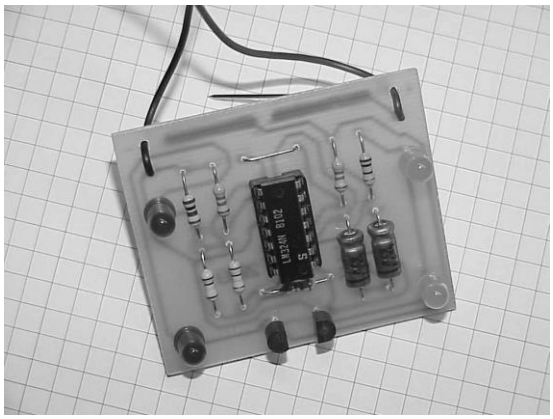
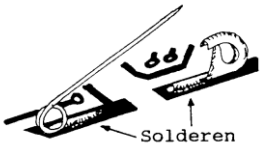
DE WARP SPEED 2003

Starship Enterprise cruises space waiting for a new adventure. A signal from a far away galaxy. Captain Picard orders "Warp Speed !". The Warp Speed warning lights are switched on. The Starship Enterprise moves through space and time to it's new destination.

You can build this Warp Speed flash light, that slowly extinguish while the time flies by.



REQUIRED COMPONENTS:
R1,2,3 = 47k (yellow – purple – orange)
R4,5 = 100k (brown – black – yellow)
R6,7 = 100 (brown – black - brown)
C1,2 = electrolytic capacitor 4,7µF/64V
D1,2 = LED, 5mm, red
D3,4 = LED, 5mm, green
T1 = BC547
T2 = BC557
IC1 = LM324
1 x 14 pins IC-socket
1 x 9V battery clip (red:+ and black :-)
1 x jumper (piece of rest wire)
1 x safety pin
1 x printed circuit board (PCB)
1 x piece of solder (not supplied)
1 x 9V battery (not supplied)



TECHNISCHE BOUWBESCHRIJVING:

Start with the lowest components: resistors R1 - R7. Look on the white print on the PCB what the correct locations are. Please notice that there are 3 different kind of resistors which can be distinguished by their colored rings.

Next are capacitors C1 en C2. Also for the position of these components please check the PCB. The capacitors have a PLUS and a MINUS, have a close look at the notch.

The black IC socket is next. The socket has a notch on 1 side, which is also printed on the PCB. Please make sure that all pins are fitted properly in the holes before you start soldering.

The transistors T1 and T2 the next components. T1 and T2 are not equal. Read carefully the type number on the casing!

The LED's (lights) are the next components. The LED's have a long and a short wire. The short wire needs to go near the "K" on the PCB. If you fail to do so, the project will not work!

De LED

You cut of the excess wires from the resistors. Take a piece and make a jumper. The jumper is located a bit higher than the IC socket.

The 9 Volt battery clip is the next component. Check the drawing for the location of the red (+) and black (-) wire. Don't mix up, because the project will not work. The battery clip wires enter through the larger outside holes in the PCB. This way the wire will not break easily during usage.

The last part to solder is the safety pin. Check the detail drawing. The pin can be used to wear your Twister on your shirt. The pin also acts as an ON-OFF switch. The pin needs to cut in half using some heavy pliers. Make sure you cut the right leg (not the leg with the needle). Solder the both halfs of the pin on the large copper surfaces on the PCB. Keep an eye on the distance and make sure the pin can still be closed.

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Finally you take the IC from the protective packaging and put it in the socket. The notch on the IC has to point to the bottom. Press well.

That was it!

Connect the battery to the clip, close the safety pin, and … does your Warp Speed work ?

HET SCHEMA