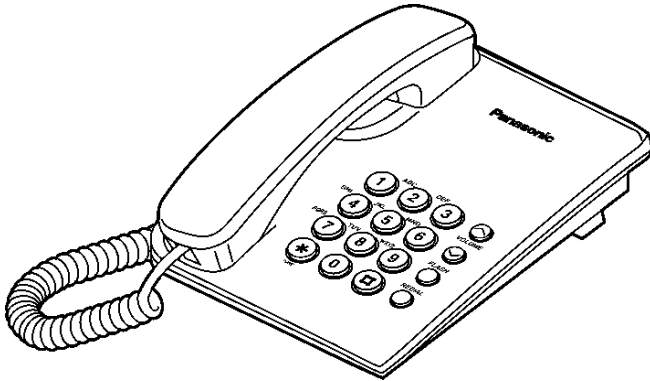


Service Manual

Telephone Equipment



KX-TS500FXB
KX-TS500FXC
KX-TS500FXH
KX-TS500FXR
KX-TS500FXW

Integrated Telephone System

Black Version

Blue Version

Gray Version

Red Version

White Version

(for Nordic model)

■ SPECIFICATIONS

Power Source:	From telephone line
Dial Mode:	Tone (DTMF) /Pulse
Redial:	Last dialed telephone number
Speaker:	Handset; 3 cm (13/16") PM dynamic type receiver unit, 150 Ω
Microphone:	Electret condenser microphone
Dimensions (H x W x D):	Approx. 96mm x 150mm x 200mm
Weight:	Approx. 475g
Operating Environment:	5°C - 40°C

Specifications are subject to change without notice.

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF. Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.

When this mark does appear please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

Panasonic

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 **WARNING**

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.

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1 ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:

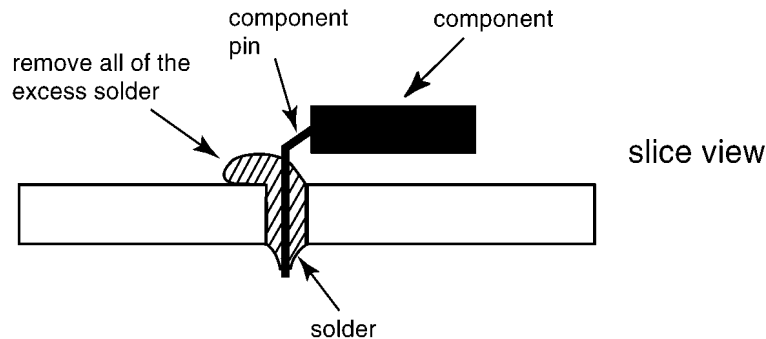
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

We will use PbF Solder when discussing the lead free solder used in our manufacturing process which is made from Tin (Sn), Silver (Ag), and Copper (Cu).

This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder although, with some precautions, standard Pb solder can also be used.

Caution

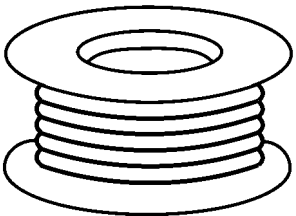
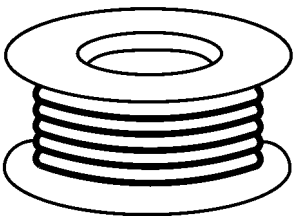
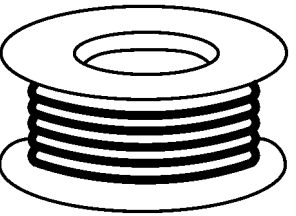
- PbF solder has a melting point that is 50°F ~70°F (30°C ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700°F ± 20°F (370°C ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.
- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F (600°C).
- If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.
- When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See the figure below).



1.1. Suggested PbF Solder

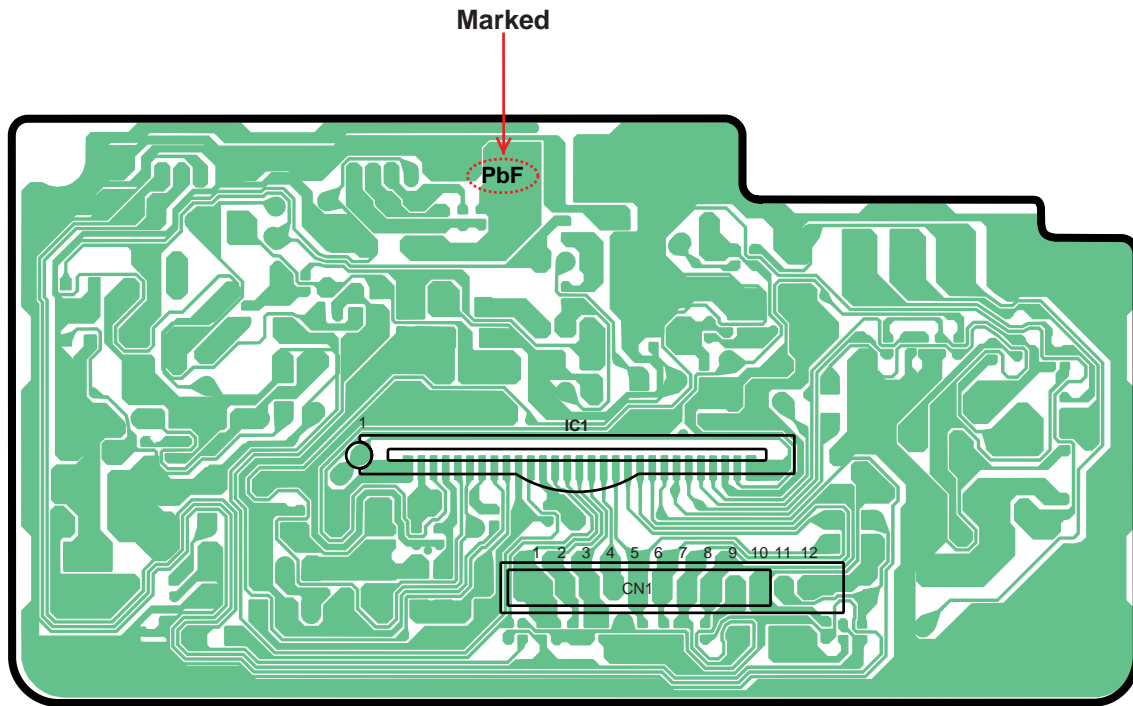
There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper (Sn+Ag+Cu), you can also use Tin and Copper (Sn+Cu) or Tin, Zinc, and Bismuth (Sn+Zn+Bi). Please check the manufacturer's specific instructions for the melting points of their products and any precautions for using their product with other materials.

The following lead free (PbF) solder wire sizes are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.

0.3mm X 100g	0.6mm X 100g	1.0mm X 100g
		

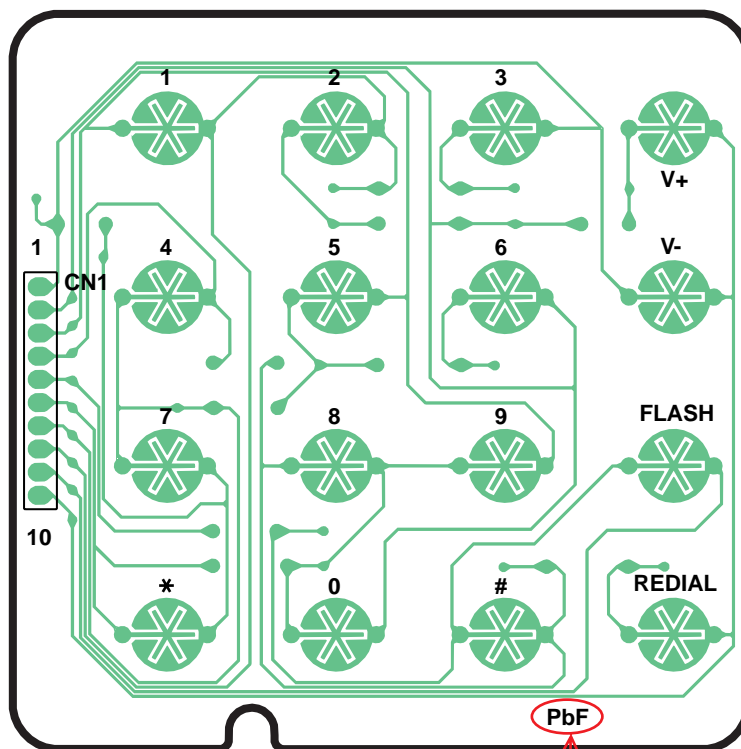
1.2. How to recognize that Pb Free solder is used

1.2.1. Main PCB



(Component View)

1.2.2. Operational PCB



(Flow Solder Side View)

Note:

The location of the "PbF" marks is subject to change without notice.

2 FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help prevent recurring malfunctions.

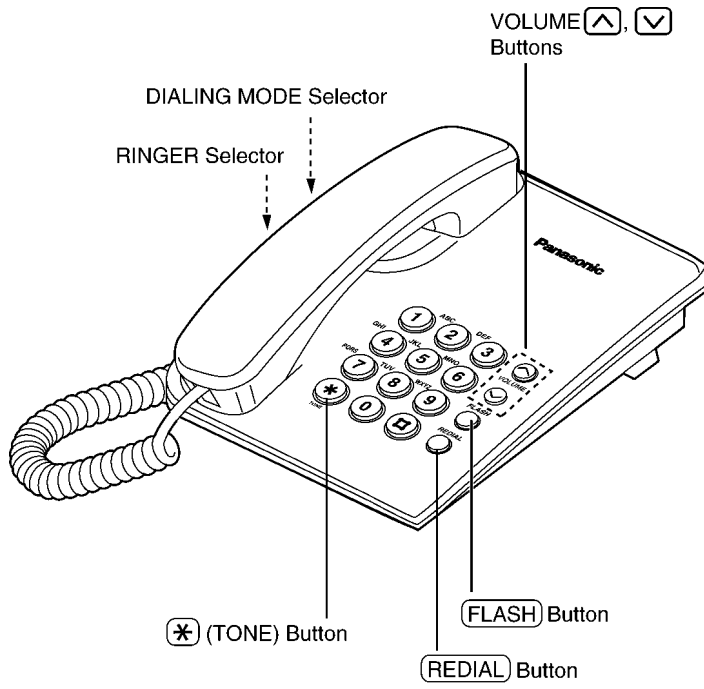
1. Cover the plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the worktable.
4. Do not touch IC or LSI pins with bare fingers.

3 CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacture's Instructions.

4 LOCATION OF CONTROLS

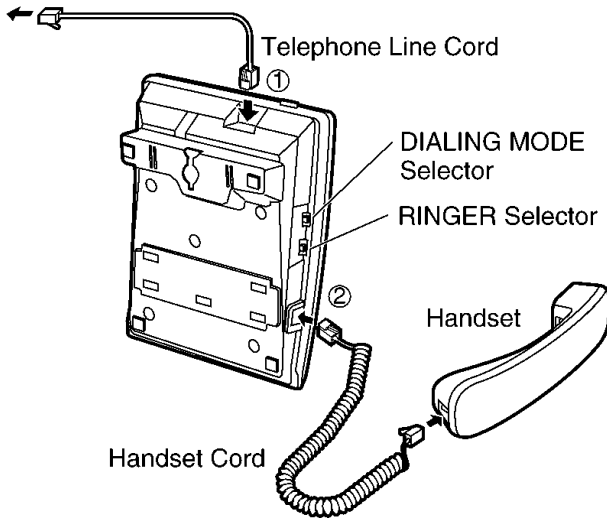


5 SETTINGS

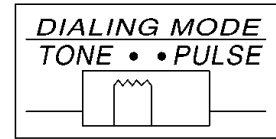
5.1. Connection

- 1 Connect the handset cord (①).
- 2 Connect the handset cord (②), then confirm the dial tone.

