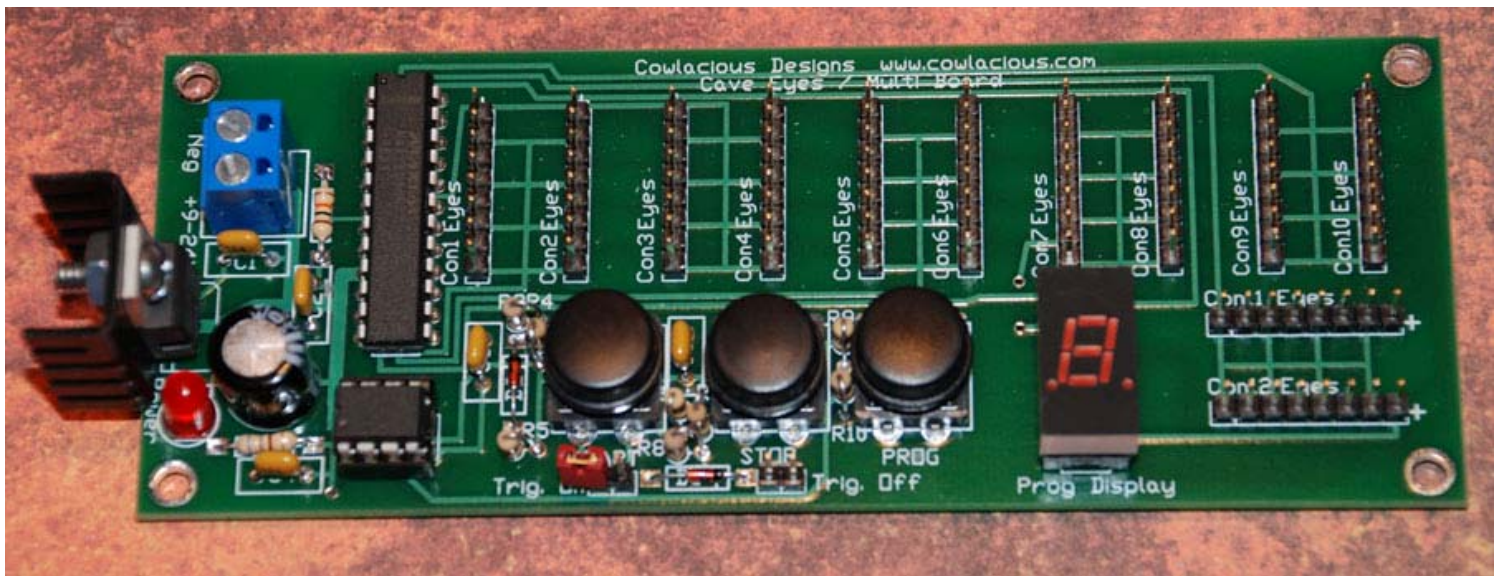


Cave Eyes Kit

2007



Cowlacious Designs™
By Computer & Electronic Services

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Introduction:

