16 Stage Bi-Directional LED Sequencer

The bi-directional sequencer uses a 4 bit binary up/down counter (CD4516) and two "1 of 8 line decoders" (74HC138 or 74HCT138) to generate the popular "Night Rider" display. A Schmitt Trigger oscillator provides the clock signal for the counter and the rate can be adjusted with the 500K pot. Two additional Schmitt Trigger inverters are used as a SET/RESET latch to control the counting direction (up or down). Be sure to use the 74HC14 and not the 74HCT14, the 74HCT14 may not work due to the low TTL input trigger level. When the highest count is reached (1111) the low output at pin 7 sets the latch so that the UP/DOWN input to the counter goes low and causes the counter to begin decrementing. When the lowest count is reached (0000) the latch is reset (high) so that the counter will begin incrementing on the next rising clock edge. The three lowest counter bits (Q0, Q1, Q2) are connected to both decoders in parallel and the highest bit Q3 is used to select the appropriate decoder. The circuit can be used to drive 12 volt/25 watt lamps with the addition of two transistors per lamp as shown below in the section below titled "Interfacing 5 volt CMOS to 12 volt loads"