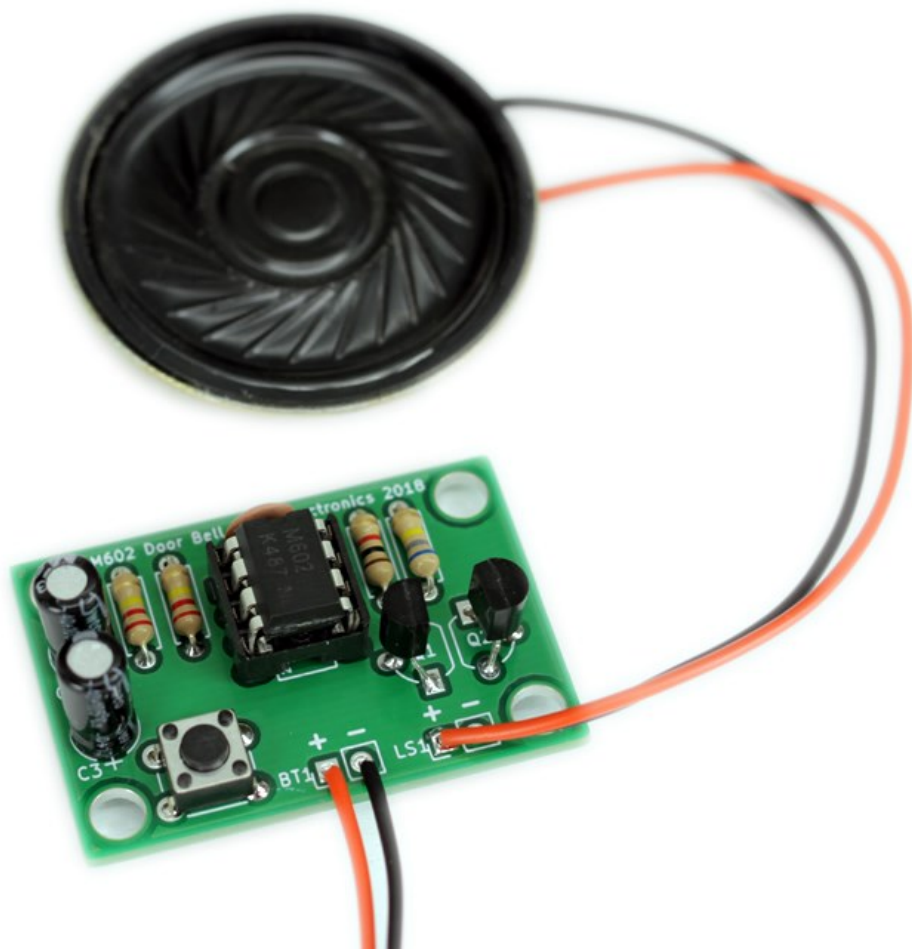


# M602 Door Bell Kit

MitchElectronics 2019

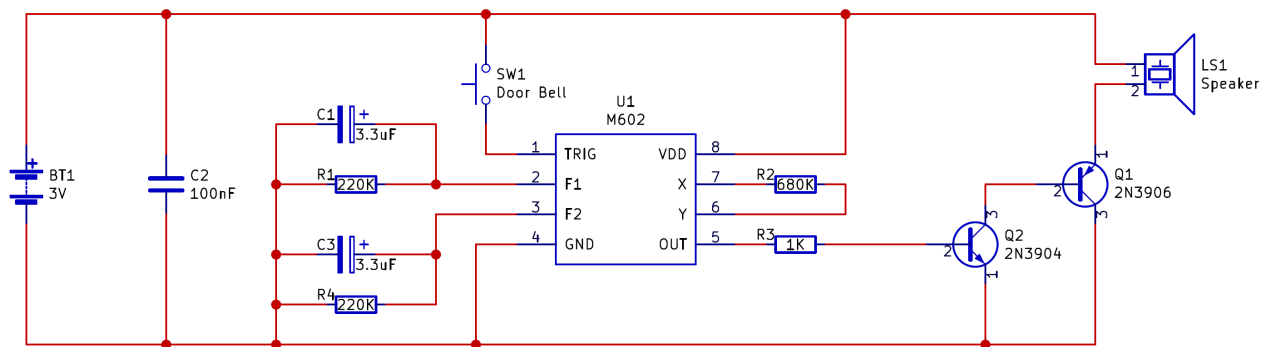


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# SCHEMATIC



## SCHEMATIC EXPLANATION

While some circuits are made up using discrete logic chips or microcontrollers this door bell kit uses a special integrated circuit that demonstrates how manufacturing an IC for a specific use can be more beneficial than using a custom solution. At the heart of the door bell kit is the M602 “ding-dong” IC which is an integrated circuit that only does one job: make a “ding-dong sound”!

