

# ASSEMBLY INSTRUCTIONS FOR NEW FK109 2 LED FLASHER KIT WITH ADJUSTABLE FLASHING SPEED CONTROL

Description: Very easy to build, The FK109 Led Flasher kit makes the perfect alternating led flasher for an attention getting display, a dummy burglar alarm display. or on model railroads as an warning flasher or crossing flasher. Operates on 3 – 12 volts DC with best results from 6 – 9 volts DC. Current draw is a very low 10-20 milliamps



The kit builder must supply the following  
Tools and Materials which are NOT Included in the kit

1. Soldering Iron
2. Side cutters or flush cutters to trim components leads
3. Wire to remotely connect the leds to the circuit board (for Model RR use)
4. a small slotted screwdriver to adjust the speed control pot

Component Inventory:

The following parts are in the carded kit container:

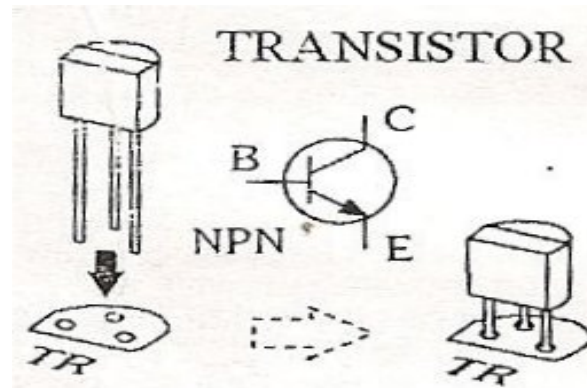
- 2 - 3K3 ohm Resistors (3,300 ohm) (orange –orange – red – gold)
- 2 – 470 ohm Resistors (yellow – violet - brown - gold)
- 2 – 33uf Capacitors
- 2 – Transistors
- 2 – 5mm leds (not used for Model Railroad Applications)
- 1 – Circuit Board
- 1 – 10k Ohm Potentiometer (or pot) (for speed adjustment)
- 1 – roll of solder
- 1 – red and black wires for power input
- 2 – copper pegs for soldering power wires too ( optional as you can solder wires directly to board if you wish



Step 1: place and solder in place the 4 resistors in the locations marked, then clip the excess leads flush to the underside of the circuit board - **check the colors of the resistors in the picture below to make sure to put the right resistors in the proper locations**

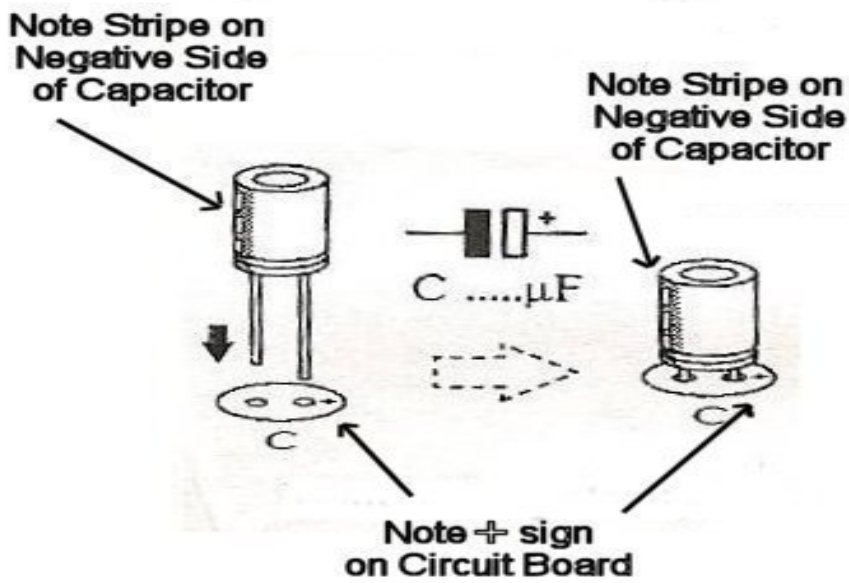


Step 2: place and solder in place the two transistors using the outlines on the circuit board as a guide, so you don't install them backwards, again clip the excess leads flush to the underside of the circuit board

