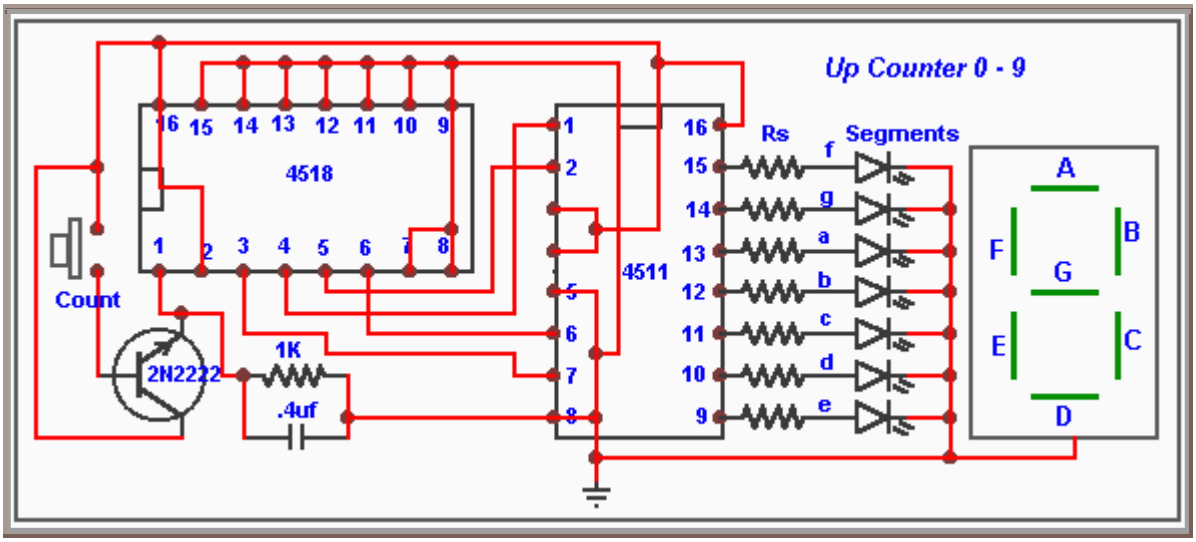
One Digit Event Counter

This is a simple one digit counter using CMOS instead of the traditional TTL ICs . Using CMOS makes it possible to use a power supply from 5 to 15 volts as long as we use the correct value for the current limiting resistors (Rs) which can be calculated with the simple following formula **" Rs = Supply voltage - 1.7 volts divided by current (10 mA) "** .