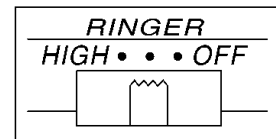
To Single-Line Telephone Jack



- 3 Set the DIALING MODE selector to TONE.
 - If you cannot dial, set to PULSE.



- 4 Set the RINGER selector to HIGH, LOW or OFF. (Ex. "LOW" is selected.)



- When set to OFF, the unit will not ring.

6 OPERATIONS

6.1. Making Calls

- 1 Lift the handset.
- 2 Dial a phone number.
 - If you misdial, hang up and start again from step 1.
- 3 When finished talking, hang up.

To redial the last number dialed

- 1 Lift the handset.
- 2 Press **REDIAL**.

To adjust the receiver volume (6 levels) while talking

To increase, press **▲**.

To decrease, press **▼**.

- After hanging up, the volume level will be saved.

6.2. Answering Calls

- 1 When the unit rings, lift the handset.
- 2 When finished talking, hang up.

7 SPECIAL FEATURES

7.1. For Call Waiting Service Users

Press **FLASH** if you hear a call-waiting tone while talking.

- The first call is put on hold and you can answer the second call.
- To return to the first caller, press **FLASH** again.

7.2. Temporary Tone Dialing (For Rotary or Pulse Service Users)

Press *** (TONE)** before entering access numbers which require tone dialing.

- The dialing mode changes to tone.
You can enter numbers to access answering services, electronic banking services, etc.
When you hang up, the mode will return to pulse.
- Access numbers entered after pressing *** (TONE)** will not be included when redialing.

8 DISASSEMBLY INSTRUCTIONS

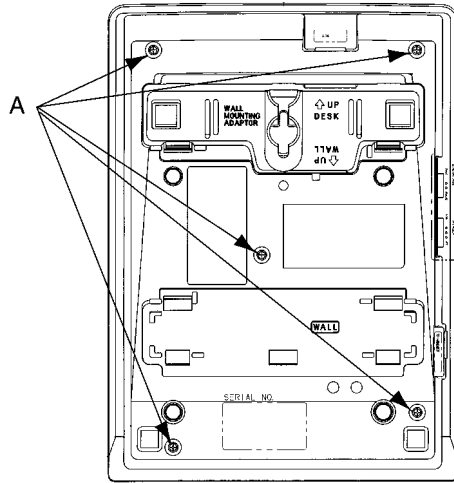
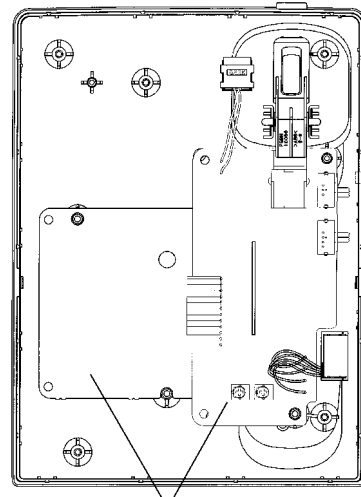


Fig. 1



Remove the P.C. Boards
Fig. 2

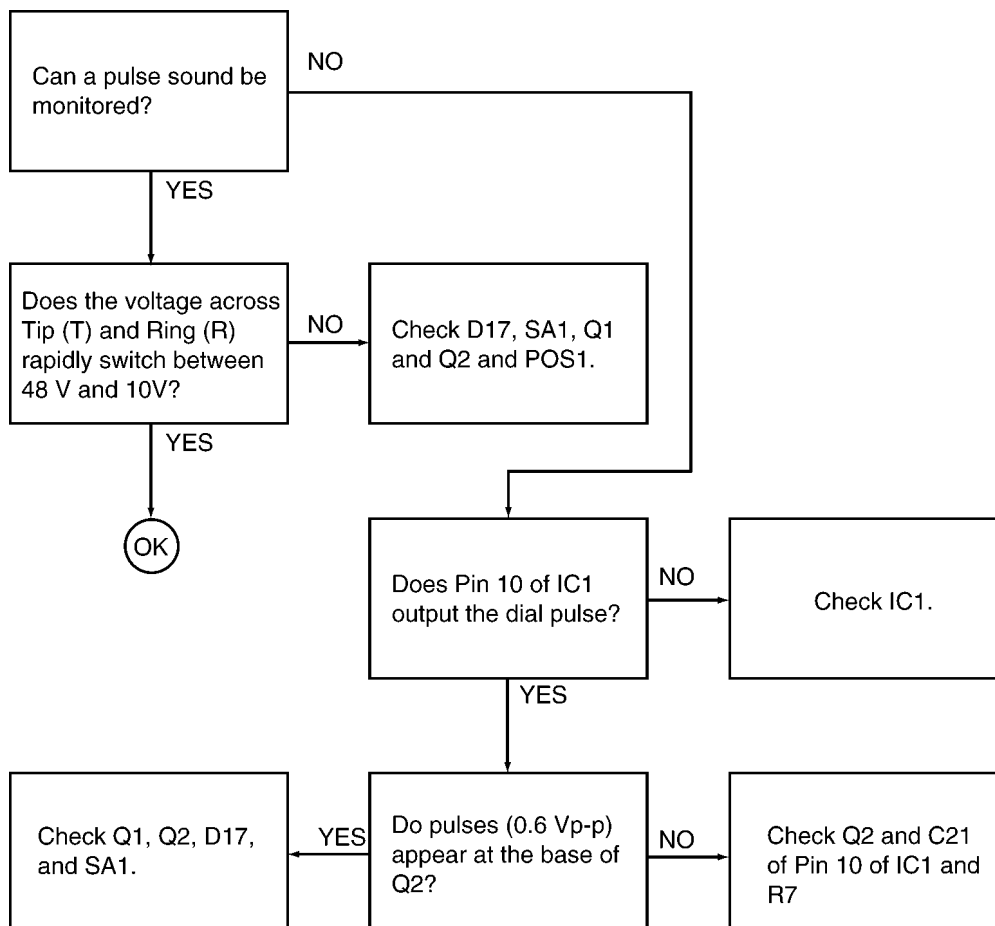
Shown in Fig —.	To remove —.	Remove —.
1	Lower Cabinet	Screws (2.6 × 10) (A) × 5
2	P.C. Boards	Remove the P.C.Boards

9 TROUBLE SHOOTING GUIDE

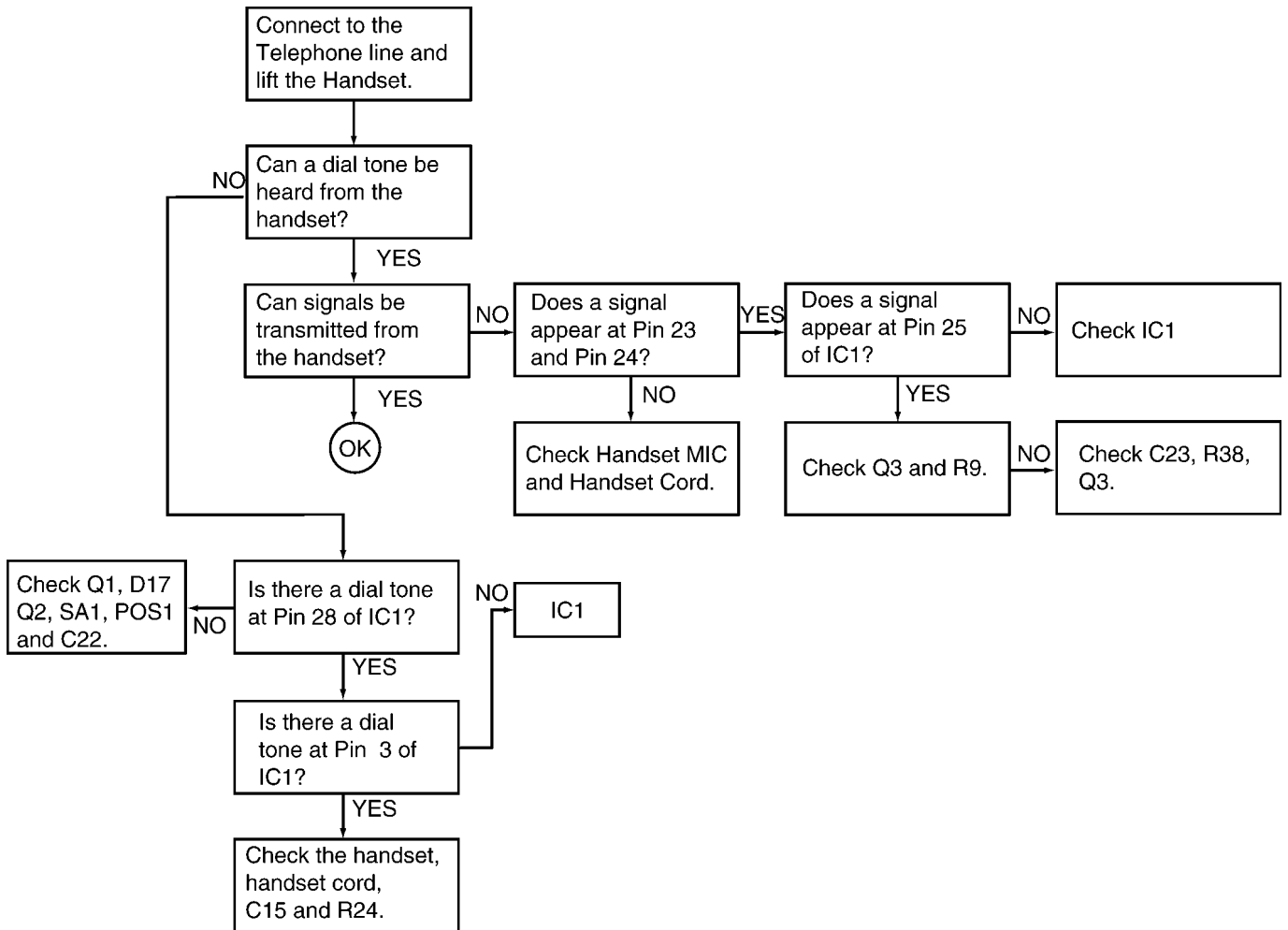
9.1. Service Hints

SYMPTOM	CURE
No Tone Dialing	Check IC1, Q2, Q1, C22 and R24.
Dead	Check IC1, Q2, Q1 and D17.
Rings, no dial tone, no pulse or tone dial	Check Q1, Q2, D17, Q3 and IC1.
No rings	Check C1, R2, D4 and IC1.
No volume Handset	Check IC1, R24, C15 and C22.
Buttons stick under upper cabinet assembly. From key board	Adjust the setting of buttons.
No pulse dial	Check Q1, Q2 and IC1.

