

P73

MULTI-FLASHER

Alternate single/double flash



This microcomputer-driven flasher can produce double-flash alternate bulbs or single flash alternate bulbs. You can, of course, fit only one bulb to get the double or single flashing action if you wish. It requires a 6V to 12V power source. The rate at which the unit pulses can be varied by the on-board adjuster. The maximum bulb current from each output is 1/4 Amp (250mA), this equates to three Grain Of Wheat bulbs on each output; six bulbs in all. Modern police/fire/emergency vehicles use the double flash mode.

MICROCOMPUTER & MOSFET TRANSISTOR DESIGN

- Functions
- 1.
 - 2.
 - 3.
 - 4.

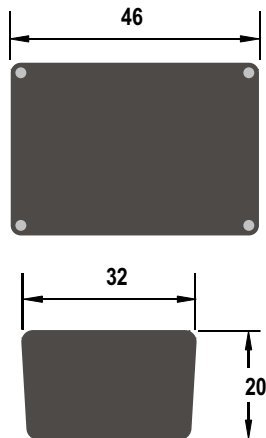
- Alternate double flash
- Alternate single flash
- One light double flash
- One light single flash
- Adjustable VR1
- 6 volts to 12 volts
- To match working volts
- 250ma (1/4 amp)

Flash rate

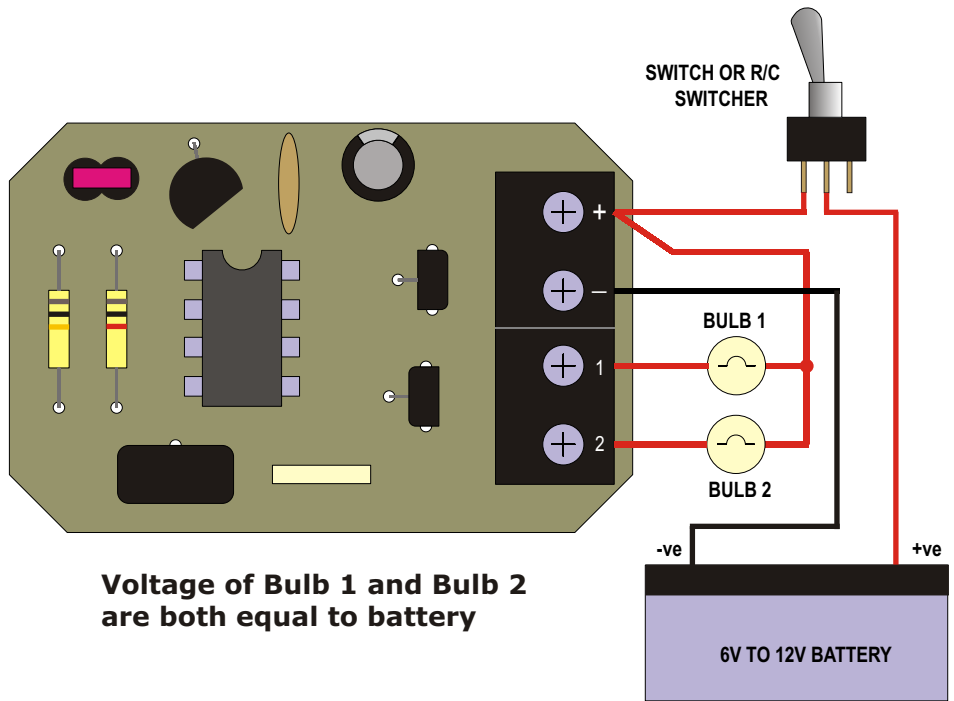
Working voltage range

Bulb volts

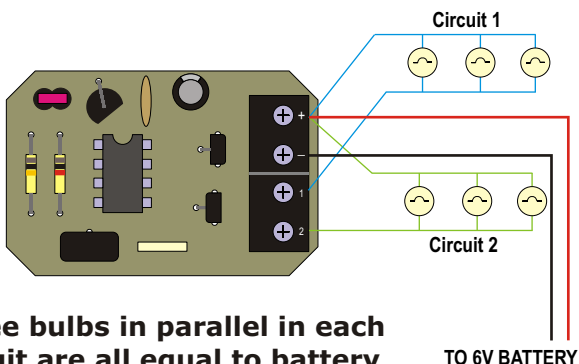
Maximum current rating (per output)