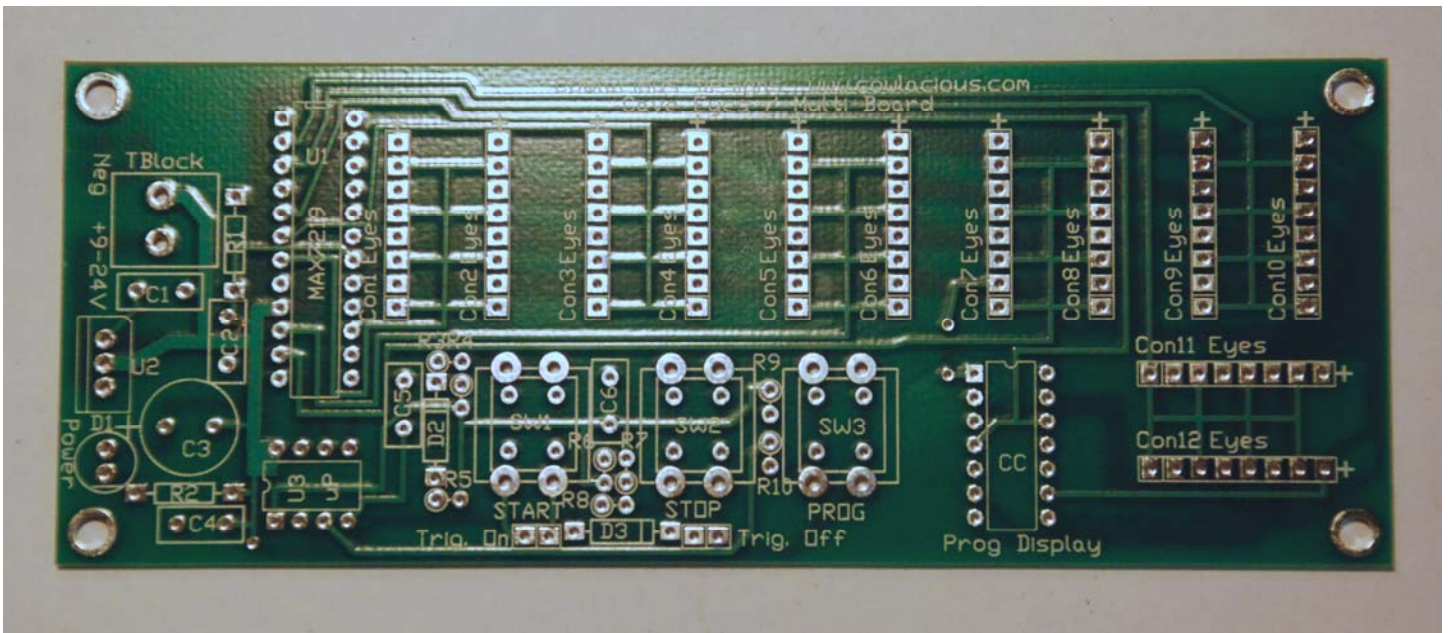
- Cave Eyes are designed to imitate the eyes of bats or other creepy crawly creatures that blink on and off in the darkness. They can also be used to replicate the flashing lights of high tech equipment. They can be used anywhere where you need flashing pairs of LEDs.
- Cave Eyes are used in conjunction with the Cave Eye LED harnesses (sold separately). At least one harness is required (up to a maximum of 12 harnesses) for the Cave Eyes to work.
- Cave Eyes now have multiple LED flashing sequence programs.
- The speed of the LEDs flashing of all programs is now adjustable.
- The brightness of the LEDs in all program modes is now adjustable.

Parts list for Cave

Eyes:

1	RES-680-25	1 K ohm 1/4W resistor	R2
4	RES-10K-25	10 K ohm 1/4W resistor	R1(h), R5, R6, R9
1	IC-MAX7219	MAX7219	(v)
	CAPD-0.1UF-		MAX7219
4	50V/5.1LS	Ceramic Disc Cap, 0.1uF	C1, C2, C4, C5, C6
1	DIP-8-03	8 Pin Dip	U3
1	DIP-14-03	14 Pin Dip	CC
	SWITCH-KRS-	Switch - Push Button,	
3	1273B	Momentary, PCB mount	SW1, SW2, SW3
2	RES-330-25	330 ohm 1/4W resistor	R4, R7 (v)
3	RES-1.2K-25	1.2K ohm 1/4W resistor	R3, R8, R10 (v)
2	HDR-2	Header - 2 pin	Trig On, Trig Off
12	HDR-8	Header - 8 pin	Con1-Con12
1	LED-RED-5MM	LED - Red	D1
	TERMINAL		
1	BLOCK-2V	2 terminal block	TBlock
		Electrolytic Cap Radial, 330	
1	CAPR-330-35V	uF, 35V	C3
		DISPLAY,7-	
1	DSP-7SEG-RED	SEG,CC,RED,1DGT	U3
1	IC-PIC12F683	PIC12F683	CC
	SWITCH-KRS-		
3	CAP-B	Switch Cap	SW1, SW2, SW3
1	IC-7805	7805 Voltage Regulator	U2
	Heatsink TO-220		
1	case style	Heat Sink	
1	#6 screw, 1/2"	Screw	
1	#6 nut	Nut	
1	Red Shorting Cap	Red Shorting Cap	Trig On
2	Trigger cable	Trigger Cable	Trig On, Trig Off