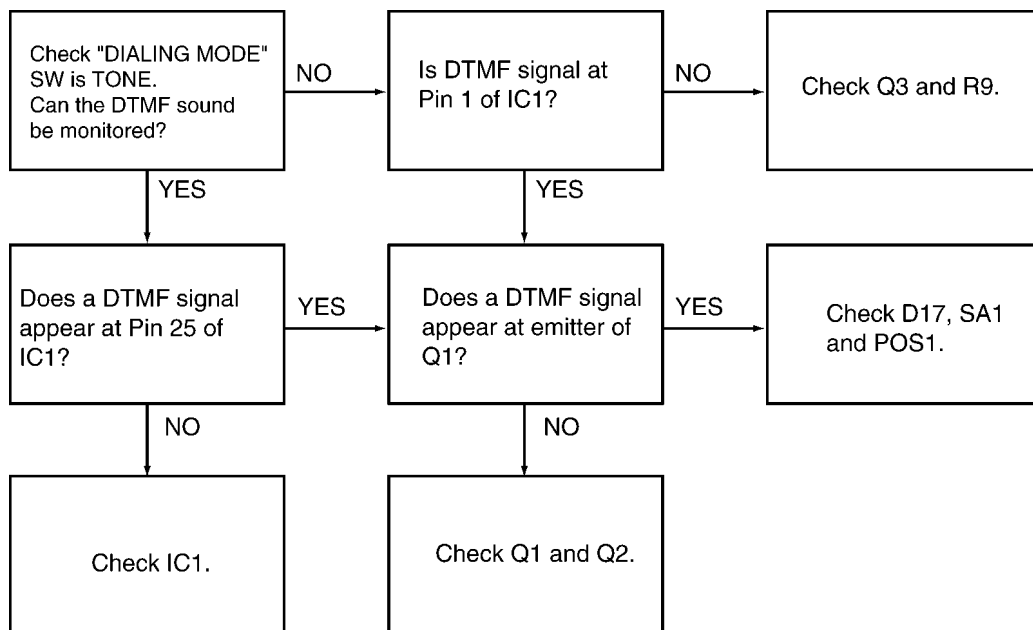
9.2. Pulse Dialing Problems



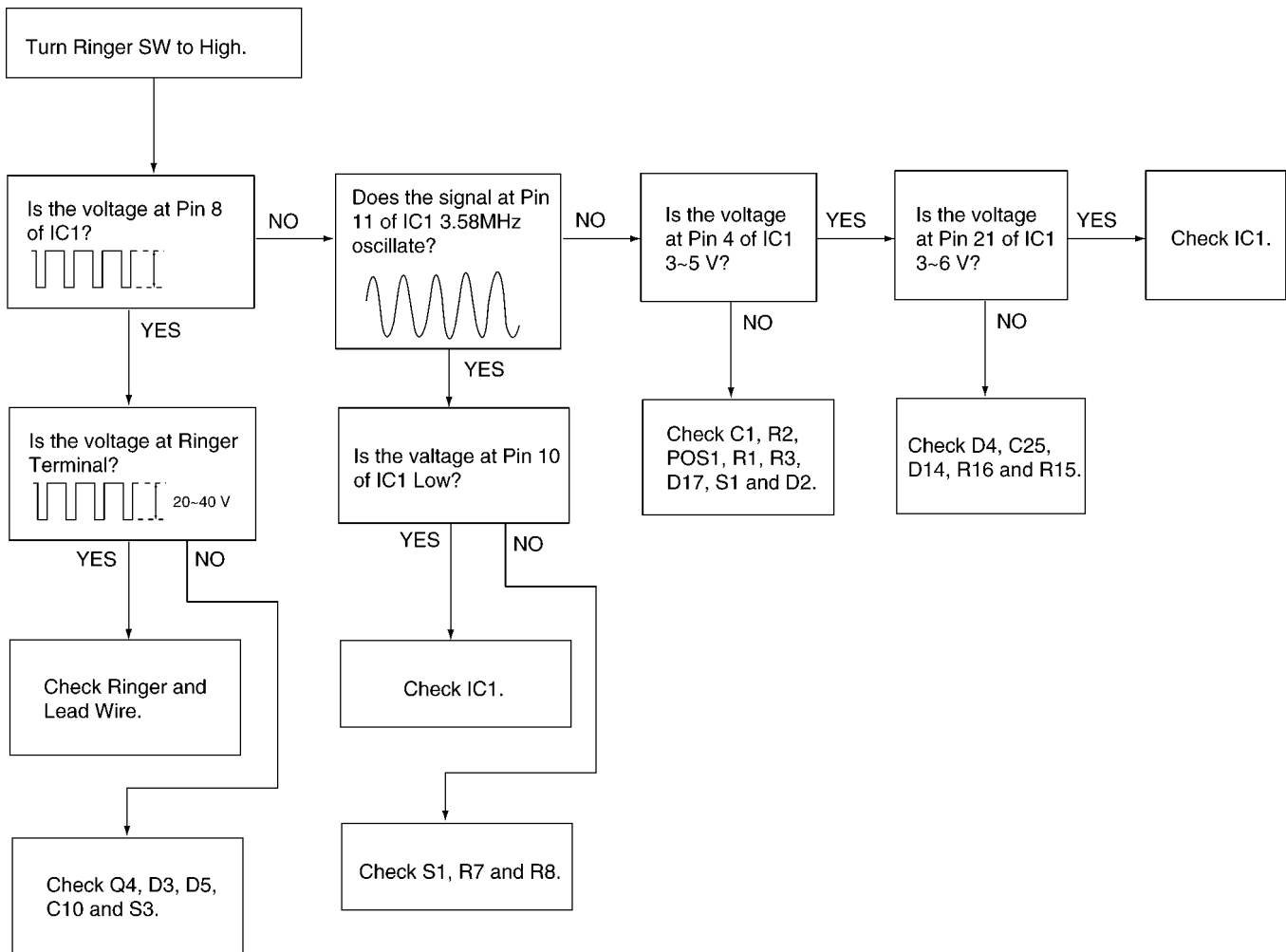
9.3. Problems With the Handset



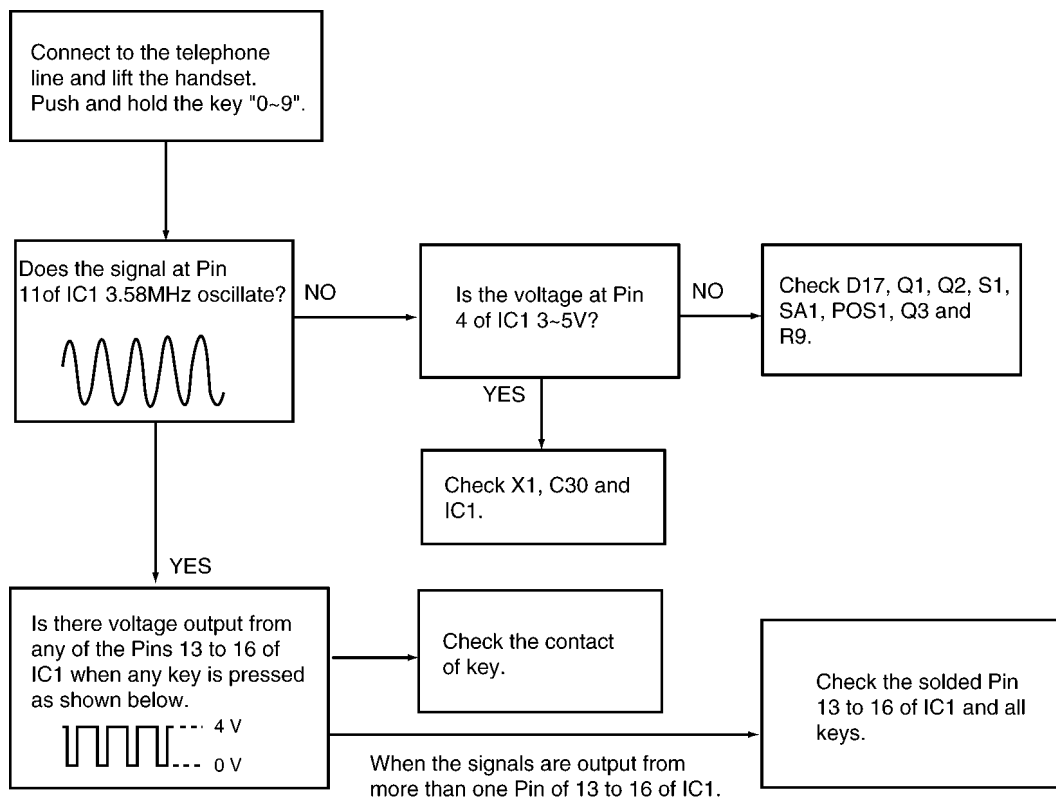
9.4. Tone Dialing Problems



9.5. Problems With Ringer



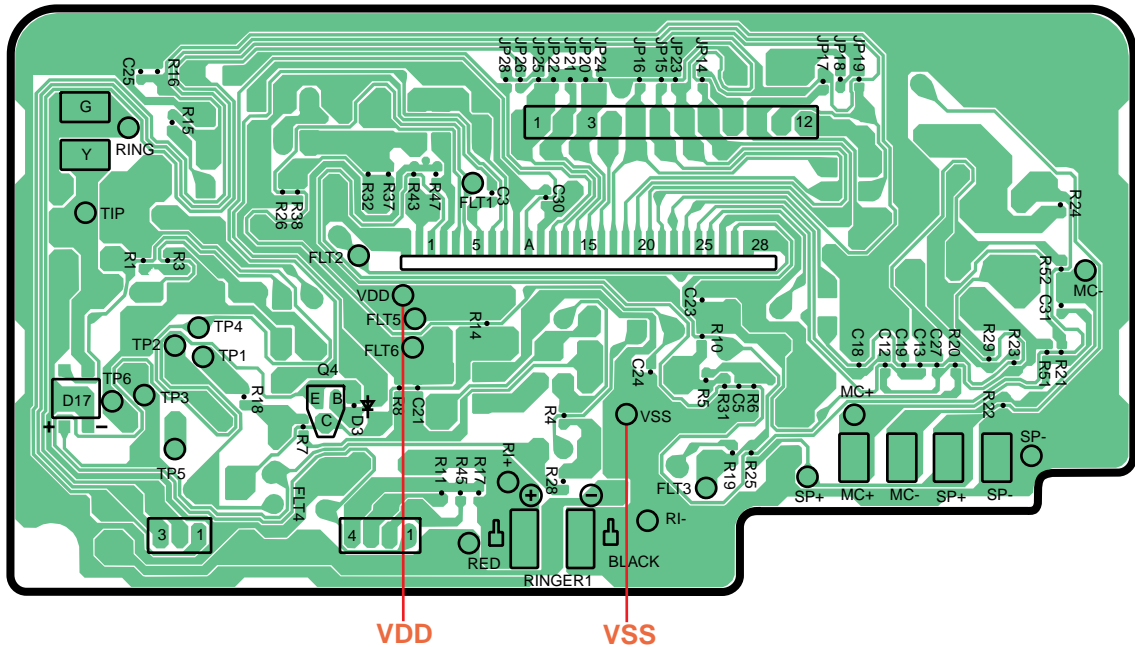
9.6. How to Check the IC1 (Scanning to the key)



