

CIRCUIT DESCRIPTION

OPERATING PRINCIPLE OF THE TELEPHONE

The circuit of the telephone consists of Polarity guard circuit, High voltage protecting circuit, Electronic ringing tone circuit, Switch circuit, Dialing circuit and Speech circuit.

Basic Operating Principle:

In on-hook state, hook switch is being disconnected, only the ringing tone circuit is connected with the telephone line. When there is ringing signal coming from the telephone line, it is transmitted to ringing tone circuit by C3 and C54, then drive the phone to ring.

In off-hook state, hook switch and switch circuit are being closed, the feeding current is transported to CPU, speech circuit and dialing circuit, now dialing and conversation and so on can be operated on the phone.

Critical Components:

The thunder-proof component VR1 (TPA200): Protect the phone from thunder destroyed. When the thunder happens to the phone, it can be broken down and release the high voltage out, so that the high voltage can't come into the inner circuit to avoid the phone being destroyed by it. If so, only replace the Thunder-proof component to resume the phone.

CPU: Main controller with dialer, decoder, LCD driver and main function options, etc.

1.0 HIGH VOLTAGE PROTECTING CIRCUIT

This part circuit contains VR1 and other accessorial components. They can short the high voltage exceeding 200V from telephone line, so protect the phone from the high voltage destroyed.

2.0 ELECTRONIC RINGING TONE CIRCUIT

Ringing tone signal of the telephone is an output of CPU, and it is transmitted to a ringing amplifying circuit to be amplified. Ringing amplifying circuit consists mainly of the integrated IC KA2411 and its accessorial circuits.

When the handset is in the cradle position, AC voltage from telephone line is coupled through C3 & C54 and is rectified by a bridge rectifier (D8-D11), then makes a voltage output, which supplies power for ringing amplifying circuit (KA2411, etc). Subsequently the ringing output is transmitted to ringing amplifying circuit to be amplified by KA2411. And finally it is transmitted to buzzer to send ringing tone out.

3.0 DIALING CIRCUIT

Dialing circuit consists of CPU's dialer, key board, Q5 and its accessorial components, switch circuit (Q1 and Q2) and its accessorial circuits. When hook switch is closed and Q1 and Q2 are opened, dialing can be operated.

SERVICE MANUAL

Dialing mode includes Pulse and Tone and they can be set by CPU directly.

When select Tone dialing mode by the P/T slide switch, dial the phone number on key board, then the number information is sent to CPU. After analyzing CPU makes an output of dual audio frequency signal from its DTMF pin. Then the signal is transmitted to telephone line after amplified by Q5.

When select Pulse dialing mode, dial the phone number on key board, then the number information is sent to CPU. After analyzing CPU makes a pulse signal from its DPO pin, the pulse signal makes the level of DPO pin turn to high or low in order to control the switch transistors Q1 and Q2 to open or close. The times of open and close depends on pulse quantity of pulse signal. For example, quantity of pulse is 9, then DPO has 9 times change of high and low to control the switch transistors to open and close 9 times. Then the open and close signals for the dialed numbers are transported to telephone line.

4.0 SWITCH CIRCUIT

Switch circuit consists of Q1 and Q2 and its accessorial circuits. It mainly performs controlling the on-hook or off-hook of the telephone. And when the telephone is in on-hook state, the circuit supplies operating voltage for the telephone.

5.0 SPEECH CIRCUIT

Speech circuit consists of handset transmitting & receiving amplifying circuit.

a. Handset transmitting amplifying circuit

It consists of handset Microphone M1, primary amplifier Q6, secondary amplifier Q7 and their accessorial circuits. The handset Microphone is supplied power via R71, it can change the speech signal to electricity signal, then is coupled by C25 to Q6 to be amplified. Subsequently it is sent to Q7 to be amplified again and changed to voltage signal, which is sent to telephone line.

b. Handset receiving amplifying circuit

It consists of Receiver REC1, amplifier Q8 and their accessorial components. The voltage signal from telephone line is coupled by C6 to Q8 to be amplified, then is sent to the Receiver to be changed to speech signal. Then you can hear the other party's voice from handset.