Construction



- Remove the components from the packaging and check to make sure that all of the parts are there.
- Look at the circuit board and identify the component side of the board. This is the side with the white silk screen for the components. The outlines for the components are marked C1, CC, U2, etc. This is the side of the board that parts will be placed on. **DO NOT SOLDER ON THIS SIDE OF THE BOARD.** Solder in place by soldering the leads on the opposite side of the board.
- Install Small Signal Diode D2, and D3. Solder them in place and trim leads.
- Install resistors R2. Solder it in place and trim leads.
- Install resistors R1. Solder it in place and trim leads.
- Install the chip I.C.: IC-MAX7219. **Make sure the notch on the chip is facing the same way as shown on the silkscreen of the circuit board.** Solder in place.
- Install the 0.1uF ceramic disc capacitors C1, C2, C4, C5, & C6. Solder in place and trim the leads.
- Install the 8 pin socket for the IC-PIC12F683 chip and solder in place. **Make sure the notch on the socket is facing the same way as shown on the silkscreen of the circuit board. Do NOT solder the**

IC-PIC12F683 chip onto the board or you won't be able to program it – only solder the socket for the IC-PIC12F683 onto the board.

- Install the 14 pin socket for the DSP-7SEG-RED display chip and solder in place. **Make sure the notch on the socket is facing the same way as shown on the silkscreen of the circuit board. Do NOT solder the DSP-7SEG-RED display chip onto the board only solder the socket for the DSP-7SEG-RED display chip onto the board.**

- Install R4, and R7 in their respective places. PLEASE NOTE: These resistors stand up on their end, so the resistor leads must be bent as shown below.



- Install R3, R8, and R10 in their respective places. PLEASE NOTE: These resistors stand up on their end, so the resistor leads must be bent as shown below.

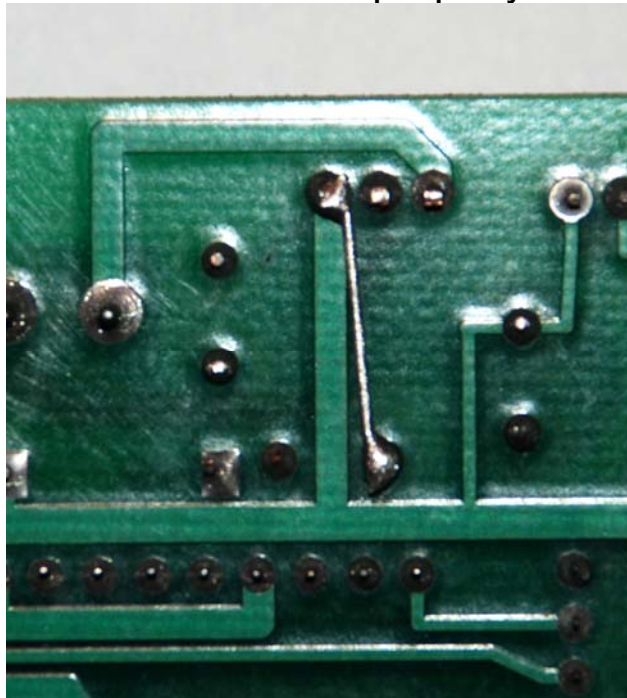
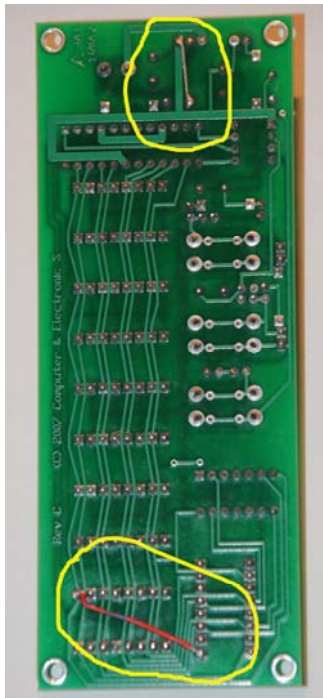