9.7. Bell Ringing Problem and Volume Level Problem

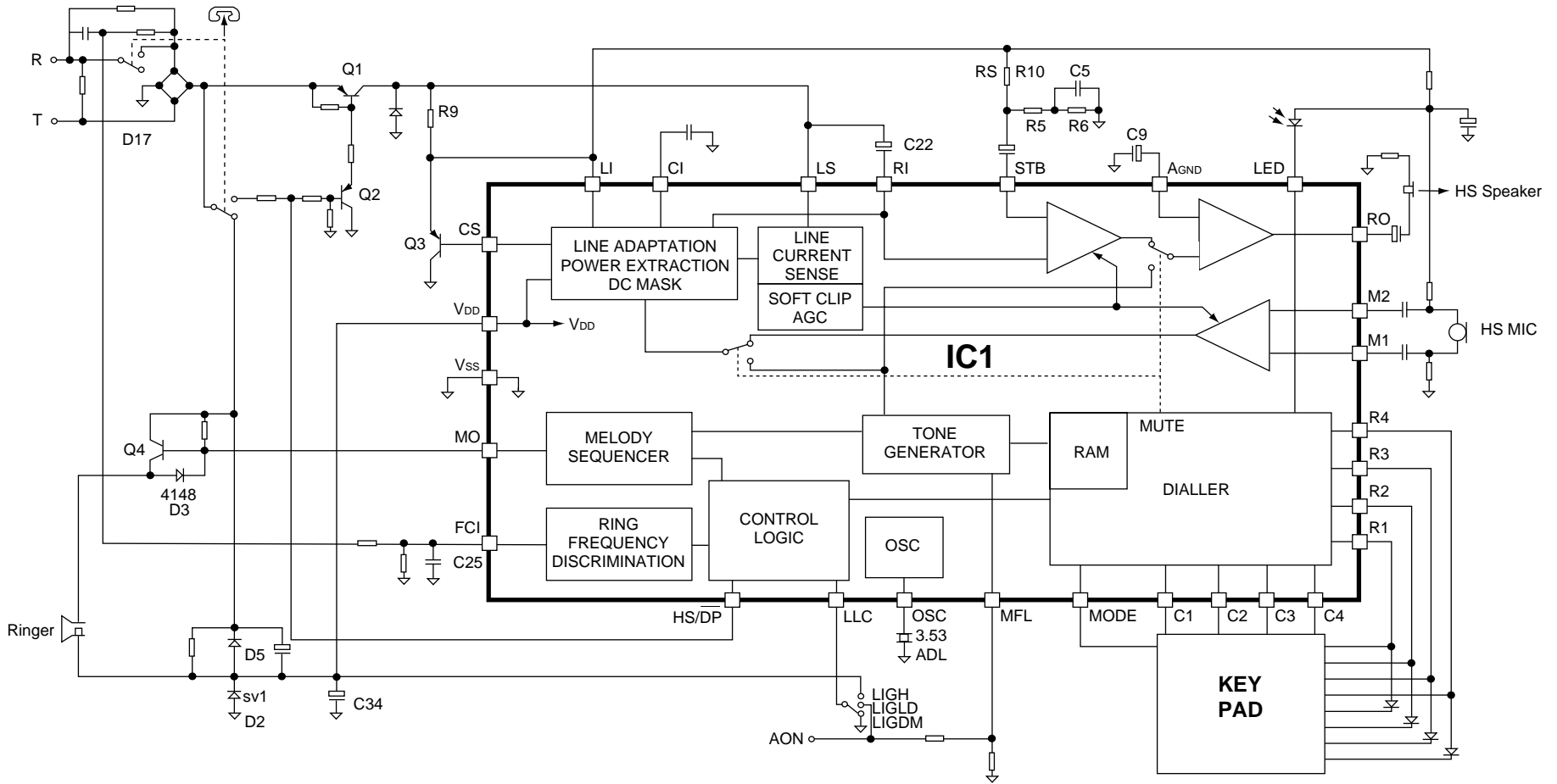
When Ringer Pattern or Volume Level are not the default setting, please follow steps 1 to 5.

1. Remove the telephone line from the unit.
2. Short VDD and VSS with lead wire. (See Fig.1)
3. Plug into the telephone line.
4. Lift the handset off the unit, and confirm to hear the tone dialing. Then hang up the handset on the unit (ON-HOOK).
5. Send the Bell signal to the unit (Making a call), and confirm it normal call.



<Fig.1>

10 BLOCK DIAGRAM



KX-TS500FXB/FXC/FXH/FXR/FXW BLOCK DIAGRAM

11 OPTION JUMPER TABLE

Dialing Mode SW

	Function	Option	
PULSE	10pps 33/66ms	JP14	
	10pps 40/60ms	JP23	default
	20pps 33/66ms	JP15	
	20pps 40/60ms	JP16	
TONE	MF 82/82ms	JP18	
	MF 82/160ms	JP19	default

Flash Key

Flash time	Option	
100 ms	JP20	default
270 ms	JP21	
600 ms	JP22	

Note:

Refer to **Main (Flow Solder Side View)** (P.32)

12 CIRCUIT OPERATIONS

12.1. Telephone Line Interface and Pulse Dial Circuit

When the hook switch SW1 is ON (off-hook), the circuit is closed, and current is supplied to the base of Q2 via the diode bridge D17 and Q2 is On → Q1 is ON (OFF-HOOK condition).

Q1 and Q2 are the dial pulse generating circuits, and are driven by the DIALER (IC1), when the DIALER Pin 10 of IC1 is LOW → Q2 is OFF and Q1 is OFF (break). If port Pin 10 is HIGH → Q2 is ON → Q1 is ON (make).

12.2. Tone Dial Circuit

Function:

The tone dialing circuit consists of a DTMF (Dual Tone Multi Frequency) signal generator (outputted from Pin 25 of the IC1) for tone dialing, and also a circuit for outputting the signal to line.

The DTMF circuit identifies inputs from the 12 keys (1,2,3,4,5,6,7,8,9,0, * and #) by means of a total of seven frequencies, that is four low frequencies (Low group) and three high frequencies (High group).

Circuit Description:

When a dial key is pressed, a DTMF signal is output from Pin 25 of IC1 as an analog synthetic wave.

The signal flow to the line is as follows.

Pin 25 of IC1 → Q3 → R9 → Q1 → Tel Line.

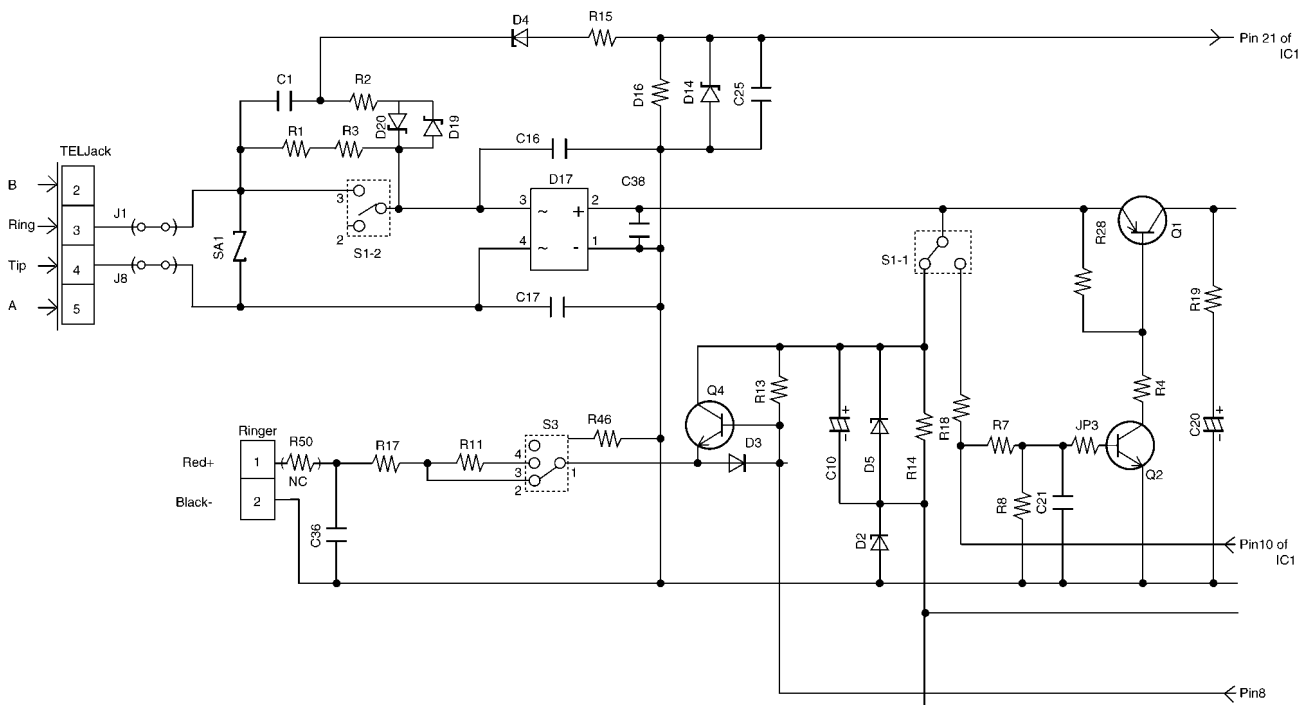
The DTMF signal is sent to the line via the following path. Q3 is an amplifier which is used to output the signal to line.

Shown below is the signal flow used to output the DTMF signal from the handset as a monitor tone when a dial key is pressed.

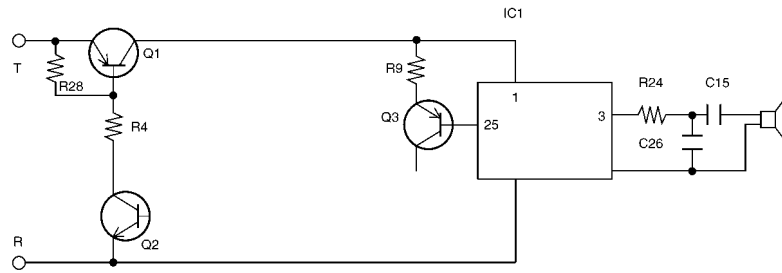
Pin 3 of IC1 → R24 → C15 → Handset Speaker.

The signal combination and frequency corresponding to each dial key is shown on next page.

Circuit Diagram



Circuit Diagram



Tone Frequencies

Low Group \ High Group	High Group		
	H1	H2	H3
L1	1	2	3
L2	4	5	6
L3	7	8	9
L4	*	0	#

Low Group	Frequencies	High Group	Frequencies
L1	697 Hz } 1.5%	H1	1209 Hz } 1.5%
L2	770 Hz } 1.5%	H2	1336 Hz } 1.5%
L3	852 Hz } 1.5%	H3	1477 Hz } 1.5%
L4	941 Hz } 1.5%		

12.3. Ringer Circuit

Circuit Operation:

The bell signal passes through C1 (R1) → pin 21 of IC1 detect the bell signal.

The ring signal is output from Pin 8 of IC1, and its volume is adjusted in 3 steps (H-L-OFF) by SW3 then impressed on the ceramic sound generator, and so is generated.

R15, R16 Bell sensitivity adjustment

Below content (inside ruled line) is information only for service correspondence.

Usually, the default setting is digit 6.

