

2023 Continuity Tester Kit

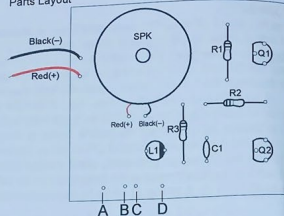


Kit Assembly Instructions

C6385 CONTINUITY TESTER KIT

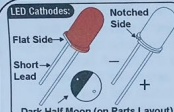
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Figure 1
Parts Layout



PARTS LIST

- C1 .01 μ F Capacitor (103)
- L1 Red LED
- Q1 2N3904 Transistor
- Q2 2N3906 Transistor
- R1 2K Ω Resistor
- R2 2M Ω Resistor
- R3 47 Ω Resistor
- SPK Mini Speaker
- Misc. 9V Snap, PC Board, Wire
- Double Stick Tape



Dark Half Moon (on Parts Layout)

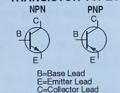
There are three main ways to determine the cathode side of the LED. The Parts Layout will indicate the cathode side of the LED by a dark half moon shape. On the physical part, usually, the cathode can be identified by one of three ways:

- 1) The lens of the LED has a flat side when viewed from the top (sometimes difficult to see).
 - 2) The shorter lead of the LED.
 - 3) If there is no flat side on the LED, there will be a notch in the lens of the LED.
- Please Note: Some LEDs may have both a flat side and a notched side. With these LEDs, always use the flat side to locate the cathode of the LED.

Figure 3
LED (cathode) information

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TRANSISTOR TYPES



B=Base Lead
C=Emitter Lead
E=Collector Lead

TRANSISTOR CASE



Figure 4
Transistor Information

RESISTOR COLOR CODE

BAND	1st	2nd	MULTIPLIER
COLOR	DIGIT	DIGIT	
BLACK	0	0	1
BROWN	1	1	10
RED	2	2	100
ORANGE	3	3	1,000 (K)
YELLOW	4	4	10,000
GREEN	5	5	100,000
BLUE	6	6	1,000,000 (M)
VIOLET	7	7	10,000,000
GRAY	8	8	100,000,000
WHITE	9	9	1,000,000,000

*TOLERANCE: NO COLOR 20%, SILVER 10%, GOLD 5%

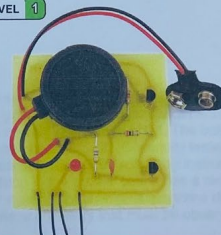
Figure 5
Resistor Color Code

CHANEY
ELECTRONICS, INC.



C6385 - CONTINUITY TESTER KIT

SKILL LEVEL 1



SOLDERING PRECAUTIONS

Electronic components in this kit are solder plated. Solder contains lead and therefore, do not put components in your mouth. Always wash your hands after working with components. Students under the age of 13 should not build this kit. Soldering requires adult supervision.

Made in the U.S.A.

Rev 5/10/17 WB

Assembly Instructions

C6385 CONTINUITY TESTER KIT

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Tools Needed for Assembly:

- Small Pencil type soldering iron (40 watts rating or less)
- Pair of wire cutters, a screwdriver & needle nose pliers

- Pair of safety goggles or safety eyeglasses
- Damp sponge
- Fresh Rosin or Resin Core Tin/Lead solder

ASSEMBLY INSTRUCTIONS

1. Assemble per Parts Layout (Figure 1), Parts List and Schematic (Figure 6) using rosin or resin core tin/lead solder only (acid core solder and acid fluxes will ruin the kit). Make sure to wear your safety eyeglasses or goggles before you start.
2. Observe flat side on transistors Q1 and Q2 for correct installation of these components (see Figure 4 for more transistor information). Install LED L1 with cathode side (see Figure 3 for LED cathode info) in the direction indicated by the black half moon in Parts Layout (Figure 1).
3. Install mini speaker (SPK) by adding a piece of double stick tape to the backside. Place the mini speaker on circuit board at place shown on Parts Layout, pressing firmly to attach the mini speaker (SPK) to the PC board. Now connect wires to PC board as shown in Parts Layout. No polarity needed.
4. Install battery snap observing correct polarity as shown by color of leads.
5. After all components have been installed, re-check assembly for correct parts placement and good solder joints.
6. Connect pieces of wires to points A, B, C, D (**Note:** These wires can be several feet long if desired).