- Install R5, R6, and R9 in their respective places. PLEASE NOTE: These resistors stand up on their end, so the resistor leads must be bent as shown below.

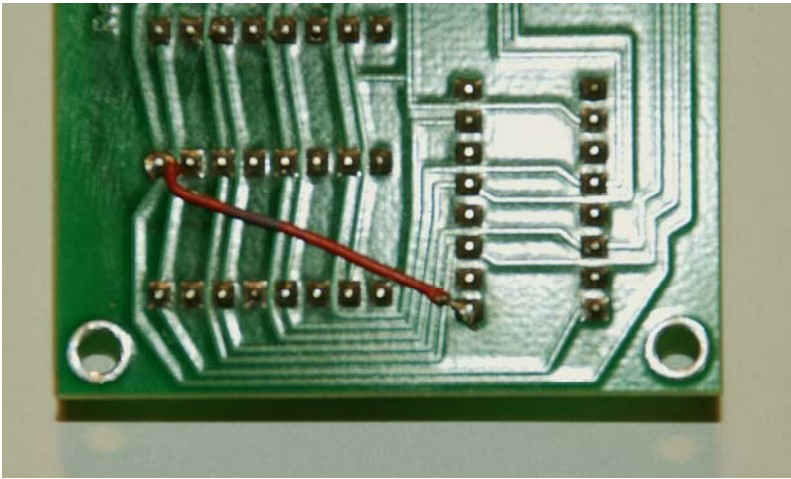


- Install a 2-pin header in the “Trig On” location. Solder in place.
- Install a 2-pin header in the “Trig Off” location. Solder in place.
- Install SW1, SW2 and SW3. Solder in place.
- Install the 8-pin headers in Con1 Eyes through Con12 Eyes (a total of 12 8-pin headers). Solder in place.

- Install the Red LED (D1) in place with the positive side of LED facing toward U2 on the circuit board. The positive side of the led is the side with the longer lead.
- Install the terminal block in location TBlock. Solder in place.
- Install electrolytic capacitors C3 (330uF). Solder in place and trim the leads. **Make sure to orient the capacitors positive and negative leads correctly. The negative side is marked with an arrow down the side of the capacitor. The positive side is marked on the circuit board.**
- Install the 7805 voltage regulator into location U2. Solder in place and trim the leads. Note: The front of U2 faces toward C2 and the back faces away from the circuit board.
- Because of a small circuit board design error, you may have noticed that a trace had been cut on the top side of the board below C2. This was necessary to fix the problem. Turn the board over so that you are looking at the bottom of the board take a piece of wire, like a small piece of resistor lead that you have cut off, and tack solder it from the ground pin of the 7805 voltage regulator to the right pin of C2. That creates the fix for the trace that was not routed properly.



- To have a signal to Con11 Eyes you will need to run a piece of insulated wire from the + pin of Con9 Eyes to the + pin of Con11 Eyes.



- Install the push button cap on SW1, SW2, and SW3 by pressing it into place on the push button stem.
- Install the heat sink onto the 7805 voltage regulator using the #6 screw and nut. The fins of the heatsink should face away from the circuit board.
- Plug the 7-SEG DISPLAY into the 14 pin socket with the 2 dots, at the base of the 8, closest to the edge of the board.
- Plug the IC-PIC12F683 into the 8 pin socket on the board. **Make sure the notch on the chip is facing the same way as the notch on the socket.**
- Carefully check your soldering job to make sure all the connections are soldered and to make sure that no solder bridges have occurred that would connect items that shouldn't be connected.
- Congratulations, it is now time to test and adjust the circuit.



