

ASSEMBLY INSTRUCTIONS FOR NEW FK109
4 LED Railroad Crossing Flasher Kit
WITH ADJUSTABLE FLASHING SPEED CONTROL
with 4 Red 3mm Leds



Description: Very easy to build, The FK109 Led Flasher kit makes the perfect alternating led flasher for modeling the flashing lights at railroad crossings. 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)



For Model Railroader applications

The following parts are in a separate clear plastic bag:

4 – 3mm Red Diffused Leds

2 – 33k ohm resistors to use in place of the 3300 ohm resistors to slow the flash rate down so it is more appropriate for Model Railroad use

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 - make sure to put the right resistors in the proper locations



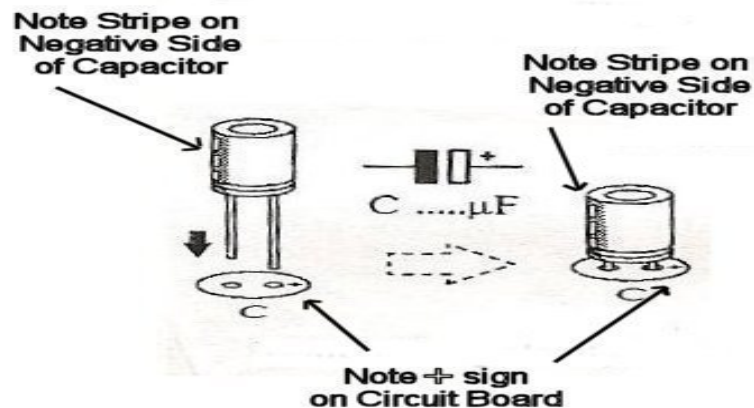
Step 2: place and solder in place the two transistors using the outlines on the circuit board as a guide, so you don't install them backwards, again clip the excess leads flush to the underside of the circuit board – **don't try and spread the transistor legs to far apart or try and shove them down too far into the board as this can damage the transistors – better to leave them standing up a little higher on the 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

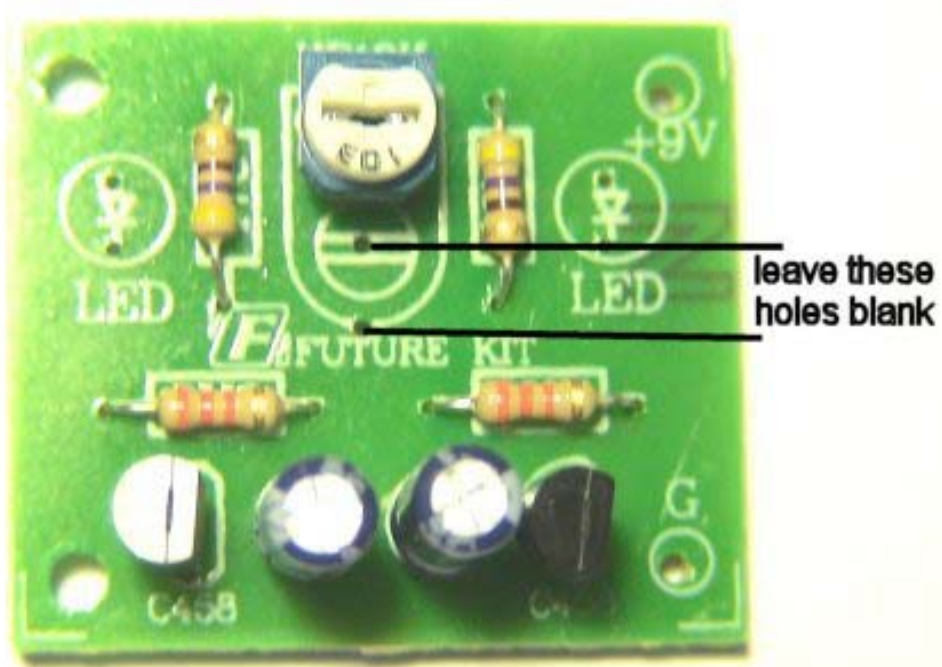
Note long leg of capacitor goes in hole marked with the + sign

