

**DC MOTOR SPEED CONTROL 20W**  
CODE 804 **LEVEL 1**

The DC motor speed control circuit is used to control the speed of direct current. The volume is available for adjustment of speed since stopping to fastest.

**Technical specifications:**

- power supply : 12VDC.
- load voltage : 12VDC. / 1.5A. max.
- output : controlled DC motor by PWM.
- PCB dimensions : 1.76x1.32 inches.

**How to works:**

IC1 oscillates the frequency at 264Hz related to R1, R2, R3, VR1 and C1. VR1 is available for the adjustment of duty. If the plus duty is more than the minus duty, this result the motor to slow down. The frequency will be transmitted through the pin 3 of IC passed on R4 to the base of TR1. Therefore, TR1 function as adjustment of VR1 manner.

$$\text{FREQUENCY} = \frac{1}{T1+T2}$$

$$T1 = 0.693 (R1+R2)C1$$

$$= 0.693 (10K+5K) \times 0.01$$

$$= 103.95 \text{ Hz}$$

$$T2 = 0.693 (VR1+R3)C1$$

$$= 0.693 (500K+30K) \times 0.01$$

$$= 3,762.90 \text{ Hz}$$

$$\text{FREQUENCY} = \frac{1}{3,776.85} \times 1,000,000$$

$$= 264.7709 \text{ Hz}$$

**PCB assembly:**

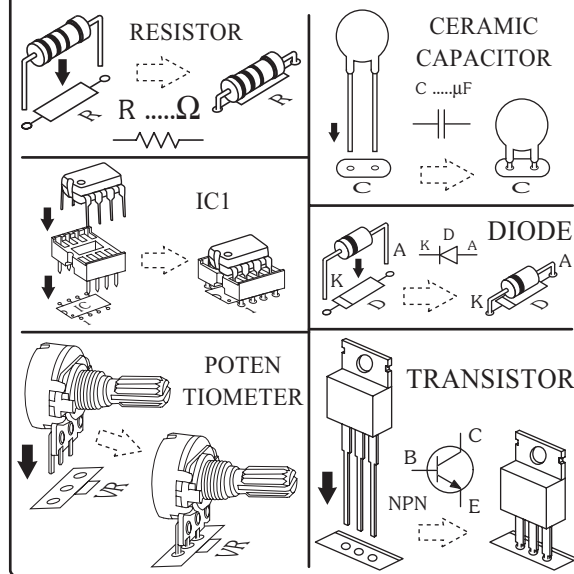
Shown in Figure 3 is the assembled PCB. Starting with the lowest height components first, taking care not to short any tracks or touch the edge connector with solder. Some tracks run under components, and care should be taken not to short out these tracks. All

components with axial leads should be carefully bent to fit the position on the PCB and then soldered into place. Make sure that the electrolytic capacitors are inserted the correct way around. The LED has a flat spot on the body which lines up with the line on the overlay. Now check that you really did mount them all the right way round!

**Testing:**

Connect motor 12VDC to the "OUT" terminal. The power supply must be connect pole correctly, the anode at "+12V" point and cathode at "G" point. Then adjust the volume to the left resulting the motor to slow down and the right resulting the motor to be faster. The ventilated board should be provide if the circuit is used to more 800mA. The maximum current is 1.5A.

**Figure 1. Installing the componants**



**Troubleshooting:**

The most problem like the fault soldering. Check all the soldering joint suspicious. If you discover the short track or the short soldering joint, re-solder at that point and check other the soldering joint. Check the position of all component on the PCB. See that there are no components missing or inserted in the wrong places. Make sure that all the polarised components have been soldered the right way round.

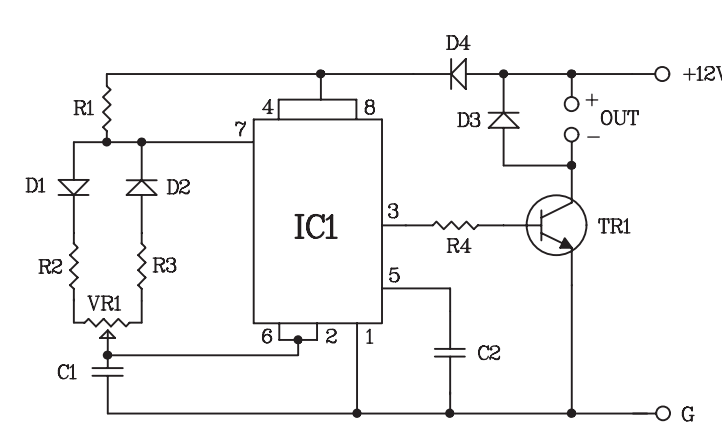
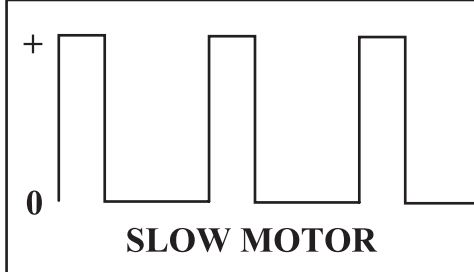
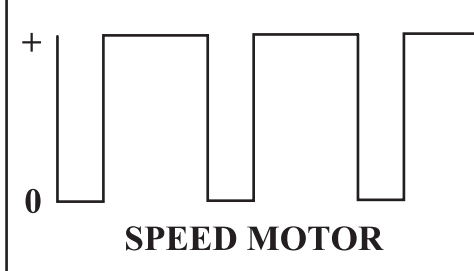
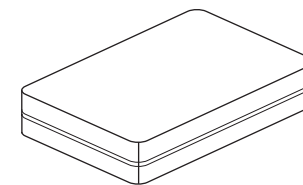
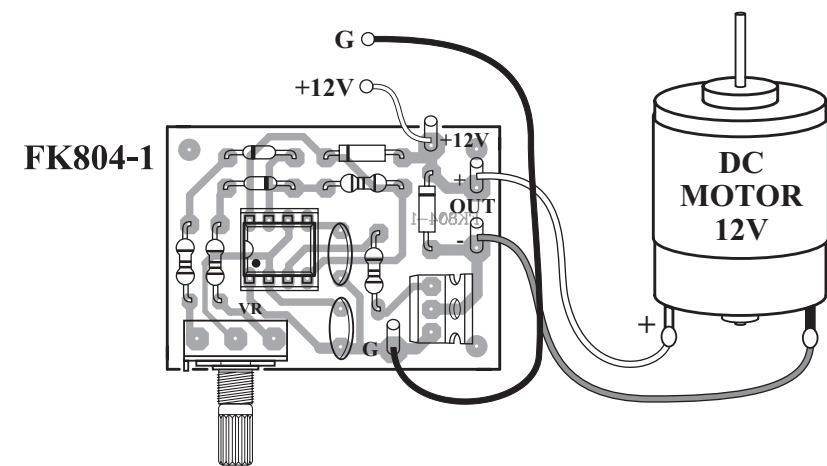


Figure 2. The DC motor speed control circuit



**Figure 3. Connections**



**NOTE:**  
FUTURE BOX FB20 is suitable for this kit.

NEW KIT SET

CODE FK	DESCRIPTION	POWER
168	NO SMOKING FLASHER 46 LED	9-12VDC
170	DANGER FLASHER 42 LED	9-12VDC
172	THREE STEP FLASHER 19 LED	9-12VDC