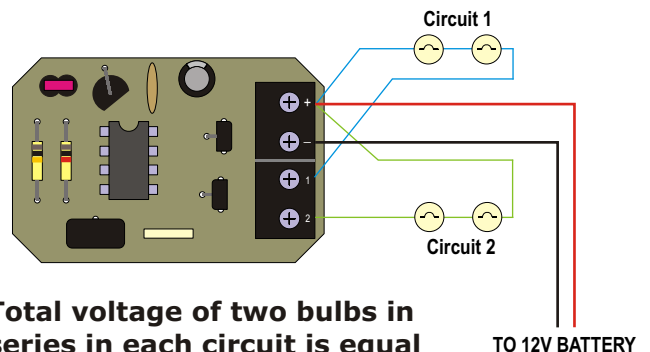
Case Dimensions



Voltage of Bulb 1 and Bulb 2 are both equal to battery



Three bulbs in parallel in each circuit are all equal to battery voltage e.g. All are 6v bulbs if battery is 6v



Total voltage of two bulbs in series in each circuit is equal to battery voltage e.g. All are 6v bulbs if battery is 12v

P73

MULTI-FLASHER
Alternate single/double flash



This microcomputer-driven flasher can produce double-flash alternate bulbs or single flash alternate bulbs. You can, of course, fit only one bulb to get the double or single flashing action if you wish. It requires a 6V to 12V power source. The rate at which the unit pulses can be varied by the on-board adjuster. The maximum bulb current from each output is 1/4 Amp (250mA), this equates to three Grain Of Wheat bulbs on each output; six bulbs in all. Modern police/fire/emergency vehicles use the double flash mode.

Flash rate	Adjustable VR1
Working voltage range	6 volts to 12 volts
Bulb volts	To match working volts
Maximum current rating (per output)	250mA (1/4 amp)
Case size	46mm x 32mm x 20mm