Electrolytic Capacitor Orientation





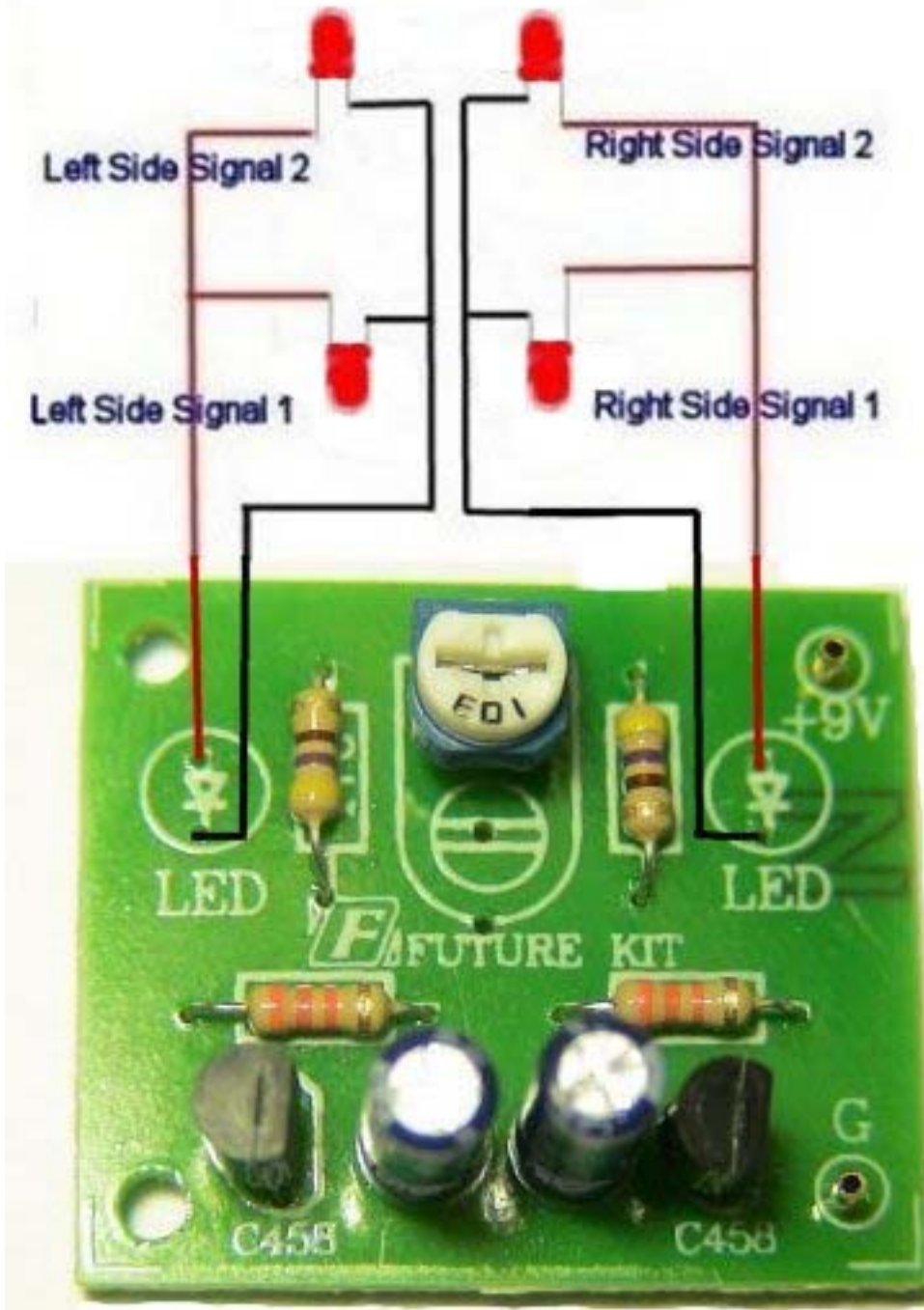
Step 4: place and solder the 10k ohm potentiometer in place
You will need to slightly bend the legs of the potentiometer to make it fit in the holes on the circuit board. **NOTE: the two holes in back of the potentiometer are not used and don't need to be soldered**