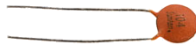
The IC is housed in an 8-DIP package and requires only a few external components to form a fully functional door bell that will alert users inside a home when someone presses the door bell. Pin 1, TG, is the trigger pin and this is connected to a switch which, when pressed, connects TG to the power rail. Pins two and three are listed as “F” in the datasheet and are required to connect to a special resistor / capacitor arrangement. While their exact function is not described it is assumed that they are for timing the individual dings. Pins 4 and 8 are for 0V and 3V respectively (power pins), while pin 5 is the output that connects to a PNP / NPN arrangement that is used for driving the external speaker. The last two pins, 6 and 7, are listed as X and Y and these are connected together with a 680kΩ resistor that is used for setting the internal oscillator.

**This circuit requires between 3V and 4V to operate correctly and so a suitable power supply is required. The Simple Power Supply kit can be used for this purpose as it has a 3.3V output but two AA batteries can be used as well.**

A ding-dong sound can be generated a number of ways including discrete logic chips that enable two oscillators for two distinctive frequencies. Another way for creating a more elaborate door bell is with the use of a microcontroller which can produce any waveform possible which leads to the possibility of playing music or even a short recorded message. However, considering the number of houses on the planet that require a door bell and how most want a simple “ding-dong”, these alternative solutions can be more costly, use more PCB space, and require several design stages. The use of a standardised IC (like the M6502) can see door bells produced in a much shorter timeframe.

# MATERIALS

Check that you have the following components

| Component       | Component Name | Quantity | Looks like                                                                            |
|-----------------|----------------|----------|---------------------------------------------------------------------------------------|
| M6502 IC        | U1             | 1        |    |
| 8-DIP Socket    | U1             | 1        |    |
| 100nF Capacitor | C2             | 1        |    |
| 3.3uF Capacitor | C1, C3         | 2        |     |
| 1K Resistor     | R3             | 1        |     |
| 220K Resistor   | R1, R4         | 2        |     |
| 680K Resistor   | R2             | 1        |    |
| Speaker         | LS1            | 1        |  |
| Switch          | SW1            | 1        |  |
| 2N3904          | Q2             | 1        |   |
| 2N3906          | Q1             | 1        |   |
| Red, Black Wire | LS1, BT1       | 2 Each   |   |
| PCB             | -              | 1        |   |

# CONSTRUCTION

## Download the electronics construction manual

To learn how to construct circuits on PCBs download the Electronics Construction Manual from MitchElectronics using the link below. This document shows you how to install all electronic components used in MitchElectronics kits. The list below shows the sections relevant to this kit so do not worry if you see component sections in the document that don't come with this kit!

[www.mitchelectronics.co.uk/electronicsConstructionManual.pdf](http://www.mitchelectronics.co.uk/electronicsConstructionManual.pdf)

## Relevant sections in the electronics construction manual

Resistors

Capacitors

Transistors

ICs

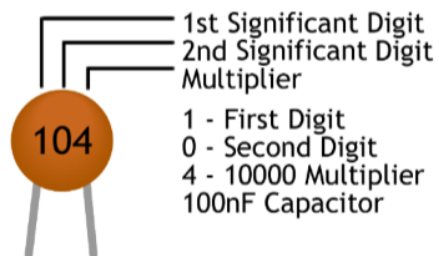
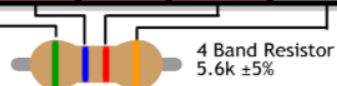
Speakers

Switches

Wires

## RESISTOR AND CAPACITOR IDENTIFICATION

| Colour | 1 <sup>ST</sup> Band | 2 <sup>ND</sup> Band | 3 <sup>RD</sup> Band | Multiplier | Tolerance |
|--------|----------------------|----------------------|----------------------|------------|-----------|
| BLACK  | 0                    | 0                    | 0                    | 1Ω         |           |
| BROWN  | 1                    | 1                    | 1                    | 10Ω        | ±1%       |
| RED    | 2                    | 2                    | 2                    | 100Ω       | ±2%       |
| ORANGE | 3                    | 3                    | 3                    | 1kΩ        |           |
| YELLOW | 4                    | 4                    | 4                    | 10kΩ       |           |
| GREEN  | 5                    | 5                    | 5                    | 100kΩ      | ±0.50%    |
| BLUE   | 6                    | 6                    | 6                    | 1MΩ        | ±0.25%    |
| VIOLET | 7                    | 7                    | 7                    | 10MΩ       | ±0.10%    |
| GREY   | 8                    | 8                    | 8                    |            | ±0.05%    |
| WHITE  | 9                    | 9                    | 9                    |            |           |
| GOLD   |                      |                      |                      |            | ±5%       |
| SILVER |                      |                      |                      |            | ±10%      |



1st Significant Digit  
2nd Significant Digit  
Multiplier  
1 - First Digit  
0 - Second Digit  
4 - 10000 Multiplier  
100nF Capacitor

## IMPORTANT INFORMATION

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*RoHS Compliant Kit (Lead free)*



*Low Voltage Kit*



*Caution! Soldering Required*