<p>Tone Ringer (Melody/Volume) The three basic frequencies of the melodies are:</p> <p>F1 ... 800 Hz, F2 ... 1067 Hz, and F3 ... 1333 Hz (±5%).</p> <p>The repetition rate and the volume of the tone ringer melodies can be programmed by shorting pin 16 and pin 20 of IC1 and pressing # followed by a digit as follows:</p> <p style="text-align: center;">OR</p> <p>Repetition rate means that a sequence of 6 frequencies is repeated 1, 4 or 10 times within 1 second.</p> <table border="0"> <thead> <tr> <th>Digit</th> <th>Repetition Rate</th> <th>Volume</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1 time (50 ms pause)</td> <td>-16 dB</td> </tr> <tr> <td>2</td> <td>1 time (50 ms pause)</td> <td>-7 dB</td> </tr> <tr> <td>3</td> <td>1 time (50 ms pause)</td> <td>0 dB (max.)</td> </tr> <tr> <td>4</td> <td>4 times</td> <td>-16 dB</td> </tr> <tr> <td>5</td> <td>4 times</td> <td>-7 dB</td> </tr> <tr> <td>6</td> <td>4 times (default)</td> <td>0 dB (max.)</td> </tr> <tr> <td>7</td> <td>10 times</td> <td>-16 dB</td> </tr> <tr> <td>8</td> <td>10 times</td> <td>-7 dB</td> </tr> <tr> <td>9</td> <td>10 times</td> <td>0 dB (max.)</td> </tr> <tr> <td>0</td> <td>None</td> <td>Off</td> </tr> </tbody> </table>	Digit	Repetition Rate	Volume	1	1 time (50 ms pause)	-16 dB	2	1 time (50 ms pause)	-7 dB	3	1 time (50 ms pause)	0 dB (max.)	4	4 times	-16 dB	5	4 times	-7 dB	6	4 times (default)	0 dB (max.)	7	10 times	-16 dB	8	10 times	-7 dB	9	10 times	0 dB (max.)	0	None	Off	<p>The procedure is ended by shorting pin 16 and pin 20 of IC1.</p> <p>The default setting is digit 6, i.e. after a power on reset the device will start up with repetition rate 4 and maximum volume. If digit 0 is programmed, the tone ringer will be turned off until next off-hook, where it will turn back to the last setting before 0. The programmed settings are stored in the on chip RAM.</p> <p>The sequence of the frequencies is controlled by the sequence register as follows:</p> <p style="text-align: center;">Sequence F1 F2 F3 F1 F2 F3 ...</p>
Digit	Repetition Rate	Volume																																
1	1 time (50 ms pause)	-16 dB																																
2	1 time (50 ms pause)	-7 dB																																
3	1 time (50 ms pause)	0 dB (max.)																																
4	4 times	-16 dB																																
5	4 times	-7 dB																																
6	4 times (default)	0 dB (max.)																																
7	10 times	-16 dB																																
8	10 times	-7 dB																																
9	10 times	0 dB (max.)																																
0	None	Off																																

12.4. Power Circuit and Redial Back-up Circuit

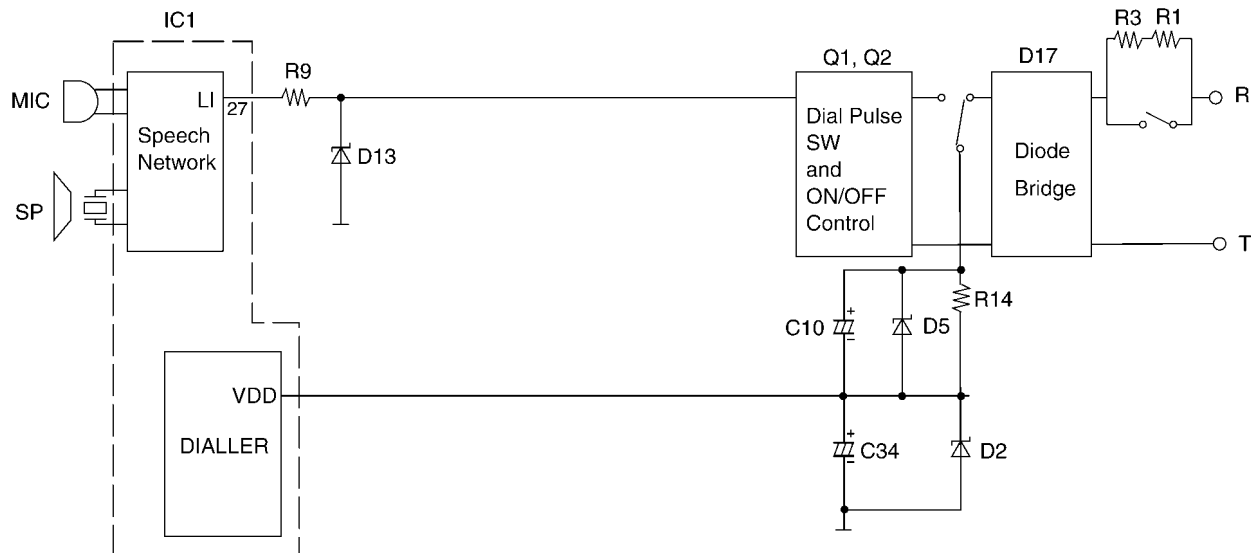
Function:

This set is powered from the line. When it is an OFF-HOOK status, Tel Line → D17 → Q1 → R9 → Pin 27 of IC1 (to become the power supply for IC1 speech network).

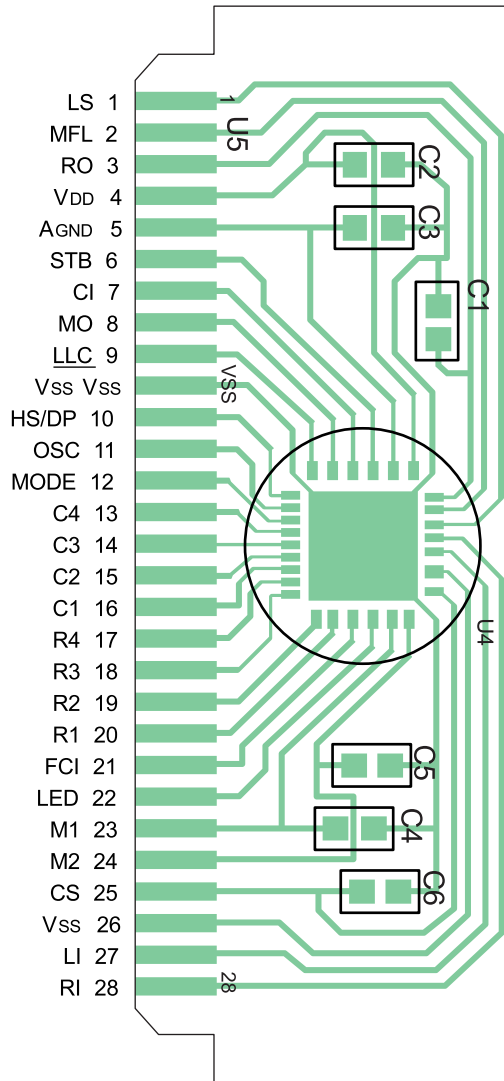
The voltage from the line is turned into a constant voltage by D2 and then supplied to the IC1, reset circuit.

Through Tel Line → R1 → R3 → D17 → R14 to become the power supply for IC1, and the redial Back-up will be done.

Block Diagram



13 CPU DATA

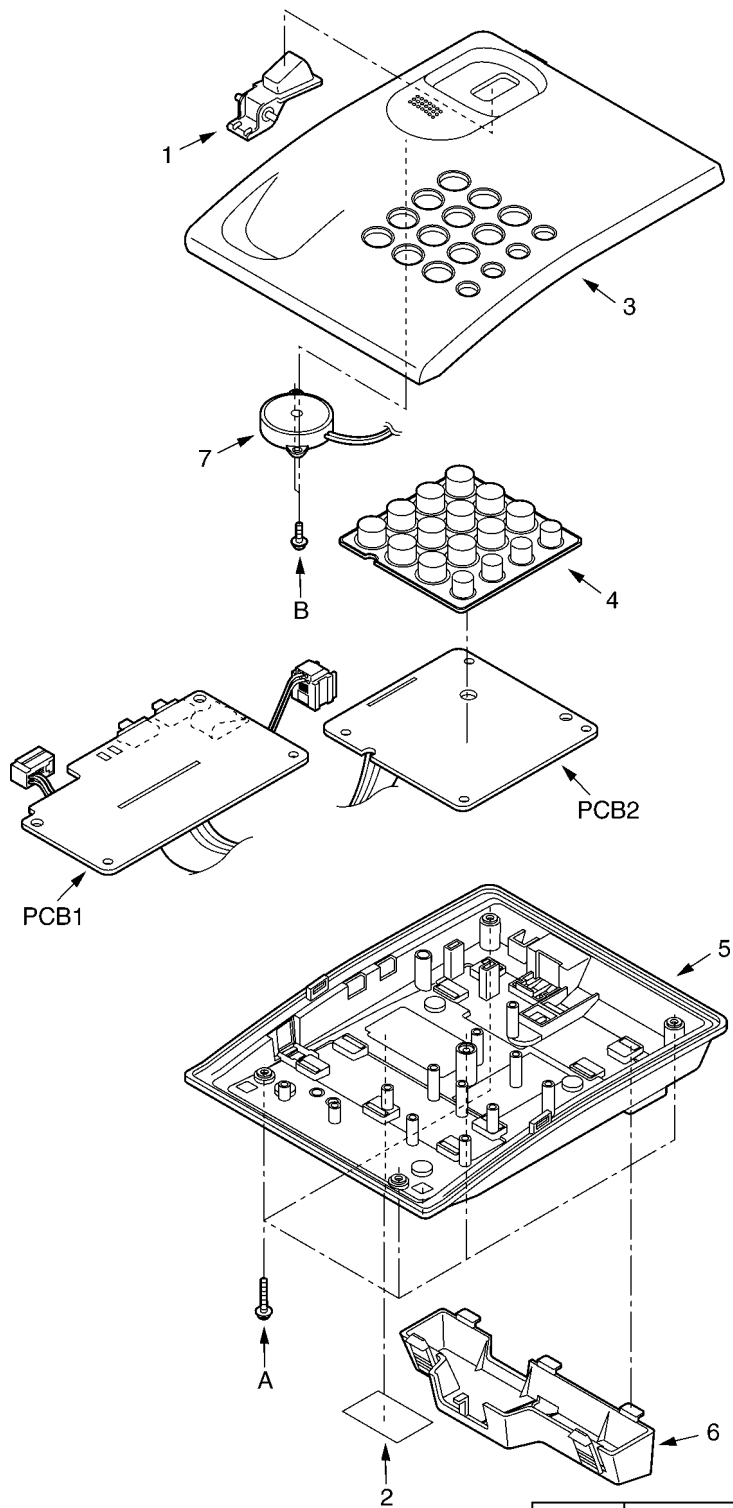


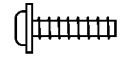

IC1: N5BCBZ000001
 Clock frequency: 3.58MHz
 Operating range: 13~100mA

Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	LS	Line Current Sense Input	15	C2	Keyboard Column
2	MFL	MF Level Setting	16	C1	Keyboard Column
3	RO	Receive Output	17	R4	Keyboard Row
4	V _{DD}	Positive Voltage Supply	18	R3	Keyboard Row
5	A _{GND}	Analogue Ground	19	R2	Keyboard Row
6	STB	Side Tone Balance Input	20	R1	Keyboard Row
7	CI	Complex Impedance Pin	21	FCI	Frequency Comparator Input
8	MO	Melody Output	22	LED	LED Output Driver
9	LLC	Line Loss Compensation	23	M1	Microphone Input
10	HS/DP	Hook Switch Input and Dial Pulse Output	24	M2	Microphone Input
11	OSC	Oscillator Input	25	CS	Current Shunt Control Output
12	MODE	Signalling Mode Select Input	26	V _{SS}	Negative Power Supply
13	C4	Keyboard Column	27	LI	Line Input
14	C3	Keyboard Column	28	RI	Receive Input
			V _{SS}	V _{SS}	EMC ground connection