TESTING & OPERATION

1. To test your continuity tester, simply connect a fresh 9V battery to snap and short together wire A to wire B. Your continuity tester should emit a pleasant buzzing tone and the red LED should light up. Now with wire A still connected to wire B, connect wire C to wire D, the tone should remain on but the LED should go out.
2. To operate the continuity tester, use wire A and wire B to test normal continuity of circuit traces, wires, fuses, speakers, lamps, etc. Always make sure that there is no power going to the circuit or item that you are going to test. When wire A and B have a high conductivity (low resistance) connected between them, the unit will emit a pleasant tone and the LED will light. If only the LED lights up but there is no tone the resistance between the wires A and B is probably over one thousand ohms. If you want to verify a short, connect wire A to wire B and test with wires C and D. The tone will remain on (but change slightly) and the LED will go out when a short (very low resistance) is measured.
3. Another good application of the continuity tester is for a simple test of diodes and LEDs. If the part is good, you will notice in one direction the kit won't buzz, in the other it won't.

THEORY OF OPERATION

The C6385 Continuity Tester Kit uses a two transistor direct coupled oscillator made up of transistors Q1 and Q2. The transistor Q1 is an NPN type and it drives Q2, which is a PNP type transistor. The feedback necessary to sustain oscillations comes from the collector lead of Q2 by way of C1 and R1 to the base of Q1. The output of the oscillator comes also from the collector of Q2 and it drives the miniature speaker (SPK). Continuity testers are typically just a buzzer that sounds when the circuit path under test is "made complete". The assembly instructions contain a description on how to use your continuity tester, which in addition to the buzzer sound has a red LED which lights up. The LED is made up of a PN junction of semiconductor material that converts electrons directly into visible photons. Because a LED is made up of a PN junction, they have a polarity that must be observed.

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FOIL PATTERN OF PC BOARD

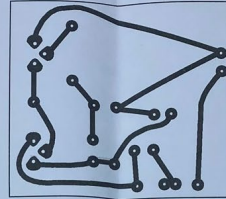
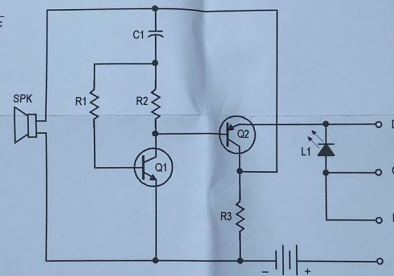


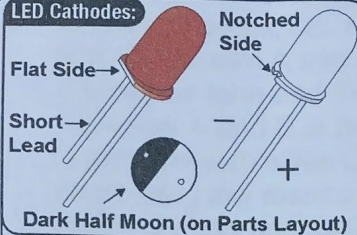
Figure 6
Schematic



TROUBLE SHOOTING HINTS

1. First of all, make sure that the solder used to build the kit was rosin core. If acid core solder was used, the kit will be conducting voltage to various points where it should not and the kit will be **DESTROYED**.
PLEASE NOTE: We cannot repair any kit that was assembled using acid core solder!
2. Check to make sure that the transistors Q1 and Q2 were installed with the flat side as shown (see Figure 4 for more transistor information).
3. Check all resistors against Resistor Color Code (Figure 5), Parts Layout and Parts List. Make sure that the snap is installed with polarity as shown. Is your 9V battery good?
4. Check to make sure that the cathode side of LED L1 is facing the direction shown (see Figure 3 for more LED cathode information).
5. If your kit still does not operate, re-check all assembly instructions.
If everything is correct, return your kit per our repair policy.