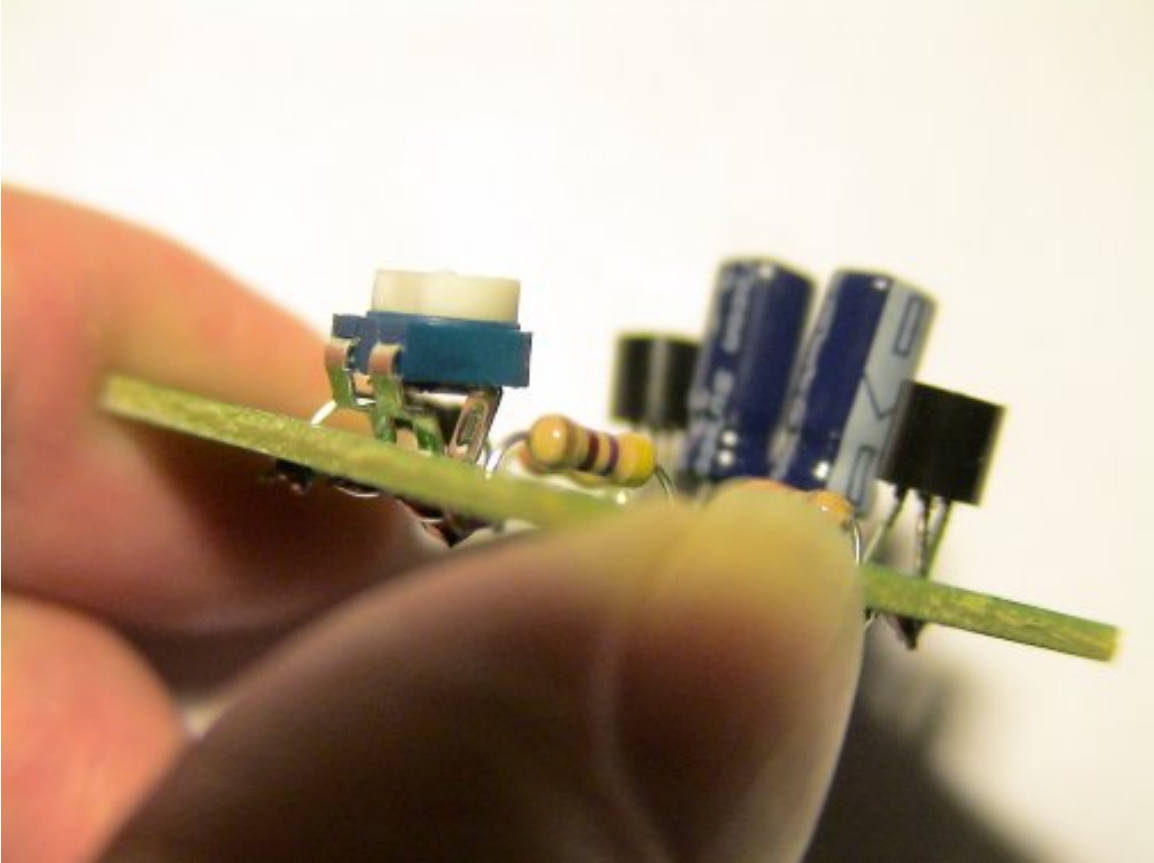


Step 3: place and solder the two electrolytic capacitors in place, making sure to match the polarity to that marked on the circuit board – the negative side of the capacitors has a white stripe - again clip the excess leads flush to the underside of the circuit board

## Electrolytic Capacitor Orientation



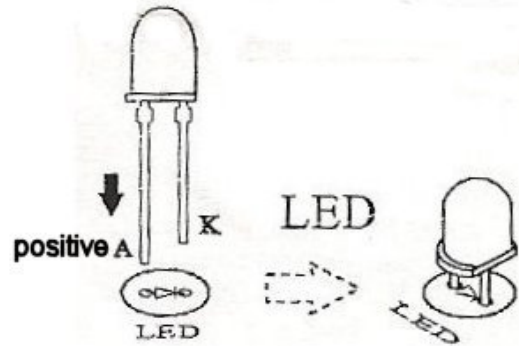
Step 4: place and solder the 10k ohm potentiometer in place  
You may have to bend the legs of the potentiometer to fit to holes in the circuit board



Step 5: For other than model railroad applications, you can simply insert and solder the supplied 5mm leds in their respective holes on the circuit board...

### Led Orientation

Long led of leds is positive  
A for anode is positive side



Step 6: insert and solder in place your power input wires making sure to use red wire for the (positive +) and black wire for ground (negative - )



Step 7: apply power – minimum 3 volts DC – Maximum 12 volts DC – Best Results are obtained at 6-9 volts DC

The leds should start alternating flashing back and forth - try adjusting the 10k pot - flashing speed will vary accordingly. – you will need a small slotted screwdriver to fit in the slot on the top of the 10k ohm potentiometer

### TROUBLESHOOTING:

As the circuit has only a few components, the main trouble comes from misplacing components, or faulty solder joints. If the circuit does not work:

1. check the component placement making sure you have the right parts in the right place, making sure the transistors and capacitors are installed properly, not installed backwards
2. then check all the solder points to make sure they are not loose, or that solder has spilled over on another solder pad causing a short
3. check the wiring to the leds to make sure the leds are not wired backwards – remember, the long leg of the led is the positive side

