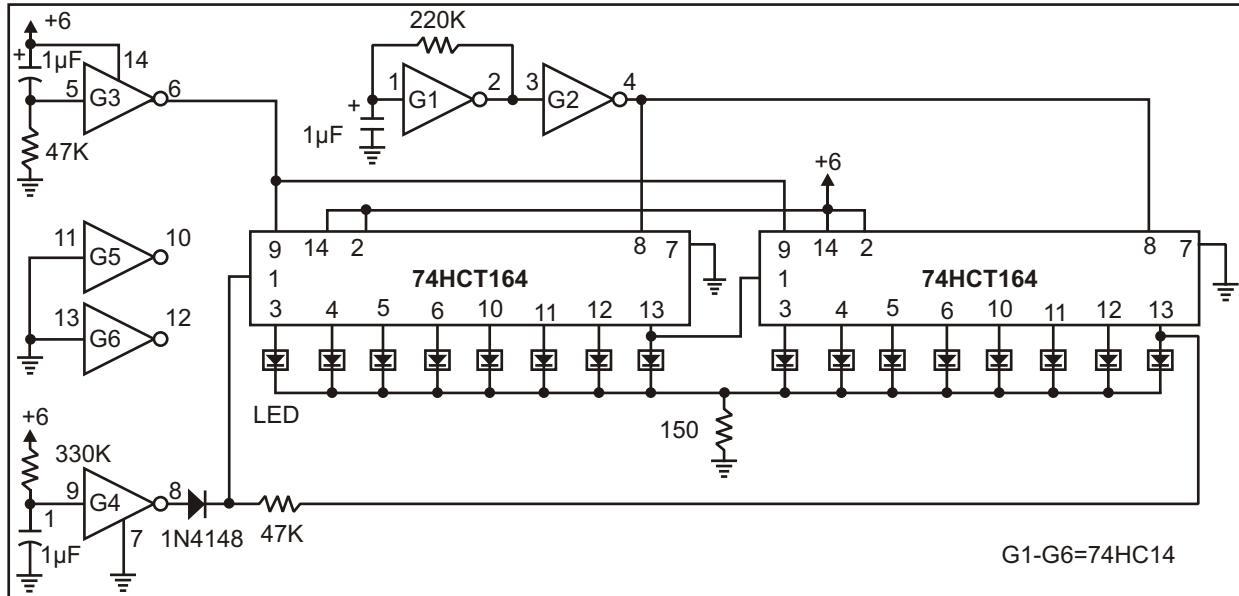# 16 STAGE LED SEQUENCER

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Here is a circuit of 16-stage LED Sequencer which uses a hex Schmitt Trigger inverter (74HC14) and two 8 bit Serial-In/Parallel-Out shift registers (74HCT164 or 74HC164) to sequence 16 LEDs. The circuit can be expanded to greater lengths by cascading additional shift registers and connecting the 8th output (pin 13) to the data input (pin 1) of the succeeding stage. A Schmitt trigger oscillator (74HC14 pin 1 and 2) produces the clock signal for the shift registers, the rate being approximately 1/RC. Two additional Schmitt Trigger stages are used to reset and load the registers when power is turned on. Timing is not critical, however the output at pin 8 of the Schmitt Trigger must remain high during the first LOW to HIGH clock transition at pin 8 of the registers, and must return low before the second rising edge to load a single bit. If the clock rate is increased, the length of the signal at pin 9 of the Schmitt Trigger should be reduced proportionally to avoid loading more than one bit. The HCT devices will normally provide about 4 mA (source or sink) from each output but can supply greater currents (possibly 25 mA) if only one output is loaded. The common 150 ohm resistor restricts the current below 25 mA using a 6 volt power source. If the circuit is operated with two or more LEDs on at the same time, resistors may be needed in series with each LED to avoid exceeding the maximum total output current for each IC of 25 mA. For greater brightness, individual buffer transistors can be used.