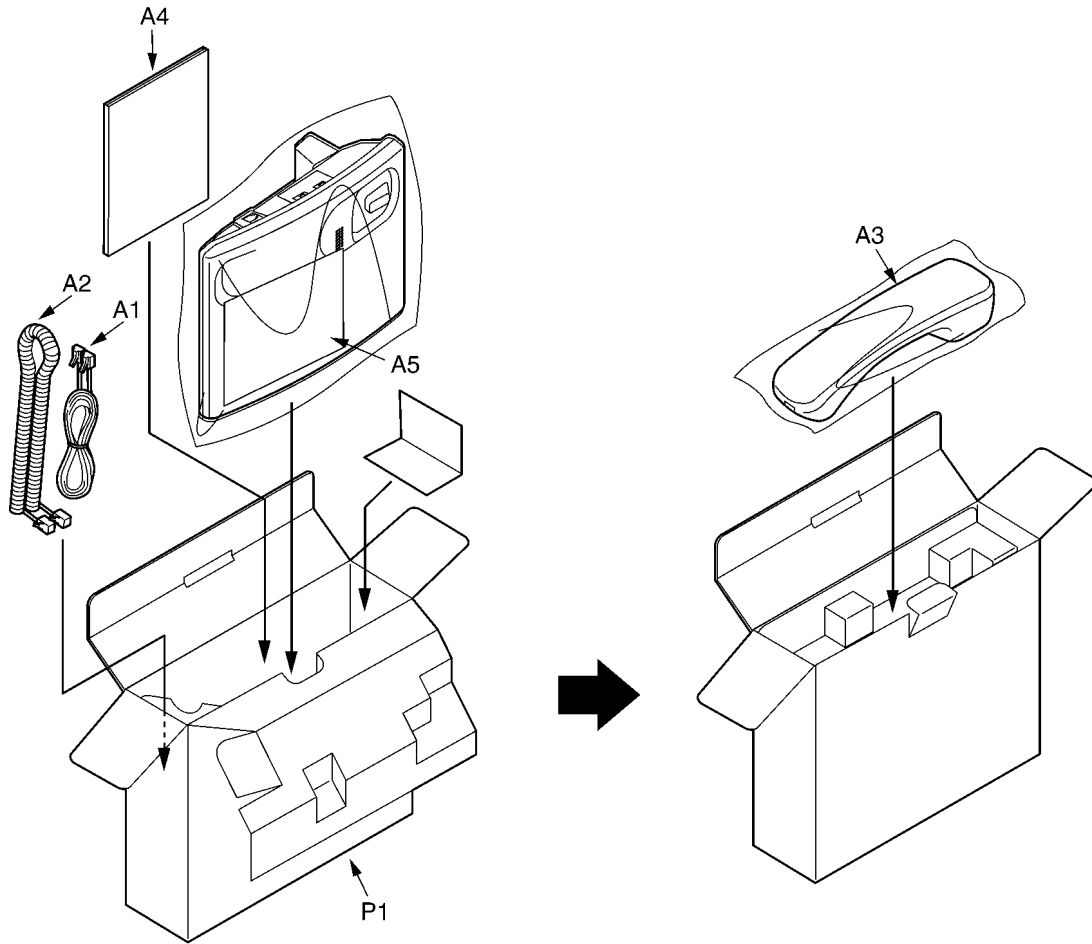
Pin No.	Description						
1	This is the input for sending the line current.						
2	A voltage divider connected from this pin to A GND and VSS can be used to set the DTMF level.						
3	This is the output for driving a dynamic earpiece with an impedance of 140 to 300 Ω .						
4	This is the supply pin for the circuit.						
5	This is the analog(ue) ground for the amplifiers.						
6	This is the input for side tone cancellation.						
7	For complex impedance a capacitor should be connected to this pin.						
8	PDM output of the melody generator for tone ringing. Hi-Z when not active.						
9	Select pin for line loss compensation. LLC = AGND: 20-50 mA LLC = VDD: 45-75 mA LLC = VSS: none.						
10	This is an I/O that is pulled high by the hook switch when off-hook and an open drain pulls it low during break periods of pulse dialing and flash.						
11	Pin for ceramic resonator (3.58 MHz).						
12	<table border="1"> <thead> <tr> <th>Mode pin</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Row 2</td> <td>mode, 10 pps, 40/60 ms</td> </tr> <tr> <td>Row 6</td> <td>MF only, 82/82 ms</td> </tr> </tbody> </table> <p>During temporary MF : 82/160 ms</p>	Mode pin	Function	Row 2	mode, 10 pps, 40/60 ms	Row 6	MF only, 82/82 ms
Mode pin	Function						
Row 2	mode, 10 pps, 40/60 ms						
Row 6	MF only, 82/82 ms						
13~16	(see key arrangement in Schematic Diagram) the scanning to the key.						
17~20	(see key arrangement in Schematic Diagram) the scanning to the key.						
21	This is a Schmitt trigger input for ring frequency discrimination. Disabled during off-hook.						
22	Output for driving an LED that will be flashing when in Programme.						
23,24	Differential inputs for the microphone (electric).						
25	This N-channel open drain output controls the external high power shunt transistor for the modulation of the line voltage and for shorting the line during make period of pulse dialing.						
27	This input is used for power extraction and line current sending.						
28	This is the input for the receive signal.						

14 CABINET AND ELECTRICAL PARTS LOCATION

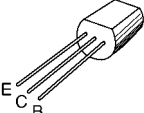
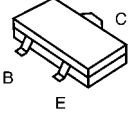
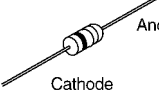
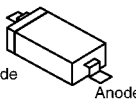
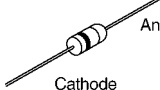
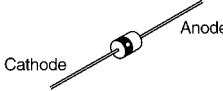
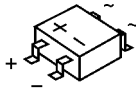


A	XTW26+10P	 φ 2.6 × 10mm
B	XTW26+8P	 φ 2.6 × 8mm

15 ACCESSORY AND PACKING MATERIALS



16 TERMINAL GUIDE OF ICs TRANSISTORS AND DIODES

 <p>2SA1625 PQVT2N6517CA PQVTKSB564AC</p>	 <p>2SD1819A</p>	 <p>MA4051</p>	 <p>MA111</p>	 <p>MA4200 MA4300 MA4100</p>
 <p>1SS119</p>	 <p>PQVDS1ZB60F1</p>			

17 REPLACEMENT PARTS LIST

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 dependant 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 Δ mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.

3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.

4. ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.

5. RESISTORS & CAPACITORS

Unless otherwise specified;

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

All capacitors are in MICRO FARADS (μ F)P= μ mF

*Type & Wattage of Resistor

Type

ERC:Solid ERDS:Carbon ERJ:Chip	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Chip ERS:Fusible Resistor 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 ECQS:Styrol ECUV,PQCUV,ECUE:Chip ECQMS:Mica	ECCD,ECKD,ECBT,F1K,ECUV: Ceramic ECQE,ECQV,ECQG: Polyester ECEA,ECST,EEE: Electrolytic ECQP: Polypropylene
--	---

Voltage

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

17.1. Base Unit

17.1.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQBH10033Z2	PUSH BUTTON, HOOK (for KX-TS500FXB)	ABS-HB
1	PQBH10033Z8	PUSH BUTTON, HOOK (for KX-TS500FXC)	ABS-HB
1	PQBH10033Z9	PUSH BUTTON, HOOK (for KX-TS500FXH)	ABS-HB
1	PQBH10033Z3	PUSH BUTTON, HOOK (for KX-TS500FXR)	ABS-HB
1	PQBH10033Z1	PUSH BUTTON, HOOK (for KX-TS500FXW)	ABS-HB
2	PQGT16426Z	NAME PLATE (for KX-TS500FXB)	

Ref. No.	Part No.	Part Name & Description	Remarks
2	PQGT16553Z	NAME PLATE (for KX-TS500FXC)	
2	PQGT16554Z	NAME PLATE (for KX-TS500FXH)	
2	PQGT16427Z	NAME PLATE (for KX-TS500FXR)	
2	PQGT16425Z	NAME PLATE (for KX-TS500FXW)	
3	PQKM10610Z2	CABINET BODY (for KX-TS500FXB)	PS-HB
3	PQKM10610Z4	CABINET BODY (for KX-TS500FXC)	PS-HB
3	PQKM10610Z5	CABINET BODY (for KX-TS500FXH)	PS-HB
3	PQKM10610Z3	CABINET BODY (for KX-TS500FXR)	PS-HB
3	PQKM10610Z1	CABINET BODY (for KX-TS500FXW)	PS-HB
4	PQSX10248Y	KEYBOARD SWITCH, 16KEY (for KX-TS500FXB) (for KX-TS500FXC) (for KX-TS500FXR)	
4	PQSX10248X	KEYBOARD SWITCH, 16KEY (for KX-TS500FXH)	
4	PQSX10248Z	KEYBOARD SWITCH, 16KEY (for KX-TS500FXW)	
5	PQYF10573X2	CABINET COVER (for KX-TS500FXB)	PS-HB
5	PQYF10573X4	CABINET COVER (for KX-TS500FXC)	PS-HB
5	PQYF10573X5	CABINET COVER (for KX-TS500FXH)	PS-HB
5	PQYF10573X3	CABINET COVER (for KX-TS500FXR)	PS-HB
5	PQYF10573X1	CABINET COVER (for KX-TS500FXW)	PS-HB
6	PQYL10013Z2	STAND, WALL MOUNT (for KX-TS500FXB)	PS-HB
6	PQYL10013Z4	STAND, WALL MOUNT (for KX-TS500FXC)	PS-HB
6	PQYL10013Z5	STAND, WALL MOUNT (for KX-TS500FXH)	PS-HB
6	PQYL10013Z3	STAND, WALL MOUNT (for KX-TS500FXR)	PS-HB
6	PQYL10013Z1	STAND, WALL MOUNT (for KX-TS500FXW)	PS-HB
7	L0DDFD000002	BUZZER	