Testing and Adjustment

(Note: Please see connection diagrams on the following pages.)

- Supply power to the board by connecting a 9 to 24VDC power supply to the power terminal block. (Make sure that the positive contact is connected to the marked positive pole of the terminal block.) You should see the “Power” LED light up and a number should appear on the display as soon as power is applied.
- Push the “prog” button (SW3) until program number 5 appears on the display.
- With power applied and number 5 on the display, plug a cave eye harness into “Con1 eyes”. (Make sure the positive lead on the harness is aligned to the positive contact on the “Con1 eyes” header pin. The one closest to the edge of the board.) With the harness connected, press the start button (SW1). The LEDs of the harness should repeatedly all go on and then off.
- Repeat this operation with “Con2 eyes” through “Con12 eyes” header pins.

Operations:

- Connect your Cave Eye harness(es) to the 8 pin header(s). Make sure you properly orient your harness(es) with the header(s). The header is marked with “+”, orient the brown wire on the harness to the “+”.
- Make sure the red header shorting cap is removed from the “trig on” header before applying power.
- Supply power to the board by connecting a 9 to 24VDC power supply to the terminal power block with the negative wire going to the “neg” connector. (the power block is marked with “neg” and “+9-24V”) 9 volts is recommended. A 24VDC supply may require a larger heatsink to be put on the voltage regulator depending on the operation time of the Cave Eyes.
- You should see the “Power” LED light up and a number appear on the display as soon as power is applied,.
- The number indicates the program mode.
- With the program off you, can change the program mode by pushing the “prog” button. Once the desired program mode is reached, press the “start” button to start the program.
- To stop a running program, press the “stop” button.

Programming:

Cave Eyes have three programming buttons: the “start” button, the “stop” button, and the “prog” (program) button.

The “start” button turns on the program.

The “stop” button turns off the program.

The “prog” button allows you to change between the different programs. (To change programs you must be in the off mode.)

Program 1: Regular blinking eye program.

Program 2: Slow wake up (as if the creatures were randomly just waking up) which then proceeds into the regular blinking eye program.

Program 3: Alternative slow wake up which proceeds into the regular blinking eye program.

Program 4: All LEDs repeatedly fade to bright and then fade to dim.

Program 5: All LEDs repeatedly flash on then flash off.

Program 6: Used to set LED brightness.

To set brightness, press the “start” button. Press and hold the “prog” button until the right dot at the base of the number comes on. With the “prog” button depressed and the right dot on, pressing the “start” button increases the brightness (numbers 1 to 9 with 1 being the dimmest and 9 being the brightest) and pressing the “stop” button decreases the LED brightness. (The change of brightness of the LEDs does not show until you release the “prog” button.)

To program LED speed: In programs 1 thru 5, press the “start” button to start the program. While the program is running, press and hold the “prog” button until the right dot at the base of the number comes on. With the “prog” button depressed and the right dot on, the “start” button increases the program speed (numbers 1 to 9 with 1 being the slowest and 9 being the fastest) and the “stop” button decreases the program speed. Once the desired speed is reached, release the “prog” button. You will have to press the “start” button to start the program at the new speed.

SUPPLIED OPTIONAL DEVICES

- Red shorting cap goes onto the “Trig. On” header pins (if auto on is desired).
- TRIGGER WIRES - Two sets of trigger wires are provided for your convenience. The trigger wires allow you to easily trigger the device using an effect timer, step pad, motion detector, switch, etc. Just remove the RED jumper that is attached to the trigger pins and replace it with the trigger wires plug. Then connect the trigger wires to your triggering device. The triggering device should provide a set of dry contacts that do not send any voltage to Cave Eyes triggering pins.

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