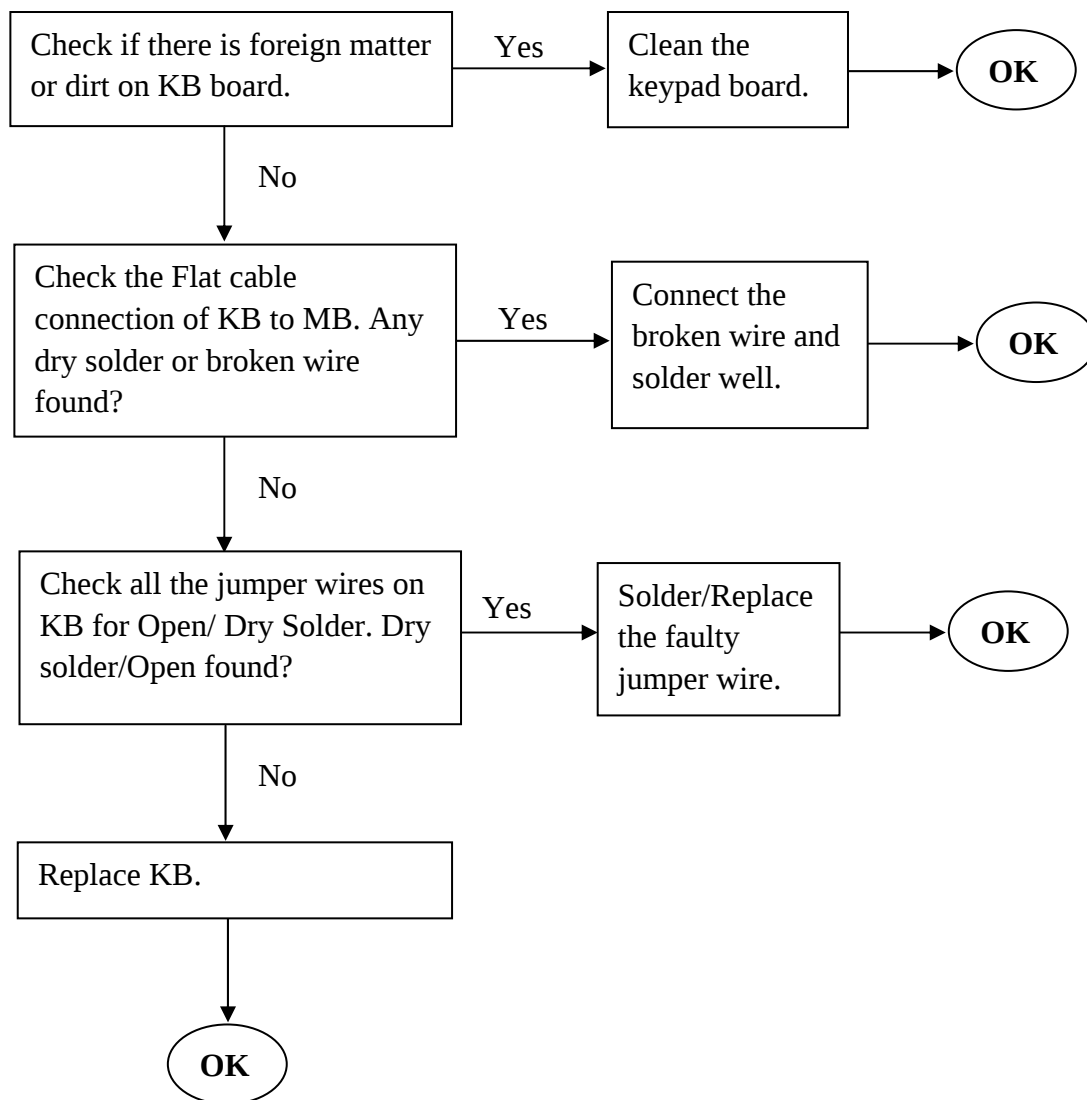
TROUBLE SHOOTING

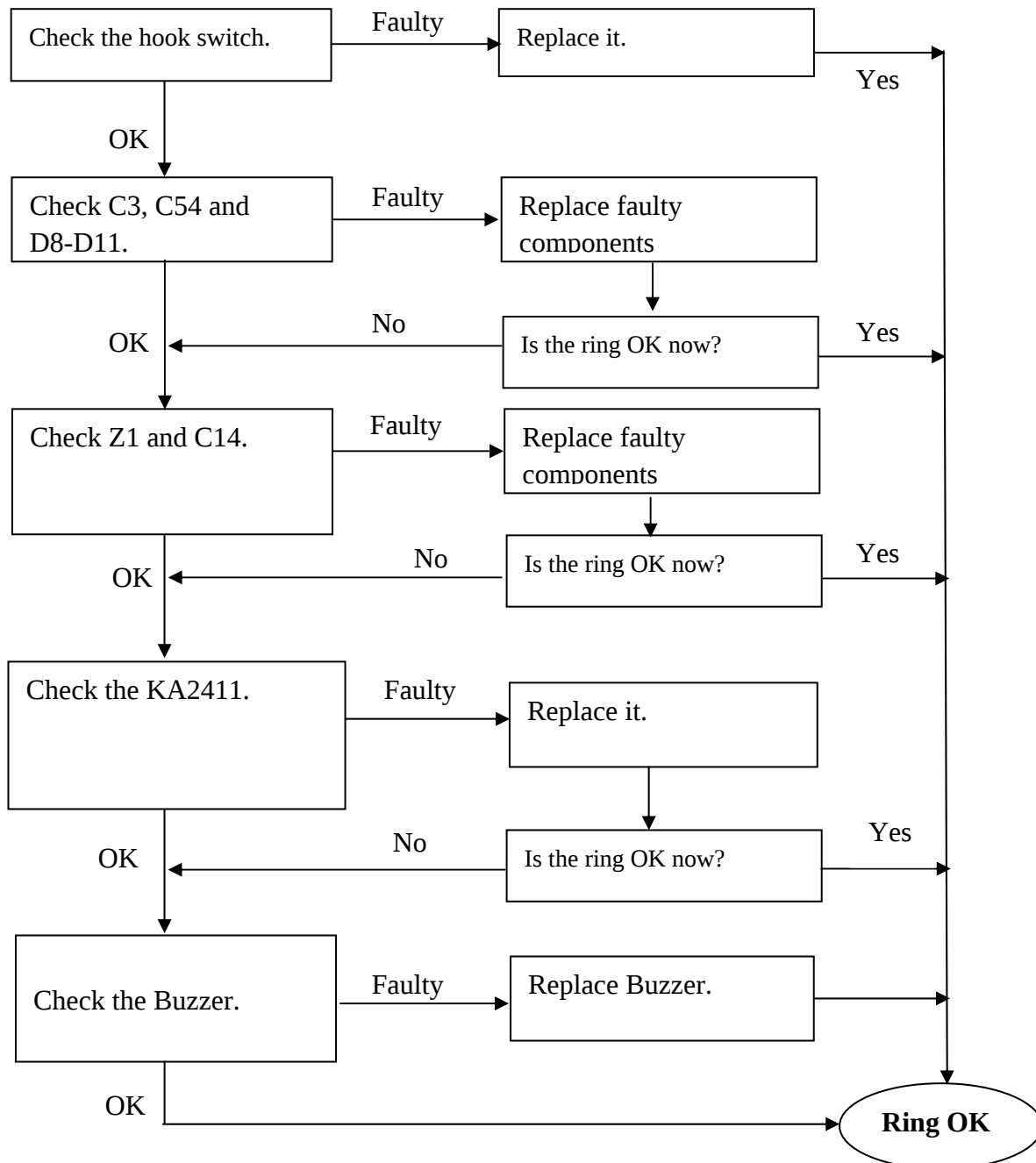
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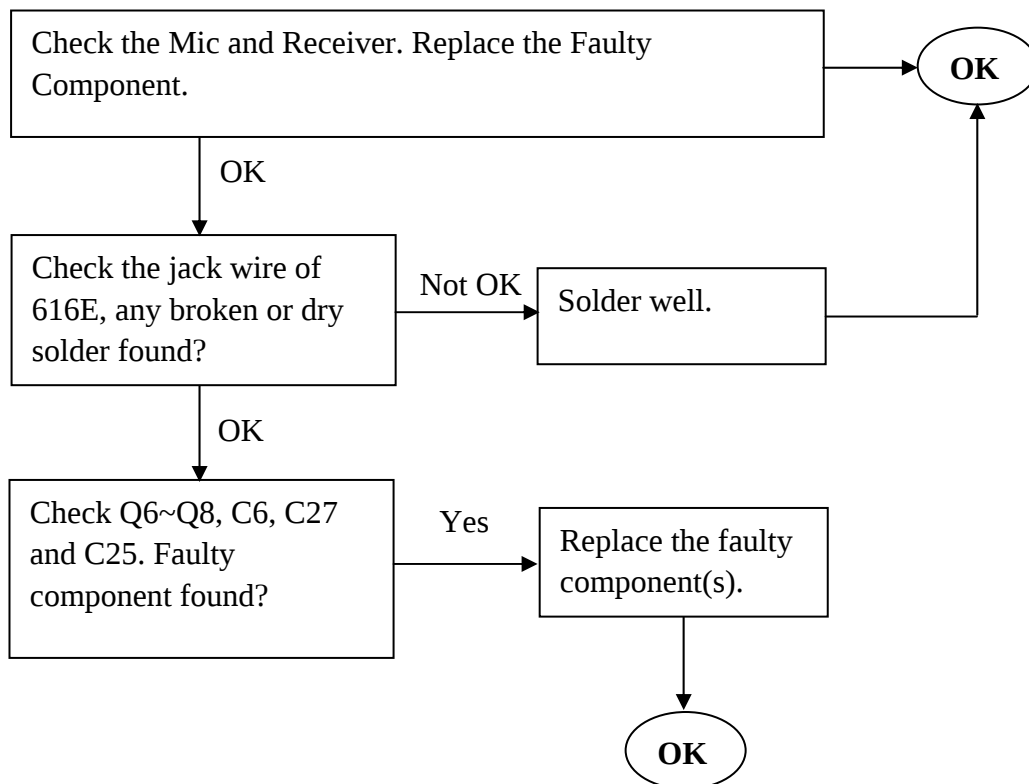
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Problem 1: Partial dialing (Complete Row or Column of keypad not working)



Problem 2: No ring


Problem 3: No handset receiving and transmitting.

Problem 4: No Pulse & Tone dialing