17.1.2. Main P.C.Board Parts

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWP1TS500FX	MAIN P.C.BOARD ASS'Y (RTL) (IC)	
IC1	N5BCBZ000001	IC (TRANSISTORS)	
Q1	2SA1625	TRANSISTOR(SI)	S
Q2	PQVT2N6517CA	TRANSISTOR(SI)	S
Q3	PQVTKSB564AC	TRANSISTOR(SI)	S
Q4	2SD1819A	TRANSISTOR(SI)	
		(DIODES)	
D2	MA4051	DIODE(SI)	S
D3	MA111	DIODE(SI)	S
D4	MA4200	DIODE(SI)	S
D5	MA4300	DIODE(SI)	S
D8	1SS119	DIODE(SI)	S
D9	1SS119	DIODE(SI)	S
D13	MA4100	DIODE(SI)	S
D14	MA4051	DIODE(SI)	S
D17	PQVDS1ZB60F1	DIODE(SI)	S
D19	1SS119	DIODE(SI)	S
D20	1SS119	DIODE(SI)	S
		(JACKS)	
JACK1	PQJJ1T029Z	JACK, MODULAR	
JACK3	PQJJ1T030Z	JACK, HANDSET (SWITCHES)	
S1	PQSH2B105Z	SWITCH, HOOK	S
S2	PQSS2A27W	SLIDE SWITCH	
S3	PQSS3A17W	SLIDE SWITCH (VARIABLE RESISTORS)	
VR1	PQNVZ6TLTB13	VARIABLE RESISTOR	S
VR2	EVNDXAA03B24	VARIABLE RESISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
		(RESISTORS)	
R1	ERJ3GEYJ335	3.3M	
R2	ERDS1VJ682	6.8K	
R3	ERJ3GEYJ185	1.8M	
R4	ERJ3GEYJ392	3.9K	
R5	ERJ3GEYJ332	3.3K	
R6	ERJ3GEYJ822	8.2K	
R7	ERJ3GEYJ823	82K	
R8	ERJ3GEYJ334	330K	
R9	ERDS1TJ330	33	s
R10	ERJ3GEYJ331	330	
R11	ERJ3GEYJ103	10K	
R13	ERDS2TJ104	100K	
R14	ERJ3GEYJ334	330K	
R15	ERJ3GEYJ334	330K	
R16	ERJ3GEYJ224	220K	
R17	ERJ3GEYJ470	47	
R18	ERJ3GEYJ104	100K	
R20	ERJ3GEYJ222	2.2K	
R21	ERJ3GEYJ182	1.8K	
R22	ERJ3GEYJ182	1.8K	
R25	ERJ3GEYJ104	100K	
R26	ERJ3GEYJ683	68K	
R28	ERJ3GEYJ473	47K	
R29	ERJ3GEYJ331	330	
R31	ERJ3GEYJ153	15K	
R32	ERJ3GEYJ333	33K	
R46	ERDS2TJ470	47	
R47	ERJ3GEY0R00	0	
R51	ERJ3GEYJ221	220	
R52	ERJ3GEYJ221	220	
JP18	ERJ3GEY0R00	0	
JP20	ERJ3GEY0R00	0	
JP23	ERJ3GEY0R00	0	
		(CAPACITORS)	
C1	F0C2E105A037	1	
C3	ECUV1H123KBV	0.012	
C5	ECUV1H103KBV	0.01	
C6	ECEA1HKA010	1	
C9	ECEA0JKS220	22	s
C10	ECEA1HKS100	10	s
C11	ECEA0JKA101	100	
C12	ECUV1C333KBV	0.033	
C13	ECUV1C333KBV	0.033	
C15	ECEA1HKA010	1	
C16	ECKD2H681KB	680P	s
C17	ECKD2H681KB	680P	s
C18	ECUV1H102KBV	0.001	
C19	ECUV1H102KBV	0.001	
C21	ECUV1H103KBV	0.01	
C22	ECEA1CKA100	10	
C25	ECUV1C333KBV	0.033	
C26	ECEA1HKA010	1	
C27	ECUV1C683KBV	0.068	
C29	ECEA1CKA100	10	
C30	ECUV1H120JCV	12P	
C31	ECUV1C153KBV	0.015	
C34	ECEA0JU471	470	
C36	ECKD1H103KB	0.01	s
C38	ECKD1H103KB	0.01	s
IC1-C1	ECUV1H103KBV	0.01	
IC1-C2	ECUV1C104KBV	0.1	
		(OTHERS)	
CN1	WBX10SS4AALM	CONNECTOR	s
SA1	PQVDDSS301L	VARIATOR (SURGE ABSORBER)	s
X1	PQVBZTA3.58M	CRYSTAL OSCILLATOR	

17.2. Accessories And Packing Materials

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQJA10075Z	CORD, TELEPHONE	
A2	PQJA212N	CORD, HANDSET (for KX-TS500FXB)(for KX-TS500FXC) (for KX-TS500FXH)(for KX-TS500FXR)	
A2	PQJA212M	CORD, HANDSET (for KX-TS500FXW)	
A3	PQJXE0501Z	HANDSET (for KX-TS500FXB)	
A3	PQJXE0527Z	HANDSET (for KX-TS500FXC)	
A3	PQJXE0529Z	HANDSET (for KX-TS500FXH)	
A3	PQJXE0518Z	HANDSET (for KX-TS500FXR)	
A3	PQJXE0511Z	HANDSET (for KX-TS500FXW)	
A4	PQX13858Z	INSTRUCTION BOOK	
A5	PQW13159Z	LEAFLET	
P1	PQPK14181Z	GIFT BOX	


17.1.3. Operational P.C.Board Part

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PQWP2TS500MX	OPERATIONAL P.C.BOARD ASS'Y (RTL)	

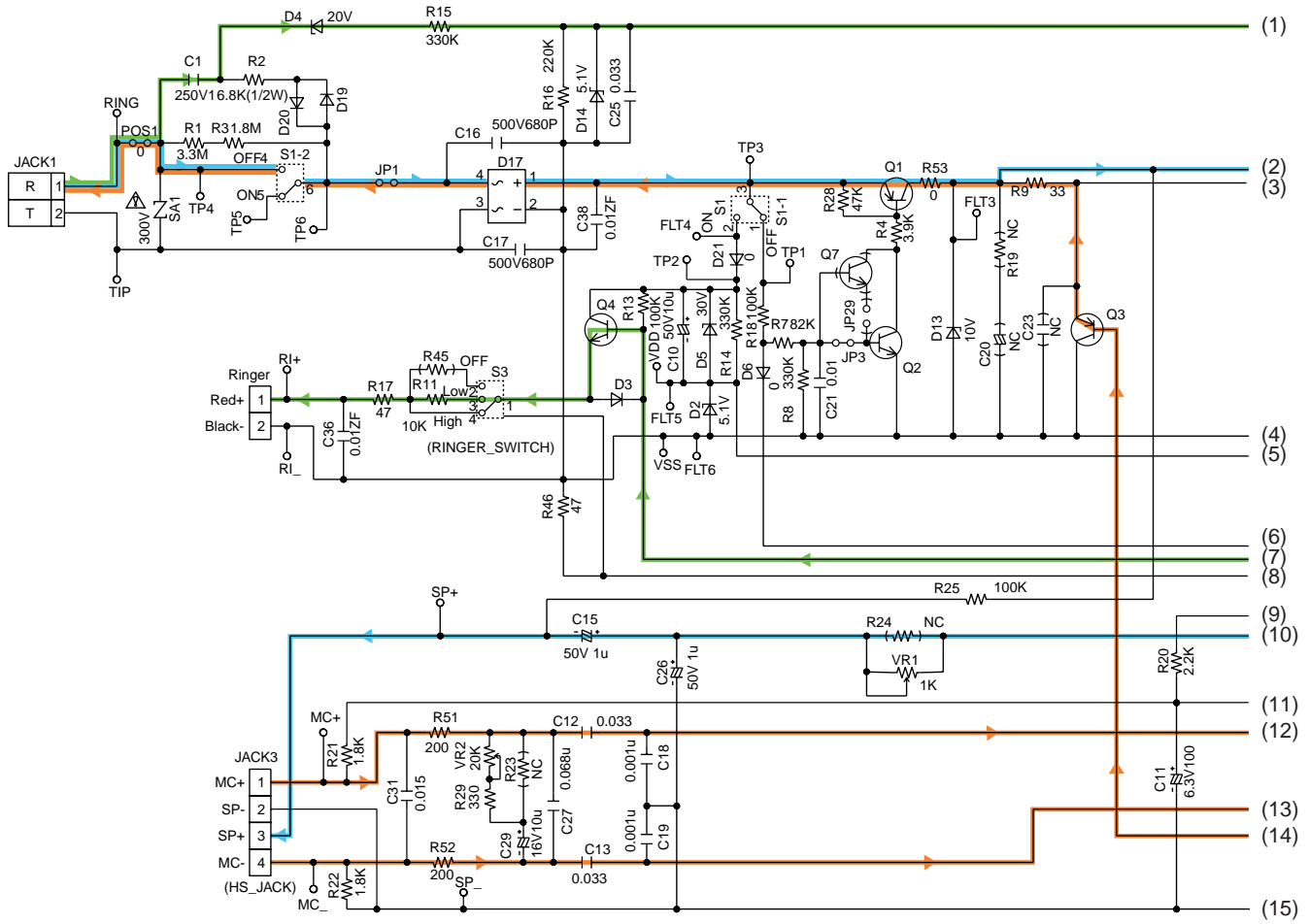
18 FOR SCHEMATIC DIAGRAM (SCHEMATIC DIAGRAM)

1. DC voltage measurements are taken with electronic voltmeter from negative terminal.
2. This schematic diagram may be modified at any time with the development of new technology.

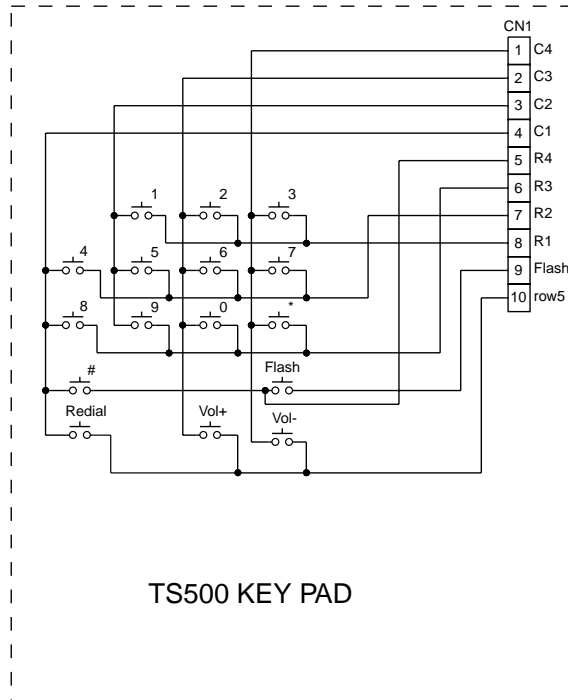
Important Safety Notice:

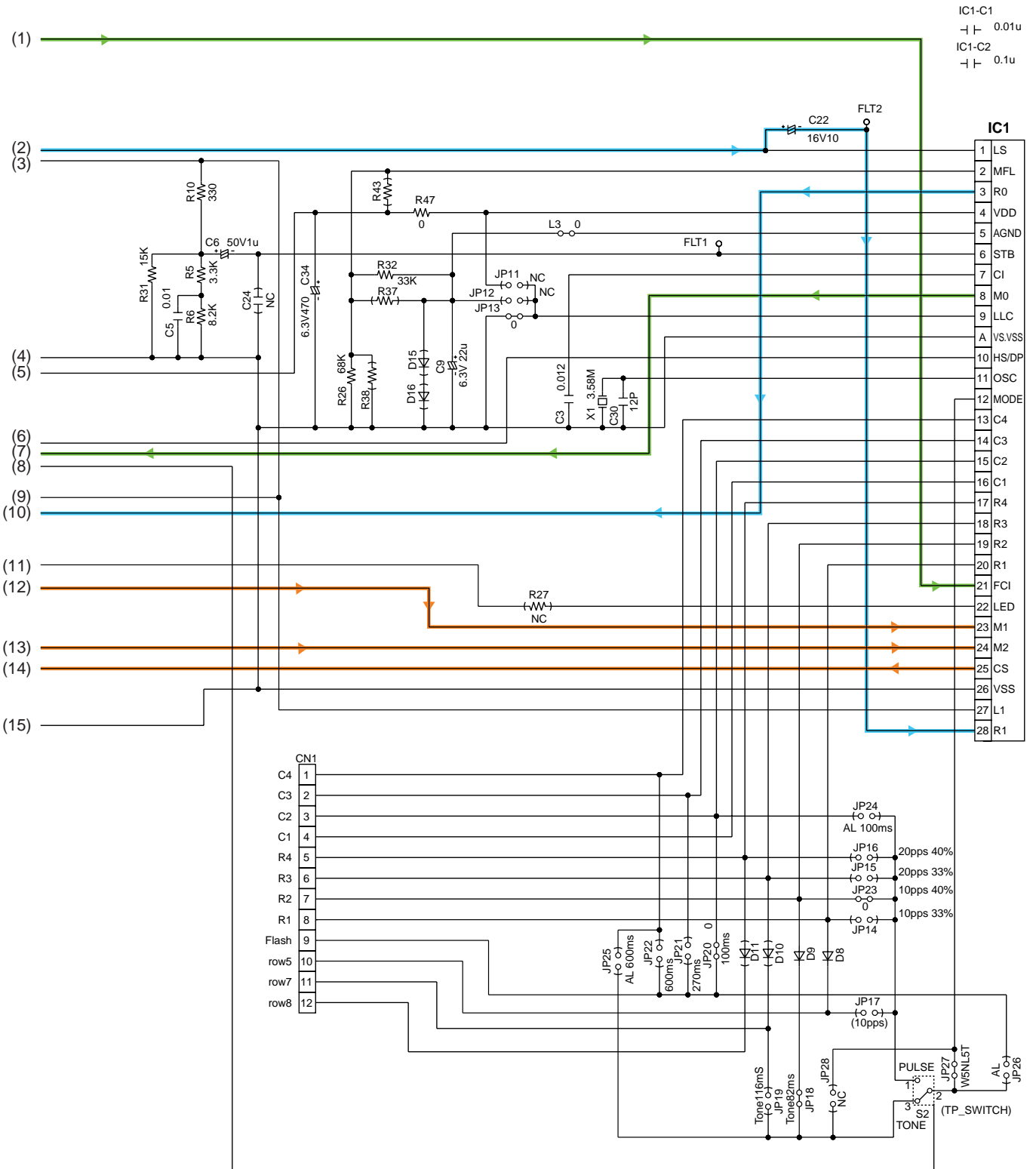
Components identified by  mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

19 SCHEMATIC DIAGRAM



- JJ1
- JJ2
- JJ3
- JJ4



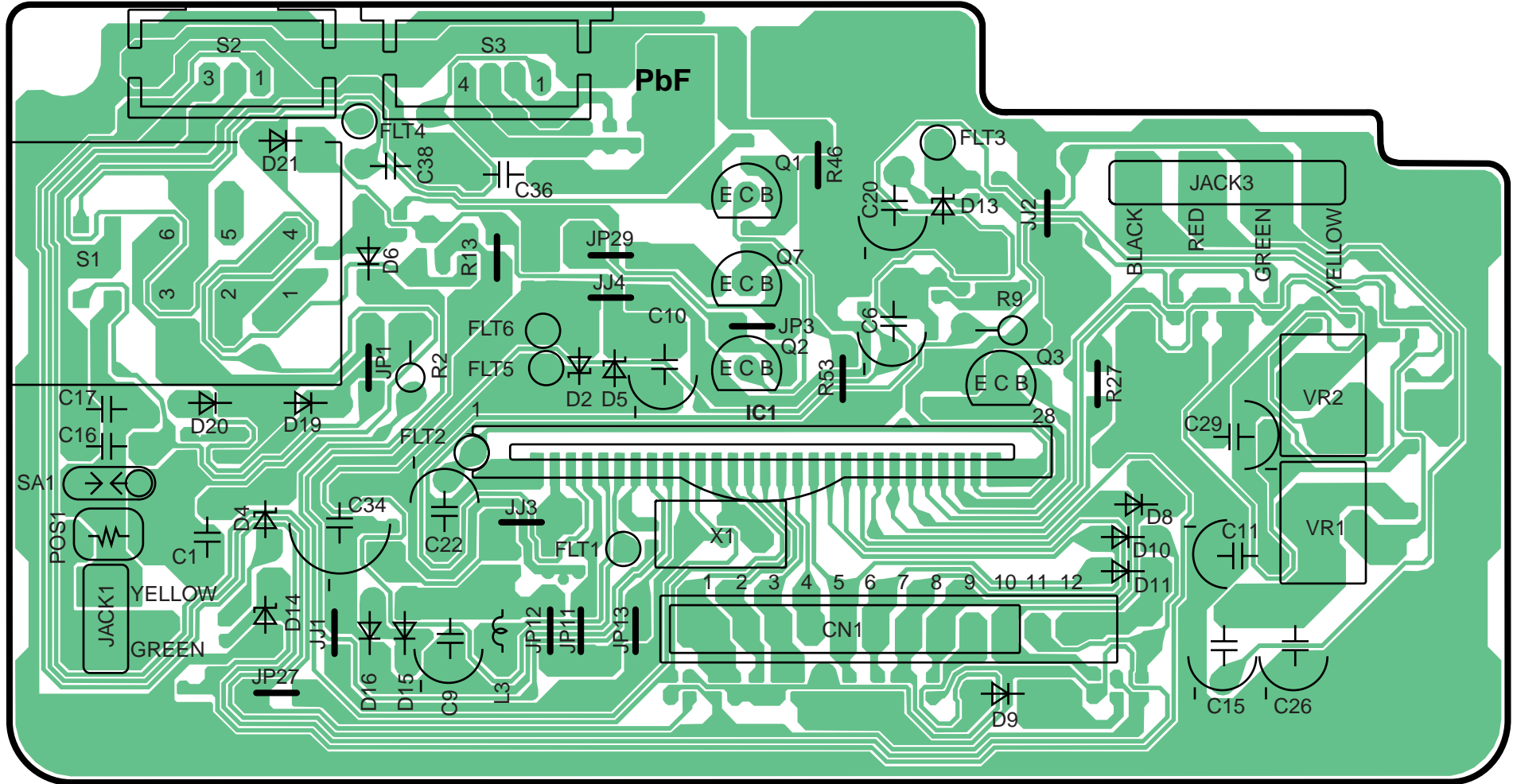


KX-TS500FXB/FXC/FXH/FXR/FXW SCHEMATIC DIAGRAM

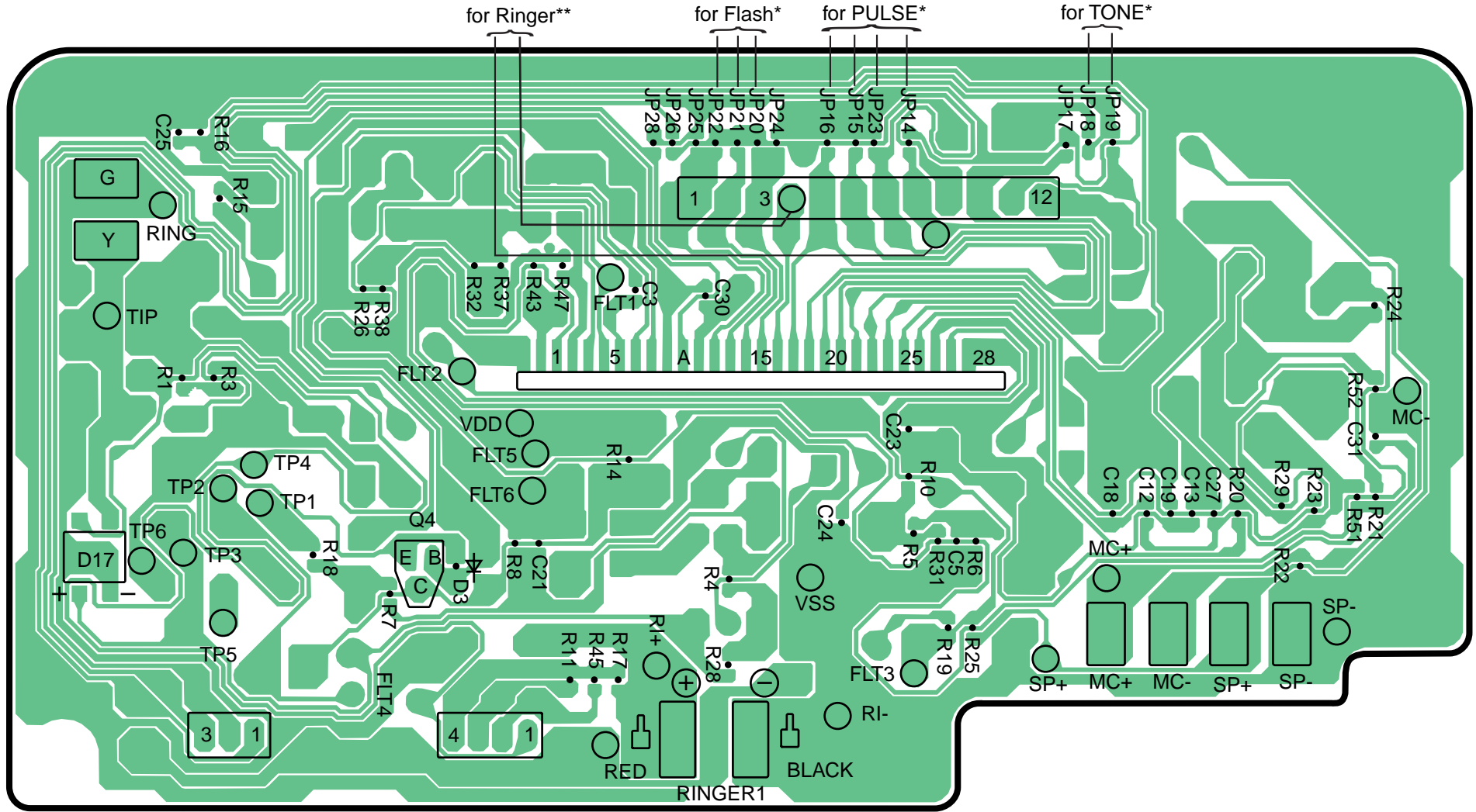
19.1. Memo

20 CIRCUIT BOARD

20.1. Main (Component View)



20.2. Main (Flow Solder Side View)



KX-TS500FXB/FXC/FXH/FXR/FXW CIRCUIT BOARD (Main) Flow Solder Side View

*: Refer to **OPTION JUMPER TABLE** (P.15)

** : Refer to **Ringer Circuit** (P.18)

20.3. Operation (Flow Solder Side View)

