOR		1
X101	PQVBB1216J	CERAMIC FILTER		1
X102	PQVCL3276N9Z	CRYSTAL OSCILLATOR		1
		(VARIABLE RESISTORS)		
VR2	EVNDXAA03B35	VARIABLE RESISTOR		1
VR3	EVNDXAA03B35	VARIABLE RESISTOR		1
		(CERAMIC FILTERS)		
CF1	PQVFCFW455E	CERAMIC FILTER		1
CF2	RVFSFE107MSR	CERAMIC FILTER	S	1
		(OTHERS)		
CH100	PQJT10039Z	CHARGE TERMINAL		3
CH102	PQJM124Z	MICROPHONE		1
CH103	PQEFBC12GP03	BUZZER	S	1
CH104	PQHR10238Z	LCD HOLDER		1
TC1	ECRLA030E53	TRIMMER CAPACITOR		1
DUP1	ELB4Z003S	DUPLEX		1
LCD	PQADB5507AZ1	LIQUID CRYSTAL DISPLAY		1
PW2	WBJ11SH-4SS	LEAD WIRE		1
PW1	WBX19SH-3SS	LEAD WIRE		1
		(RESISTORS)		
R1	ERJ3GEYJ333	33K		1
R2	ERJ3GEYJ152	1.5K		1
R3	ERJ3GEYJ102	1K		1
R4	ERJ3GEYJ152	1.5K		1
R5	ERJ3GEYJ333	33K		1
R6	ERDS2TJ334	330K		1
R7	ERJ3GEYJ154	150K		1
R8	ERJ3GEYJ474	470K		1
R9	ERJ3GEYJ334	330K		1
R10	ERJ3GEYJ562	5.6K		1
R11	ERJ3GEYJ000	0		1
R12	ERJ3GEYJ000	0		1
R13	ERJ3GEYJ182	1.8K		1
R14	ERJ3GEYJ331	330		1
R16	ERJ3GEYJ224	220K		1
R17	ERJ3GEYJ823	82K		1
R18	ERJ3GEYJ104	100K		1
R19	PQ4R10XJ273	27K		1
R20	PQ4R10XJ220	22		1
R21	PQ4R10XJ331	330		1
R24	ERJ3GEYJ223	22K		1
R25	ERDS2TJ223	22K		1
R26	ERJ3GEYJ393	39K		1
R27	ERJ3GEYJ393	39K		1

Ref. No.	Part No.	Value	Pcs/Set
R28	ERJ3GEYJ393	39K	1
R29	ERDS2TJ104	100K	1
R30	ERJ3GEYJ000	0	1
R31	PQ4R10XJ220	22	1
R32	PQ4R10XJ154	150K	1
R34	PQ4R10XJ470	47	1
R35	PQ4R10XJ393	39K	1
R37	PQ4R10XJ470	47	1
R38	PQ4R10XJ220	22	1
R39	PQ4R10XJ223	22K	1
R40	PQ4R10XJ561	560	1
R41	PQ4R10XJ223	22K	1
R43	ERJ3GEYJ104	100K	1
R44	ERJ3GEYJ223	22K	1
R45	ERJ3GEYJ562	5.6K	1
R47	ERJ3GEYJ000	0	1
R48	ERJ3GEYJ224	220K	1
R49	ERJ3GEYJ103	10K	1
R50	ERJ3GEYJ684	680K	1
R51	PQ4R10XJ105	1M	1
R101	ERJ3GEYJ334	330K	1
R102	ERJ3GEYJ334	330K	1
R103	ERJ3GEYJ334	330K	1
R104	ERJ3GEYJ473	47K	1
R105	ERJ3GEYJ473	47K	1
R106	ERJ3GEYJ473	47K	1
R109	ERJ3GEYJ103	10K	1
R110	PQ4R10XJ681	680	1
R111	ERJ3GEYJ681	680	1
R112	PQ4R10XJ681	680	1
R113	ERJ3GEYJ332	3.2K	1
R114	ERDS2TJ563	56K	1
R115	ERJ3GEYJ820	82	1
R116	ERJ3GEYJ122	1.2K	1
R117	PQ4R18XJ102	1K	1
R118	PQ4R10XJ103	10K	1
R120	ERJ3GEYJ221	220	1
R121	ERJ3GEYJ104	100K	1
R125	PQ4R10XJ563	56K	1
R126	ERJ3GEYJ472	4.7K	1
R127	ERJ3GEYJ103	10K	1
R128	ERJ3GEYJ223	22K	1
R129	ERJ3GEYJ223	22K	1
R130	ERJ3GEYJ122	1.2K	1
R131	PQ4R10XJ332	3.3K	1
R132	ERJ3GEYJ122	1.2K	1
R138	PQ4R10XJ120	12	1
R140	ERJ3GEYJ103	10K	1
R141	ERJ3GEYJ334	330K	1
R142	ERJ3GEYJ334	330K	1
R143	ERJ3GEYJ106	10M	1
R144	ERJ3GEYJ334	330K	1
R145	ERJ3GEYJ223	22K	1
R146	ERJ3GEYJ474	470K	1
R147	ERJ3GEYJ103	10K	1
R148	ERJ3GEYJ105	1M	1
R153	PQ4R10XJ104	100K	1
J7	PQ4R10XJ000	0	1
J8	PQ4R10XJ000	0	1
J9	PQ4R10XJ000	0	1
J131	PQ4R10XJ000	0	1
J132	PQ4R10XJ000	0	1
J134	PQ4R18XJ000	0	1
J135	PQ4R10XJ000	0	1
J150	PQ4R18XJ000	0	1
J151	PQ4R18XJ000	0	1
J152	PQ4R18XJ000	0	1
J154	PQ4R18XJ000	0	1
J155	PQ4R18XJ000	0	1
J156	PQ4R18XJ000	0	1