LED Cathodes:

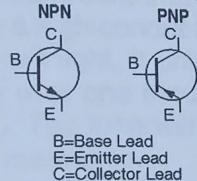


There are three main ways to determine the cathode side of the LED. The Parts Layout will indicate the cathode side of the LED by a dark half moon shape. On the physical part, usually, the cathode can be identified by one of three ways:

- 1) The lens of the LED has a flat side when viewed from the top (sometimes difficult to see).
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- Please Note: Some LEDs may have both a flat side and a notched side. With these LEDs, always use the flat side to locate the cathode of the LED.

Figure 3
LED (cathode) information

TRANSISTOR TYPES



TRANSISTOR CASE

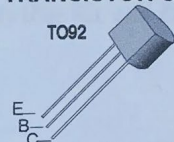


Figure 4
Transistor Information

RESISTOR COLOR CODE

BAND COLOR	1st DIGIT	2nd DIGIT	MULTIPLIER
BLACK	0	0	1
BROWN	1	1	10
RED	2	2	100
ORANGE	3	3	1,000 (K)
YELLOW	4	4	10,000
GREEN	5	5	100,000
BLUE	6	6	1,000,000 (M)
VIOLET	7	7	10,000,000
GREY	8	8	100,000,000
WHITE	9	9	1,000,000,000

*TOLERANCE: NO COLOR 20%; SILVER 10%; GOLD 5%

Figure 5
Resistor Color Code

Kit Assembly Instructions

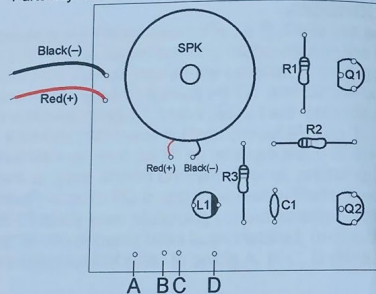
C6385 CONTINUITY TESTER KIT

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PARTS LIST

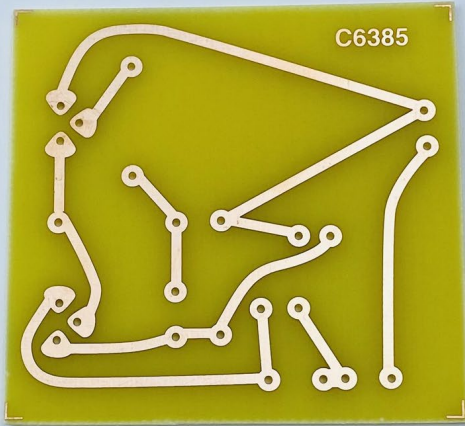
- C1 .01μF Capacitor (103)
- L1 Red LED
- Q1 2N3904 Transistor
- Q2 2N3906 Transistor
- R1 2KΩ Resistor
- R2 2MegΩ Resistor
- R3 47Ω Resistor
- SPK Mini Speaker
- Misc. 9V Snap, PC Board, Wire
- Double Stick Tape

Figure 1
Parts Layout



PC Board - Back area we
soldering components to board!

Top



PC Board - Front area we push
components through!

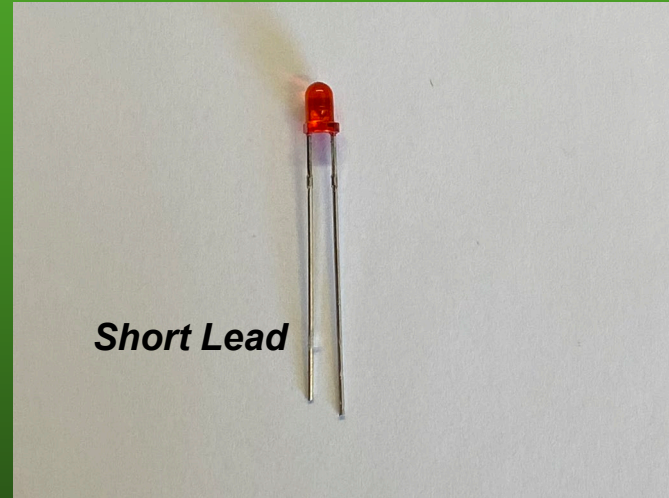
Top



C1: .01uF Capacitor (103) -
Polarity does not matter!