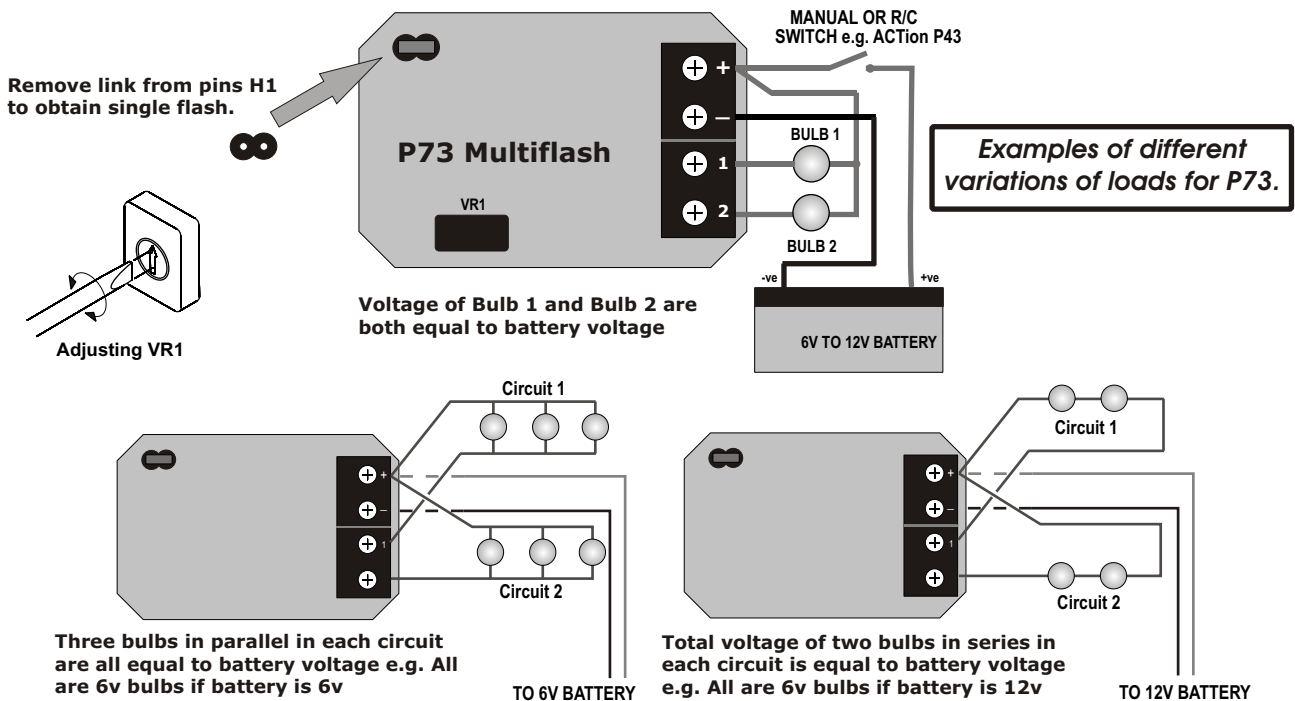
SETTING UP AND INSTALLATION

Connect bulbs as shown on the wiring diagram. Note that one wire of each bulb goes to the Positive + power terminal and the other wire goes to the outputs 1 & 2. Take care to get the polarity correct or you will fatally damage the unit. Fit the small link over pins H1 to obtain a double flash, and remove it for a single flash. The unit will flash the two outputs alternately. If you only want to have one flashing bulb (or set of bulbs) then just use one output. Adjust the flash rate using a fine screwdriver in the slot of trimmer VR1. Drill suitable holes in the ABS case to enable the wires to reach the screw terminal connector blocks without kinks, and use Velcro pads to secure the case to the inside of the model.

RECOVERY SERVICE

A recovery or repairs service ensures that you will not be left with a dead unit for any reason. The Service Charge for this kit is £13.00 including parts (including return shipping cost IN UK). All returns should include full Credit Card details (Name & Address of cardholder, Card Number, Expiry Date and Card Security Number)

ACTION R/C ELECTRONICS, 1 Llwyn Bleddyn, Llanllechid, Bangor LL57 3EF, United Kingdom

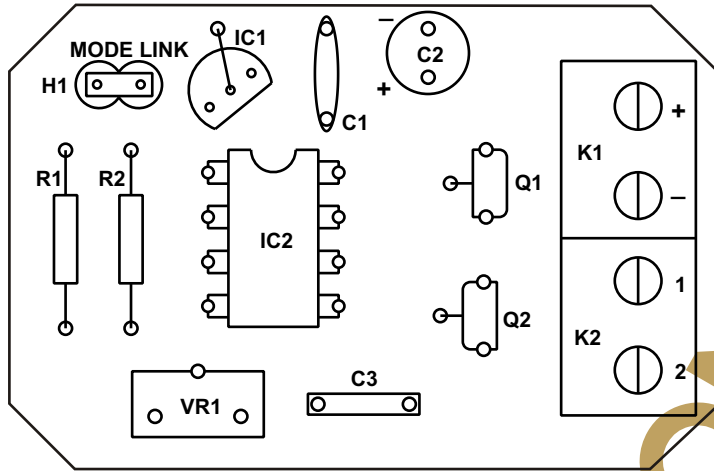


Units are polarity-critical! Take care to connect the battery correctly!

