

KX40 DC MOTOR CONTROLLER

BRAKE VOLTAGE:

With PICAXE off => $5V - V_{q2be} = 4.3V$
 - Current through $10k + 4.7k = 4.3 / (14.7k) = 292\mu A$
 - $V_{brake} = 292\mu A * 4.7k = 1.37V + V_{q2be} \sim 2.07V$

Just barely enough to keep BRAKE on and drive LED dimly... or maybe not. It depends on hFE which is stupid design technique. On the other hand, anything more complex becomes stupid elaborate... too much thought for one blinking light.

With PICAXE ON - LOGIC 0:
 - LED OFF, BRAKE OFF

With PICAXE ON - LOGIC 1:
 - LED driven to full on, BRAKE ON

With PICAXE ASLEEP
 - LED mostly on, BRAKE ON

10mA Case:
 $14V - 2V_{drop} = 12V$
 $10mA @ 12V \sim 1200 \text{ ohms}$
 $1/8 \text{ watt min. dissipation in the resistor.}$

20mA Case:
 $14V - 2V_{drop} = 12V$
 $20mA @ 12V \sim 620 \text{ ohms}$
 $1/4 \text{ watt min. dissipation in the resistor.}$

10mA Case:
 $14V - 2V_{drop} = 12V$
 $10mA @ 12V \sim 1200 \text{ ohms}$
 Two resistors in series split the voltage drop task. Two resistors 600 ohm each with $\sim 6V @ 10mA$ result in 60 milli-watts min. dissipation in each resistor.

20mA Case:
 $14V - 2V_{drop} = 12V$
 $20mA @ 12V \sim 600 \text{ ohms}$
 Two resistors in series split the voltage drop task. Two resistors 300 ohm each with $\sim 6V @ 20mA$ result in 1/8 watt min. dissipation in each resistor.