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Ref. No.	Part No.	Value		Pcs/Set
J157	PQ4R18XJ000	0		1
J159	PQ4R10XJ000	0		1
J160	PQ4R18XJ000	0		1
J162	PQ4R18XJ000	0		1
J190	ERDS2TJ103	0		1
J191	ERDS2TJ103	0		1
J192	ERDS2TJ103	0		1
J224	PQ4R18XJ000	0		1
J225	ERJ3GEYJ0R00	0		1
J226	PQ4R18XJ000	0		1
J227	ERJ3GEYJ0R00	0		1
J228	PQ4R10XJ000	0		1
J239	PQ4R18XJ000	0		1
		(CAPACITORS)		
C1	PQCUV1H103KB	0.01	S	1
C2	PQCUV1H103KB	0.01	S	1
C3	ECEA1CKS100	10		1
C4	PQCUV1E104MD	0.1	S	1
C5	PQCUV1H223KB	0.022	S	1
C6	PQCUV1H150JC	15P		1
C7	PQCUV1E104MD	0.1	S	1
C8	PQCUV1E104MD	0.1	S	1
C9	PQCUV1E104MD	0.1	S	1
C10	PQCUV1E104MD	0.1	S	1
C12	ECEA1HKS010	1		1
C13	PQCUV1E104MD	0.1	S	1
C14	PQCUV1H103KB	0.01	S	1
C15	ECUV1H822KBV	0.0082		1
C16	ECEA0GKS470	47		1
C17	PQCUV1H102J	0.001	S	1
C19	ECUV1H390JCV	39P		1
C20	PQCUV1H472KB	0.0047	S	1
C21	PQCUV1H103KB	0.01	S	1
C22	PQCUV1E104MD	0.1	S	1
C23	PQCUV1E104MD	0.1	S	1
C24	PQCUV1E104MD	0.1	S	1
C25	PQCUV1H103KB	0.01	S	1
C26	ECEA1HKS010	1		1
C27	PQCUV1E104MD	0.1	S	1
C28	PQCUV1H103KB	0.01	S	1
C30	ECEA1HKSR47	0.47		1
C32	ECEA1CKS100	10		1
C33	ECEA1AKS330	33	S	1
C34	PQCUV1C683MD	0.068		1
C35	PQCUV1E104MD	0.1	S	1
C36	PQCUV1C683MD	0.068		1
C37	ECUV1H103KBV	0.01	S	1
C39	PQCUV1H220JC	22P		1
C40	PQCUV1H103KB	0.01	S	1
C41	PQCUV1H103KB	0.01	S	1
C42	PQCUV1H220JC	22P		1
C43	PQCUV1H103KB	0.01	S	1
C46	PQCUV1H220JC	22P		1
C47	PQCUV1H103KB	0.01	S	1
C48	PQCUV1H470JC	47P		1
C49	PQCUV1H680JC	68P		1
C50	PQCUV1H330JC	33P	S	1
C51	PQCUV1H150JC	15P		1
C53	PQCUV1H180JC	18P	S	1
C54	ECUV1H030CCV	3P		1
C55	ECUV1H102KBV	0.001		1
C56	PQCUV1H223KB	0.022	S	1
C57	PQCUV1H100DC	10P		1
C58	PQCUV1E104MD	0.1	S	1
C59	ECUV1H104ZFV	0.1	S	1
C60	PQCUV1E104MD	0.1	S	1
C61	PQCUV1E104MD	0.1	S	1
C62	ECUV1H103KBV	0.01		1

Ref. No.	Part No.	Value		Pcs/Set
C70	PQCUV1H181JC	180P		1
C101	ECUV1H221JCV	220P		1
C102	ECUV1H221JCV	220P		1
C104	ECUV1H180JCV	18P		1
C105	ECUV1H180JCV	18P		1
C106	PQCUV1H103KB	0.01	S	1
C107	ECEA0GKS221	220		1
C108	PQCUV1E104MD	0.1	S	1
C109	PQCUV1H103KB	0.01	S	1
C112	ECEA1CKS100	10	S	1
C113	PQCUV1H105JC	1	S	1
C114	PQCUV1H103KB	0.01	S	1
C300	ECUV1H103KBV	0.01		1
C301	ECUV1H104ZFV	0.1	S	1
C302	ECUV1H103KBV	0.01		1
C303	ECUV1H104ZFV	0.1	S	1

This replacement parts list is U.S.A. version only. Refer to the simplified manual (cover) for Canada or other areas.

KX-T3970			
Ref. No.	Part No.	Part Name & Description	Pcs/Set
		ACCESSORIES AND PACKING MATERIALS	
A1	KX-A150	RECHARGEABLE BATTERY	2
A2	KX-A11-5	AC ADAPTOR ⚠S	1
A3	PQJA59V	TELEPHONE CORD	1
A4	PQKL25Y1	WALL MOUNT BRACKET	1
A5	PQQX10550Z	INSTRUCTION BOOK	1
A6	PQQW10489Z	INSTRUCTION BOOK (QUICK REFERENCE) [ENGLISH]	1
A7	PQQW10490Z	INSTRUCTION BOOK (QUICK REFERENCE) [SPANISH]	1
P1	PQPP94Y	PROTECTION COVER (for HANDSET)	1
P2	PQPH89Y	PROTECTION COVER (for BASE UNIT)	1
P3	PQPK10705Z	GIFT BOX	1
P4	PQPN10277Z	PAD	1
P5	PQPN10278Z	ACCESSORY BOX	1
		TOOL	
Z1	PQZZ8K11Z	EXTENSION CORD, 8P	1

Note:

1. PQZZ8K11Z is useful for servicing.
(They make servicing easy).