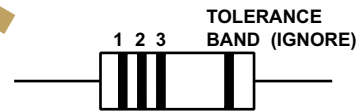
The small print.....
 ACTION R/C Electronics guarantee all products to be free from manufacturing defects for 12 months from date of purchase. This does not cover suitability for specific applications; components worn or damaged by use, tampering or incorrect connection; alteration to original components; damage to batteries or other equipment through use; misuse, or shipping damage. Where goods are found to be faulty, the customer shall return them to ACTION R/C Electronics in their original condition and with their original instructions, packaging etc. Our liability is limited to repairing or replacing goods to their original specification and will not exceed the cost of the goods. By using the product the user accepts all liability. Where a fixed repair charge is applicable, ACTION R/C Electronics shall undertake repairs to the extent that they are judged economically viable. Where such is not the case then the customer will be offered the option of crediting the repair charge towards the cost of a new unit or having the faulty unit returned and the charge refunded (less the cost of return carriage). We reserve the right to modify this guarantee without notice.



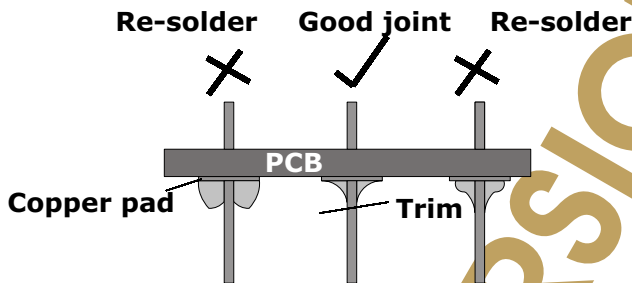
P73 MULTI FLASHER UNIT
Instructions for Kit version



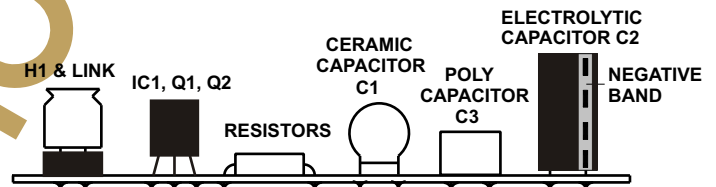
Component Layout



Resistor colour bands



Soldering Tips



Component mounting details

PARTS LIST

- IC1 5V low-dropout regulator (various numbers from different manufacturers)
- IC2 PIC12C508/04 (programmed) IC + 8 PIN IC socket (see notes on handling)
- Q1,2 MOSFET transistors (marked ZN2106A)
- R1 100K ohm resistor 1/4 WATT (BROWN/BLACK/YELLOW)
- R2 1K ohm resistor 1/4 WATT (BROWN/BLACK/RED)
- VR1 4K7 miniature trimmer (adjuster)
- C1 0.1uF disc ceramic capacitor (marked 104)
- C2 10uF min radial electrolytic capacitor
- C3 0.22uF poly capacitor (marked .22 J 63)
- H1 2-pin header & link
- K1,2 2 X 2-way screw connector blocks (interlocking)
- CASE TYPE RX2007
- PCB TYPE P73
- WIRE not supplied with kit - any really fine flexible wire is suitable for bulb current

P73 KIT INSTRUCTIONS

PCB

The PCB has an insulated (Component Side) and a tinned track side. Components are mounted on the insulated side and soldered on the track side. The PCB for this Project is fully prepared and requires no additional work. Look carefully at the area of the PCB you are working on when soldering to ensure that you do not apply an extra connection with a splash of solder

TOOLS

For construction you will require a soldering iron with a fine pointed bit and flux cored solder (22 SWG recommended); a small pair of wire cutters, a screwdriver to make connections and, of course, a good level of light.