L1: Red LED - Polarity
Matters. Short lead and/or
Flat side is Cathode side!



Q1: 2N3904 Transistor - No Green
Line - Polarity Matters!



You can use magnifying glass
to read the numbers on the flat
side of transistor!

Q2: 2N3906 Transistor -
Green Line - Polarity Matters!



You can use magnifying glass to
read the numbers on the flat side of
transistor!

R1: 2K Ω Resistor - Polarity
Does Not Matter! Red-
Black-Red



R2: 2Meg Ω Resistor -
Polarity Does Not Matter -
Red-Black-Green-Gold



R3: 47 Ω Resistor - Polarity Does
Not Matter - Yellow-Purple-Black-
Gold



SPK: Mini Speaker - Polarity
Matters

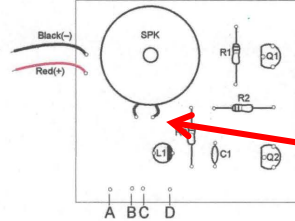


Kit Assembly Instructions

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Figure 1
Parts Layout

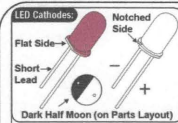


PARTS LIST

C1	.01μF Capacitor (103)
L1	Red LED
Q1	2N3904 Transistor
Q2	2N3906 Transistor
R1	2KΩ Resistor
R2	2Mega Resistor
R3	47Ω Resistor
SPK	Mini Speaker
Misc.	9V Snap, PC Board, Wire, Double Stick Tape

Important Note:

Some of the kits may include a mini-speaker that does not have a black and red wire attached. If that is the case, you will need to use the red wire included and cut two 3-inch length pieces. Remove the insulation and solder both wires to the mini-speaker and the other end to the board. There is no **Polarity** in this case. Note the new instructions shown on the left do not show **Polarity** with the mini-speaker connection in Figure 1.



Dark Half Moon (on Parts Layout)

There are three main ways to determine the cathode side of the LED. The Parts Layout will indicate the cathode side of the LED by a dark half moon shape. On the physical part, usually, the cathode can be identified by one of three ways:

- 1) The lens of the LED has a flat side when viewed from the top (sometimes difficult to see).
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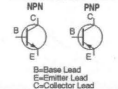
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Figure 3

LED (cathode) information

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TRANSISTOR TYPES



TRANSISTOR CASE



Figure 4
Transistor Information

RESISTOR COLOR CODE

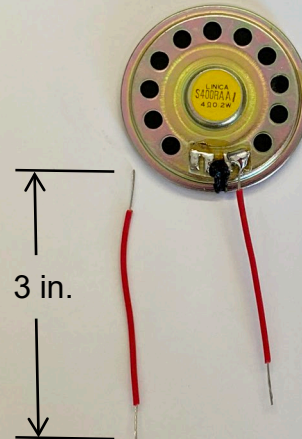
BAND	1st COLOR	1st DIGIT	2nd COLOR	2nd DIGIT	MULTIPLIER
BLACK	0	0	1	1	
BROWN	1	1	10	10	
RED	2	2	100	100	
ORANGE	3	3	1,000	1,000	Ω
YELLOW	4	4	10,000	10,000	Ω
GREEN	5	5	100,000	100,000	Ω
BLUE	6	6	1,000,000	1,000,000	Ω
VIOLET	7	7	10,000,000	10,000,000	Ω
GRAY	8	8	100,000,000	100,000,000	Ω
WHITE	9	9	1,000,000,000	1,000,000,000	Ω