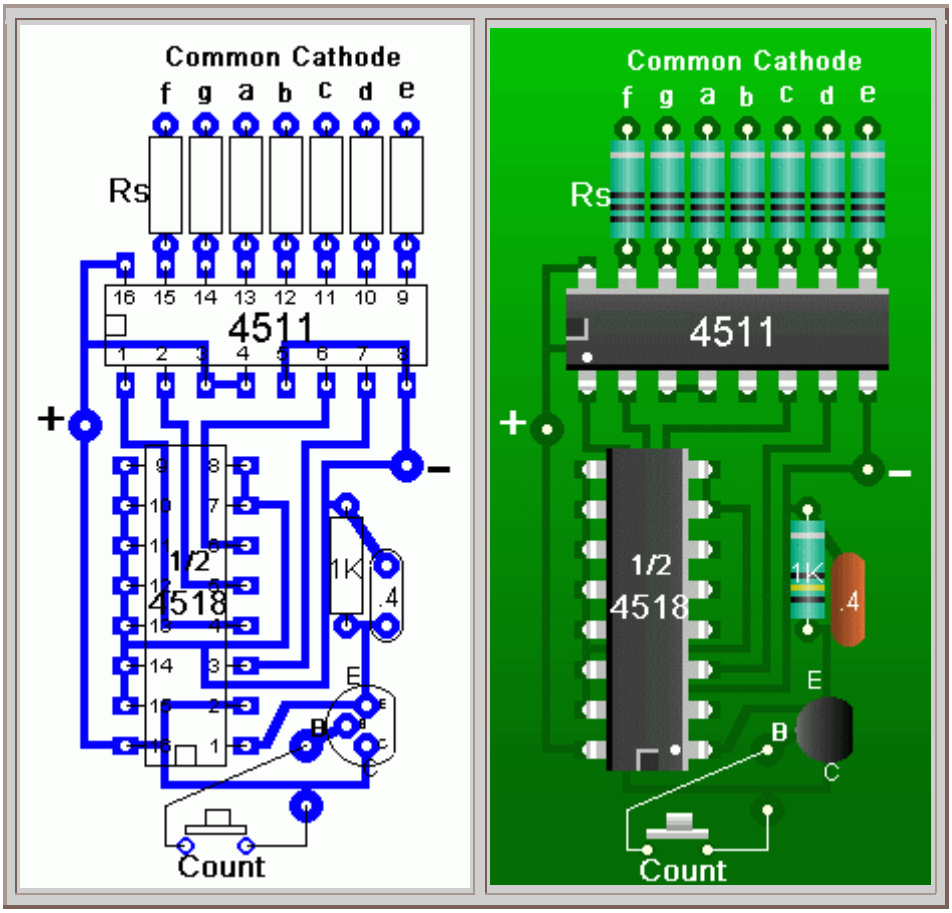
In designing this circuit , I had in mind a design as simple as can possibly be made with minimum readily available components . For the counter a single chip is used , Of the two counters available on the CMOS 4518 only one is used . The LEDs are not multiplexed and each segments must be connected to it own current limiting resistor .
Each segments are single LED which can withstand current of up to 20 mA each but it is recommended that a 10mA maximum current be used to ensure long life with adequate illumination . Thus with an anticipation of all segments when lit showing "8" would amount to a total 7 segments times 10mA would require a total current of 70 mA for the one digit and this should be the minimum supply current plus a 25% for safety for a total of 87.5 mA , so lets say 100 mA power supply at whichever voltage you chose to use from 5 to 15 volts .

Using the Counter

In order to use the counters the following conditions must be set .

- " Enable " pins 2 and 10 must be HIGHT (1)
- " Reset " pins 7 and 15 must be LOW (0)
- " Count " pins 1 and 9 must be HIGH (1)

Normally an IC like a CMOS 40106 is used to debounce the push button switch , I designed a simple Schmitt trigger made of the 2N2222 transistor , the 1K resistor and the .4uF to be used with the counting switch . Most any small signal NPN transistors can be used .
Using a simple push button without the conditioning is not recommended as it will give error counts .See Switch debouncing for alternate circuits that can be used .



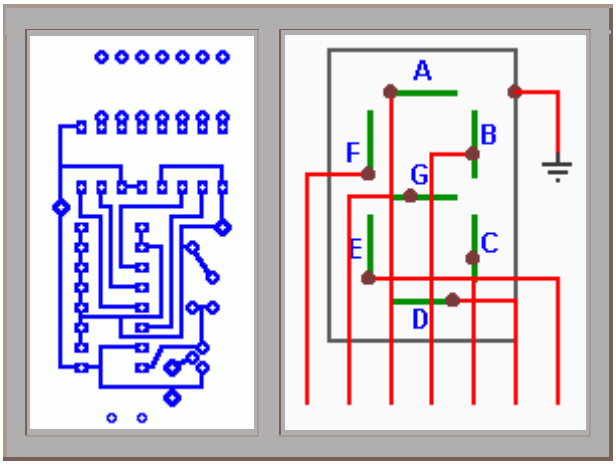
LED Display

The system can accomodate Common Anode (CA) or Common Cathode (CC) LED displays with single LED segments . This circuit uses a Common Cathode Led Display .

Construction

The PCB is actual size and a graphic representation shows how the display is connected to the limiting resistors (Rs) . It is a wise move to used sockets for the ICs . Construction can be made using the PCB layout or hand wired which ever you feel at the moment .
For intermittent operation a 9 volts battery can be used otherwise , several " D " cells in series should be used or a wall transformer type with good rectification can also be used .

If you do not have any experience with this type of project , I would strongly suggest that you start with this one . In order to acquire more knowledge about counters feel free to read the following pages describing in more details more complicated counter projects .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