PARTS - DO NOT HANDLE ITEMS IN BLACK CONDUCTIVE FOAM UNTIL INSTRUCTED. (MOS DEVICES)

- The short bars with colour bands and a wire at each end are resistors. Only two are used in this kit, one being 1K (BROWN/BLACK/RED) and the other is 100K (BROWN/BLACK/YELLOW). The drawing shows the order to read them.
 - The tubular electrolytic capacitor (C2) is marked with the value and working voltage, it also has a band down one side of the plastic sleeve with (-) Negative sign on it which signifies which leg goes to the negative. The opposite leg of the capacitor, of course, goes to the positive. Capacitor polarisations (+ and -) are clearly shown on the drawing.
 - The small disc capacitor C1 (usually coated tan and marked 104) with two wires is not polarised and can be fitted either way round.
 - The square component with two wires at one end and marked .22 63 is a poly capacitor C3 value 0.22uF. It can be fitted either way round.
 - The 8-pin integrated circuit (IC1) is marked with its type code; see the drawing together with the Parts List. It is delivered in conductive foam and should be left in the foam until you are about to fit it. Being a MOS device, it can be damaged by static electricity and care must be exercised when handling. It is supplied with a socket. This will enable the builder to solder in the socket during construction, then fit the IC at the end of construction.
 - The MOSFET transistors (Z2N106A) have three legs and a black plastic body with a silver printed side which is also slightly rounded at each side of the print. These are MOS devices and care must be taken in handling. They must also be fitted as per the drawing. Note those slightly rounded corners on the component and ensure that they are fitted as in the drawing.
 - The two-legged connector H1 and its link are used to change from one mode to the other. It is a black moulding with two gold plated pins through it. The short pin end goes through the PCB for soldering, leaving the long pin ends sticking up. These are the pins to which you will connect the link. The link is the tiny moulding (normally red) with a metal strap inside it. The square black moulding with a white circle in the middle and three pins is VR1, a variable resistor for adjustments.
 - The two 2-way screw connectors (K1 & K2) are described by their name. They interlock to form a four-way connector.

CONSTRUCTION

NOTES ON CMOS DEVICE HANDLING. USE A SHEET OF ALUMINIUM; METAL COOKING FOIL WILL DO.

Place it on the work surface. Place the PCB, solder side down on it. Place the BLACK CONDUCTIVE FOAM on it, touch the metal with the soldering iron tip and then rest your hands on it, holding them there while you read through this part of the instructions. The PCB, any tools, the MOS IC and you are now all at the same potential, i.e. static neutralised.

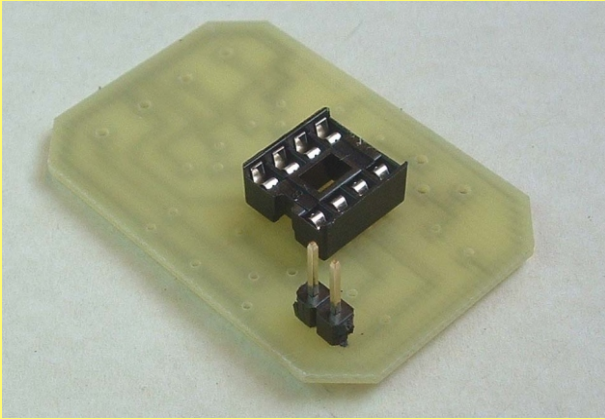
As few parts are used in the construction of the Multi Flasher, no construction notes are needed, just a few pointers.

- I would suggest that you fit the socket for IC2 first, it will help to give you your bearings as to what goes where. Note the small notch at one end of the plastic moulding and ensure that it is fitted as shown in the drawing, soldering all pins carefully.
 - Resistors can be fitted any way round as can C1 and C3 but C2 (10 uF electrolytic) must be fitted with care. The negative marked on the sleeve of it faces the outside edge of the PCB.
 - When fitting and soldering the screw-connectors K1, K2 note that the face with the holes for the wires must face the outer edge of the PCB so you can fit wires to them. I'm sorry if you think that is obvious but it *has* been known to be done wrong!
 - The adjuster VR1 will only fit one way round. You will have to press down firmly to ensure that it is flush with the PCB where the pins are a bit wider.
 - When you fit IC1 you should note the curved side on the moulding aligns with that shown on the drawing to ensure that it is fitted the right way round.
 - The MOSFETS (Z2N106A) are next, again note the curved side of the MOSFETS on the drawing and ensure in each case that the components are fitted the right way around. *Note that Q1 & Q2 are fitted facing in opposite direction.*
 - The 8-pin IC should be plugged into the IC socket as the last operation of construction.
 - As each component is fitted and soldered, the spare wire should be cut off close to the PCB, "Soldering Tips" may help.
 - The rear of the board can now be cleaned with something like an old toothbrush and some spirit cleaner. Meths will do but Isopropyl is very much better. Then check all over the soldered side of the board for good joints and no solder bridges between tracks or round pads. That's the PCB construction completed.