STEP 5

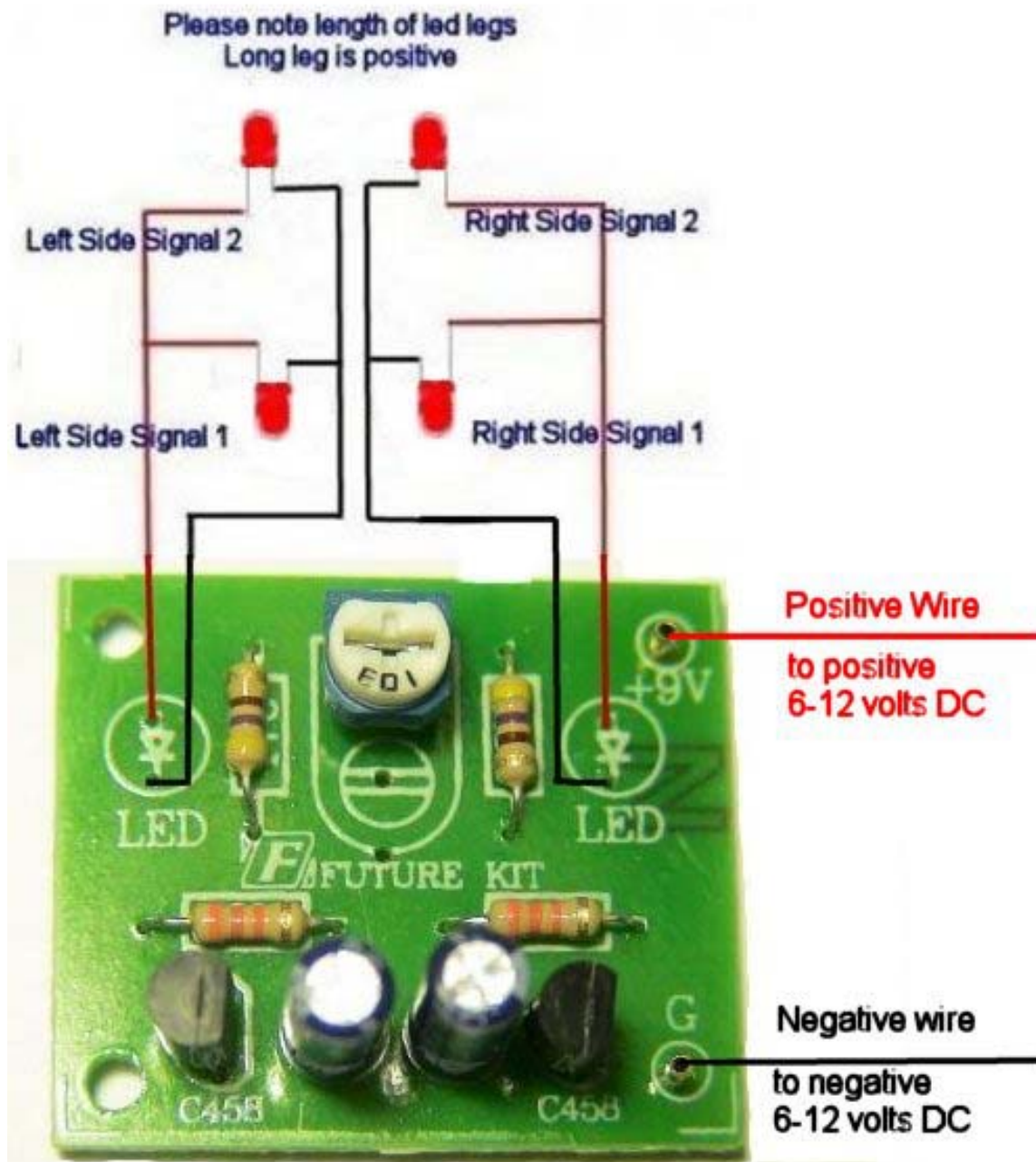
for Model Railroad flashers with remotely mounted leds - insert color coded wires (not included) into the holes on the circuit board marked for leds follow the wiring diagram as shown below to connect the 4 red 3mm leds supplied in the separate bag

Please note length of led legs
Long leg is positive



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)

If you want you can insert the 2 copper posts in the Positive and negative power source holes or simply insert the wires into the board as shown



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.

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
4. if only one of the led lights, check and see that the led that does not light isn't wired backwards...try reversing the leads