*TOLERANCE: NO COLOR 20%; BROWN 10%; SILVER 10%; GOLD 5%

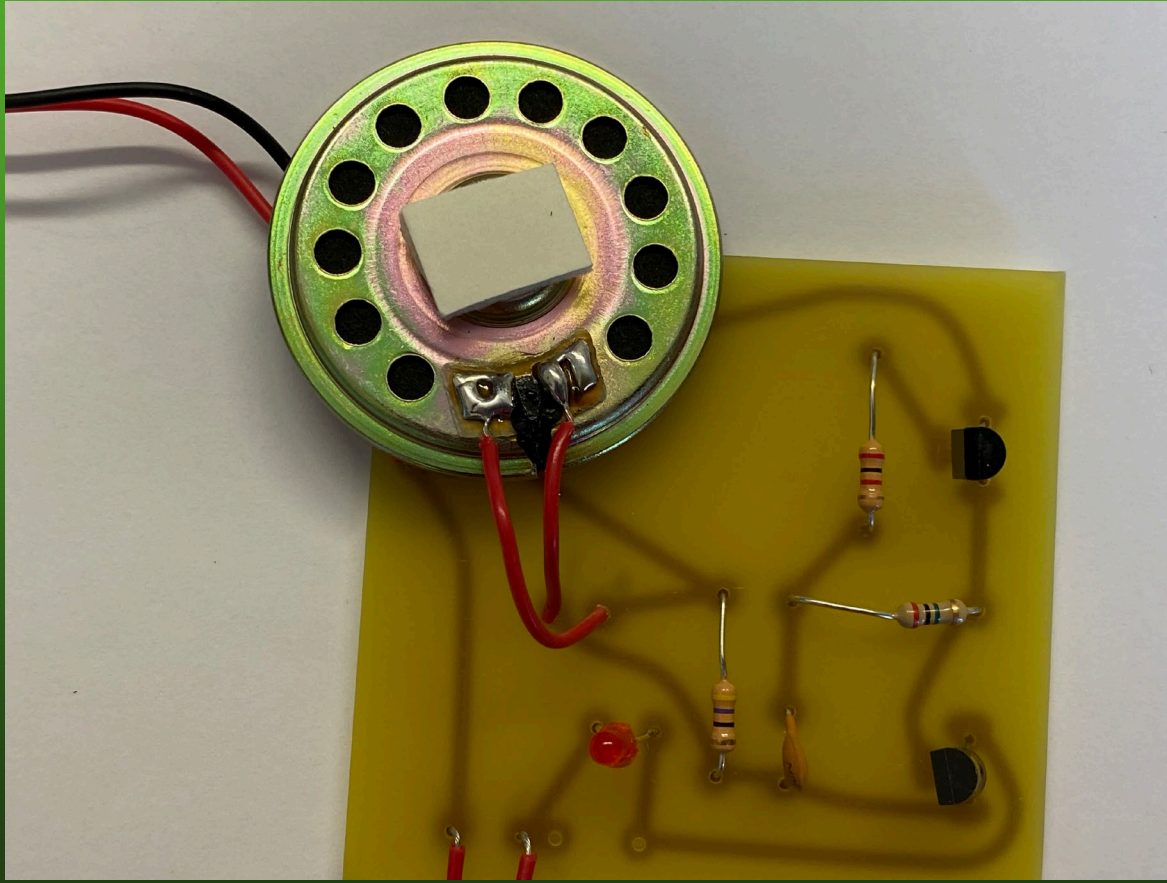
Figure 5
Resistor Color Code



One piece of red wire is shown soldered to the mini-speaker. Solder both to the speaker.



Final assembly of the speaker with two 3-inch wires soldered to the speaker and the opposite ends to the board. This step is only required if the speaker does not come with the wires already attached.



Double Stick Tape:



Wire: - We will replace with Alligator Clips! May be used if the mini-speaker does not include wires.



9 V Battery Snap: - Polarity Matters



Alligator Clip: We will cut in half and use in holes A and B only. Strip the insulation off the cut ends.



