

# DIY Kit 104 MUSIC BOX ENGINE

This kit is the electronic equivalent of a mechanical music box. It has a range of tunes. It is activated by light falling on a light dependent resistor (LDR) sensor. The kit can be placed anywhere that you want a tune to play when light falls on it: a cupboard, music box. Or there could be some applications where the LDR is replaced by a switch or a push-button.

## How it Works

The music generating IC forms the heart of the project. Two IC's are provided in this kit. M3481 contains 8 Christmas songs. M3485 contains 5 popular tunes: Hawaiian Wedding Song, Try to Remember, Aloha Oe, Love Story & Yesterday.

When light falls on the LDR the music IC is enabled by the positive potential appearing on pin 2. The sensitivity of the LDR can be changed by varying the value of R2. A tune is selected by pushing the PCB-mounted tact switch. The jumper J1 determines whether the selected tune will play continuously or will cycle through all the tunes available in the IC. The musical pitch is determined by the resistor R1. Decreasing the value of R1 lowers the pitch, and each tune takes longer to play. The RC network at pin 7 shapes the sound. The speaker is driven by a complementary pair of transistors driven by the IC. Negative feedback is provided by R3 to stabilise the DC voltage at the emitters of Q1 & Q2.

Jumper J2 selects whether or not a tune stops immediately the light onto the LDR falls, or it plays right through to its end before stopping.

In the resting state the circuit draws about 50uA, and about 20mA when it is operating. So there is no need for an off/on switch.

## Construction

Check the components provided against the parts list. It is generally best practice to add the lowest height components first: the resistors. To keep the PCB area small one of the resistors is placed under the IC. Make sure to get Q1 & Q2 correct. They are not the same. One is an NPN transistor while the other is a PNP type. Also make sure to get the electrolytic capacitors around the correct way.

The LDR has long legs so you can mount it at the ideal distance required for your application. The LDR can go in either way around. Finally select the IC you wish to use & push it into the IC socket the correct way around.

## Testing

Once the battery is connected the kit should immediately start to play a tune. If not check that all the components are in their correct positions, especially Q1, Q2 and the electrolytic capacitors. Check the solder connections.

## Reference

This project was reviewed in *Electronics Australia*, October 1996.

For more information visit our web site at <http://kitsrus.com>

## PARTS LIST

### Resistors 5%

|                           |            |   |
|---------------------------|------------|---|
| 6R8 .....                 | R4 R6..... | 2 |
| 33K .....                 | R7.....    | 1 |
| 68K .....                 | R1 R8..... | 2 |
| 100K .....                | R2 R9..... | 2 |
| 330K .....                | R3 R5..... | 2 |
| 4.7uF ecap.....           | C4.....    | 1 |
| 100uF mini ecap .....     | C1 C2..... | 2 |
| 68nF ceramic .....        | C3.....    | 1 |
| 2 pin header .....        |            | 2 |
| Jumpers.....              |            | 2 |
| Mini push-on switch ..... |            | 1 |
| LDR .....                 |            | 1 |
| 16 pin IC socket.....     |            | 1 |
| M3481 music IC .....      |            | 1 |
| M3485 music IC .....      |            | 1 |
| BC548.....                | Q1 .....   | 1 |
| BC558.....                | Q2 .....   | 1 |
| Kit 104 PCB .....         |            | 1 |
| 3V battery snap.....      |            | 1 |
| 8 ohm speaker.....        |            | 1 |

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