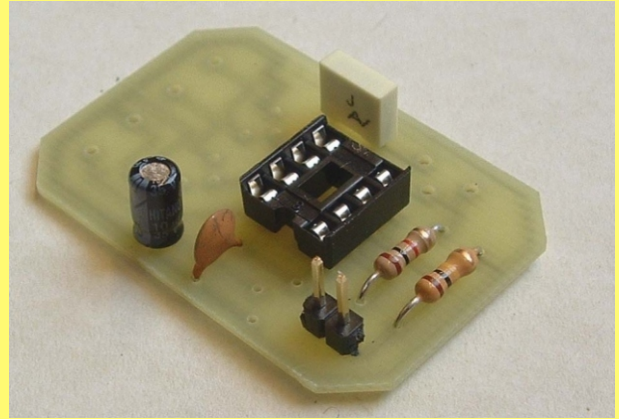
WARNING - DO NOT use the black foam as packing in the finished unit, it is CONDUCTIVE.

P73 MULTI-FLASHER

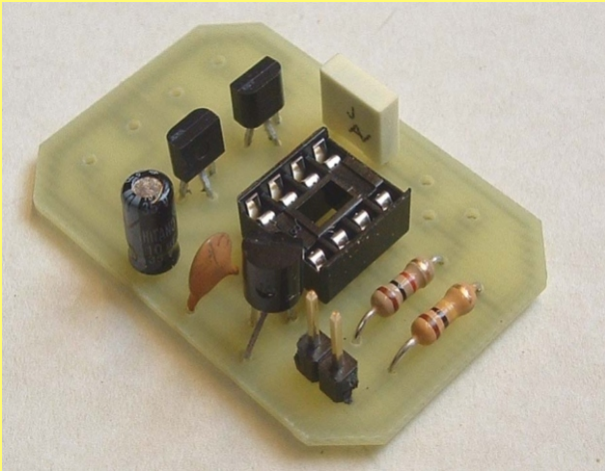
PHOTOGRAPHIC BUILD SEQUENCE FOR KIT VERSION ONLY



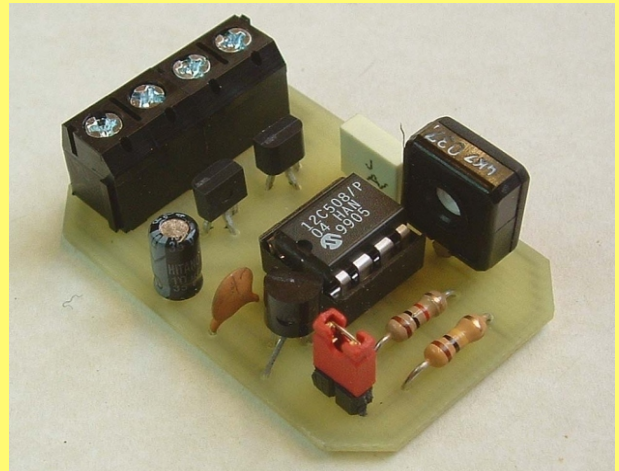
PICTURE 1: PCB with I/C socket and 2-pin header fitted



PICTURE 2: Resistors & capacitors added



PICTURE 3: Two MOSFETs added



PICTURE 4: Fit screw terminals, preset and I/C. NOTE! ANTI-STATIC PRECAUTIONS REQUIRED.



PICTURE 5: Finished unit, cased with sticker. White wires connect to bulbs - see datasheet