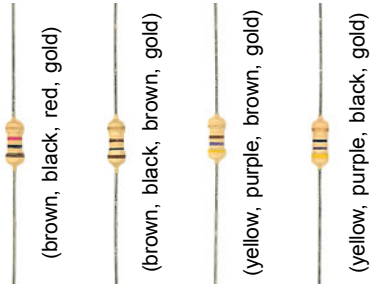
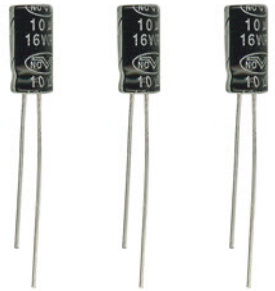
The IR-ritator

spoof an infrared remote control to play practical jokes

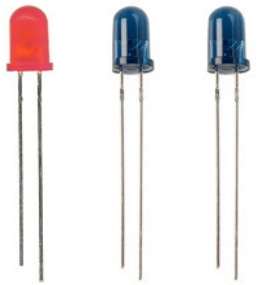


R1 (1k) R2 (100R) R3 (470R) R4 (47R)

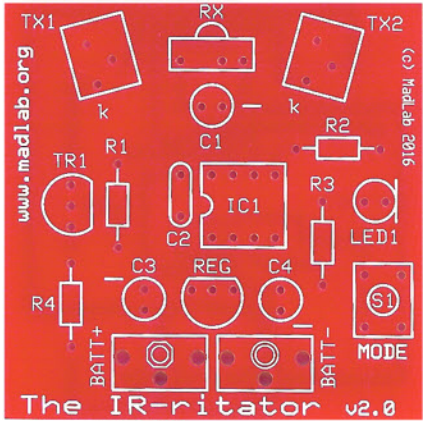


C1 (10u elec.) C3 (10u elec.) C4 (10u elec.)

C2 (100n)



LED1 (red) TX1 (blue) TX2 (blue)



Circuit board

IC1 (PIC12F1840)

IC1 socket

REG (78L05)

TR1 (MPSA13)

BATT+

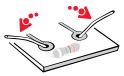
BATT-

S1

LED mounts

RX

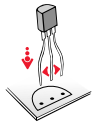
1. Identify the different components using the spotter chart.
2. Fit and solder the resistors (R1 to R4) to the circuit board telling them apart by the coloured bands around their bodies. They can be fitted either way around.



3. Solder the chip socket (IC1) matching the notch in the socket to the notch on the board. **Do not solder the chip directly to the board.**

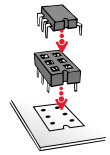
4. Solder the electrolytic capacitors (C1, C3 and C4) to the board putting the shorter leg into the hole with the – sign. The shorter leg also has a stripe on the side of the body. Solder the other capacitor (C2) either way around.

5. Solder the light (LED1) putting the shorter leg into the hole with the line. The shorter leg also has a flattened edge on the rim.



6. Solder the regulator (REG) matching the half-circle shape of the regulator to the half-circle shape on the board. Be careful not to mistake the transistor for the regulator.
7. Solder the transistor (TR1) matching the half-circle shape of the transistor to the half-circle shape on the board.
8. Solder the pushbutton (S1) either way around.

9. Fit the infrared transmitters (TX1 and TX2) into the LED mounts, bend their legs at right angles then solder them to the board within the marked rectangles such that the shorter leg is near the 'k' sign. The small peg should fit the hole in the board and the transmitters should both face outwards at a slight angle parallel to the board.
10. Solder the infrared receiver module (RX) to the board such that the cylindrical lens faces outwards.
11. Fit the battery connectors (BATT+ and BATT-) to the board matching the shape to the symbol on the board (the hexagonal connector is positive, the circular negative). Ensure the connectors are pushed fully into the board and are at right angles to it. Solder the connectors to the board making sure all the holes are well filled with solder.



12. Carefully bend the legs of the chip inwards a little with your fingers. Fit the chip into its socket matching the small notch in the chip to the notch in the socket.
13. Connect a battery **(9V PP3)** to the battery connectors. If *The IR-ritator* is working properly the light should flash.

HOW TO USE THE IR-RITATOR

The IR-ritator is a device for playing a practical joke on anybody who uses an infrared remote to control electrical equipment such as a television. It can record and mimic a remote control and disrupt the operation of a piece of equipment.

For example you could record the mute button on a TV remote control. Then when your victim is trying to watch television they will find that the sound disappears every few minutes. Needless to say this will be extremely annoying to them. Or, more irritating still, their TV might change channels by itself or even turn completely off.

The IR-ritator has three modes of operation. The pushbutton increments the mode which is indicated by 1 to 3 flashes of the light. The mode is saved when the battery is removed and initially mode 1 is active. The mode controls how frequently a recorded code is transmitted - every 10, 5 or 2 minutes for mode 1, 2 or 3 respectively.

When using *The IR-ritator* hide it out of sight in a room with the transmitters (TX1 and TX2) pointing towards the equipment to be disrupted. Cover the red light if it might be noticed (but don't block TX1 or TX2).

Recording a remote control code

Press and hold down the pushbutton (S1) for 2 seconds until the light flashes twice indicating *The IR-ritator* is ready to record. Then point your remote control directly towards the receiver module (RX) and press the button on the remote you wish to record. The light will come on as the code is recorded.

The recorded code will then be transmitted repeatedly every couple of seconds so you can test that it is working properly. Press the pushbutton when you've confirmed it has been recorded successfully then select the mode you want to use. Note that with some remotes only the first time it is transmitted will have an effect. The recorded code is saved when the battery is removed.

You might find *The IR-ritator* works more reliably if you record a remote control code away from strong ambient lighting.

The IR-ritator will work with most remote controls but it can not be guaranteed to work with all. Some remote controls use unusual carrier frequencies which are not detected by the receiver module. It will work with remotes that use a pulse width modulation scheme with a carrier between 30 and 60kHz and infrared light around 940nm.