FUTURE KIT

HIGH QUALITY ELECTRONIC KITS

TELEPHONE EXPERIMENTAL BOARD
CODE 324   (LEVEL 1)

This circuit is designed for training board which suitable to learn the operation of telephone. The circuit can be set the dialing mode to tone system or pulse system. Line out point is used for connect the telephone.

Technical specifications:
- no need power supply
- PCB dimensions : 4.91 x 4.05 inches.

How to works:

The circuit can be divided into three parts: ringing tone, premic and headphone, tone encoder and key pad.

In normal operation, switch SW1 is slide to "STAND BY" position and the voltage at TEL line is DC voltage. C14 will blocks any DC voltage. When have the ringing tone into the circuit, the ringing tone is fed to bridge rectified by D5 to D7 and 25 volts low-drop voltage by ZD4. IC1/1 and IC1/2 at pin 7 is fed to the input of IC1/3 at pin 10 which is connected to the buffer. After the frequency is drive to pizzo buzzer.

When slide the switch SW1 to "ON" position, the ringing tone is stop the operation. The premic and headphone part is operate. Transistor TR2 predrive the signal and TR1 modulate the signal and the voltage. This the signal is fed to the TEL line. TR3 and TR4 amplifier the signal drives the speaker.

The rest of the circuit is used to controlthe encoder tone. At the heart of the circuit is IC2. If you push the key pad, IC2 will create the tone frequency. The output of IC2 at pin 12 is fed to TR7. After the tone frequency is modulate to the TEL line. SW2 is used to selected the pulse system or the tone system.
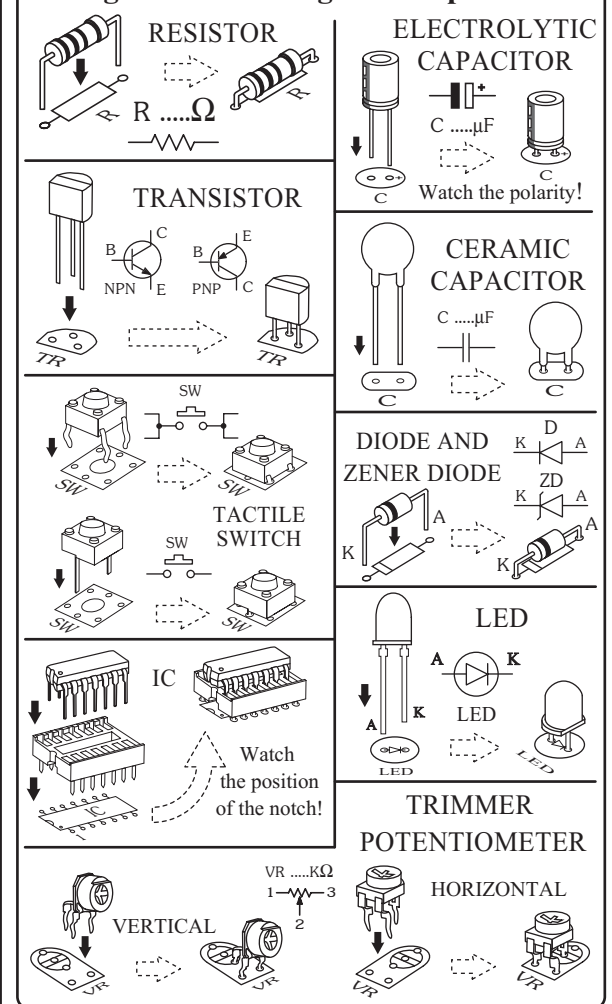
PCB assembly:

Shown in Figure 3 is the assembled PCB. Starting with the lowest height components first, taking care not to short any tracks or touch the edge connector with solder. Some tracks run under components, and care should be taken not to short out these tracks. If the pins will not enter the holes with ease, use a small drill to slightly enlarge the opening. All components with axial leads should be carefully bent to fit the position on the PCB and then soldered into place. Make sure that the electrolytic capacitors are inserted the correct way around. Some components are particularly sensitive to heat (ie: Transistors, IC's, diodes etc.) extra care must be taken to only apply the iron for as little time as possible, using a pair of pliers to grip the leads will help conduct heat away. Trim components leads with wire cutters to prevent excess lengths causing a short circuit. Now check that you really did mount them all the right way round!
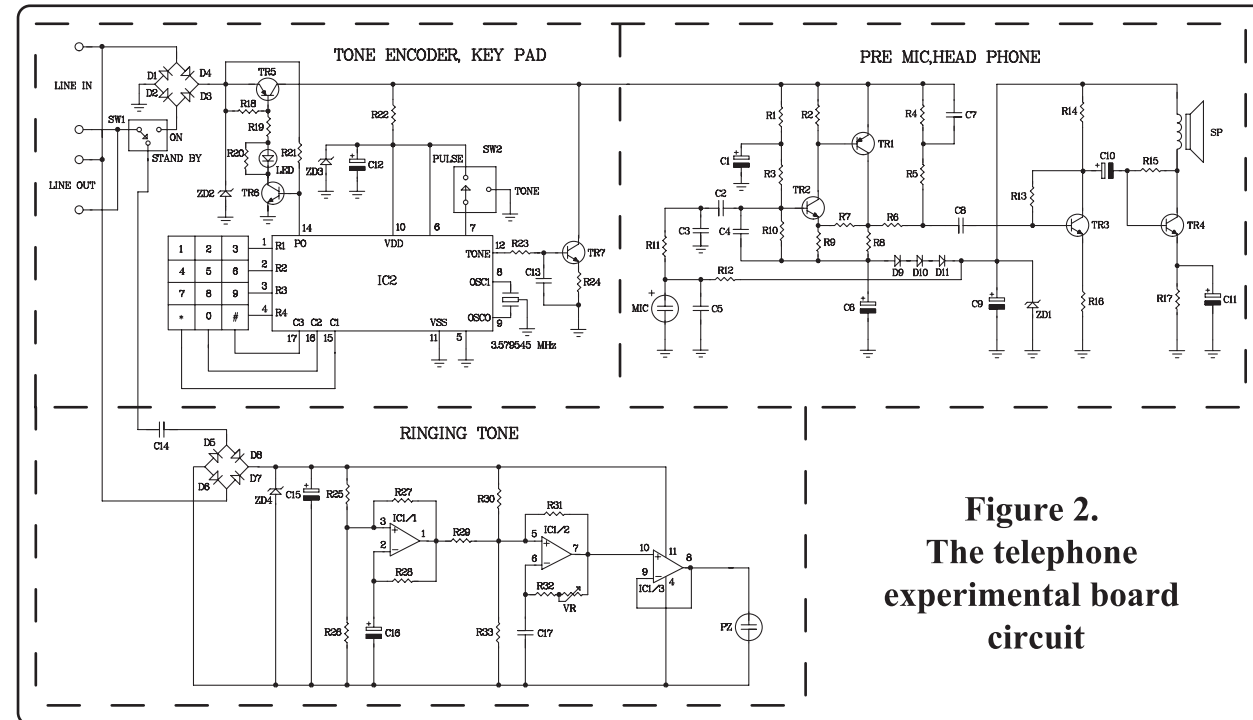
Testing:

Connect the telephone cable to "LINE IN" point. Slide switch SW1 to "STAND BY" position and slide switch SW2 to "TONE" or "PLUSE" position following the dialing system. Whenever the phone ring, adjust the VR100K until the ringing tone has the good sound. Slide switch SW1 to "ON" position, the ringing tone is stop and LED is light on. Use it as your standard telephone. Push the key pad will hear the tone signal from speaker.

Figure 1. Installing the componants

RESISTOR — R .....Ω

ELECTROLYTIC CAPACITOR — C .....μF — Watch the polarity!

TRANSISTOR — B C / NPN E — B E / PNP C — TR — TR

CERAMIC CAPACITOR — C .....μF — C

SW — TACTILE SWITCH — SW — SW

DIODE AND ZENER DIODE — K D A — K ZD A — A K — A K

IC — Watch the position of the notch!

LED — A K — A K — LED — LED — LED

VR .....KΩ — 1 — 3 — 2 — VERTICAL — VR — VR

TRIMMER POTENTIOMETER — HORIZONTAL — VR — VR

Troubleshooting:

The most problem like the fault soldering. Check all the soldering joint suspicious. If you discover the short track or the short soldering joint, re-solder at that point and check other the soldering joint. Check the position of all component on the PCB. See that there are no components missing or inserted in the wrong places. Make sure that all the polarised components have been soldered the right way round.

Figure 2. The telephone experimental board circuit

Figure 3. Connections

TELEPHONE

TELEPHONE WALL OUTLET

PZ

NOTE:

FUTURE BOX FB09 is suitable for this kit.

FK324-1

CONDENSER MICROPHONE

EARPHONE