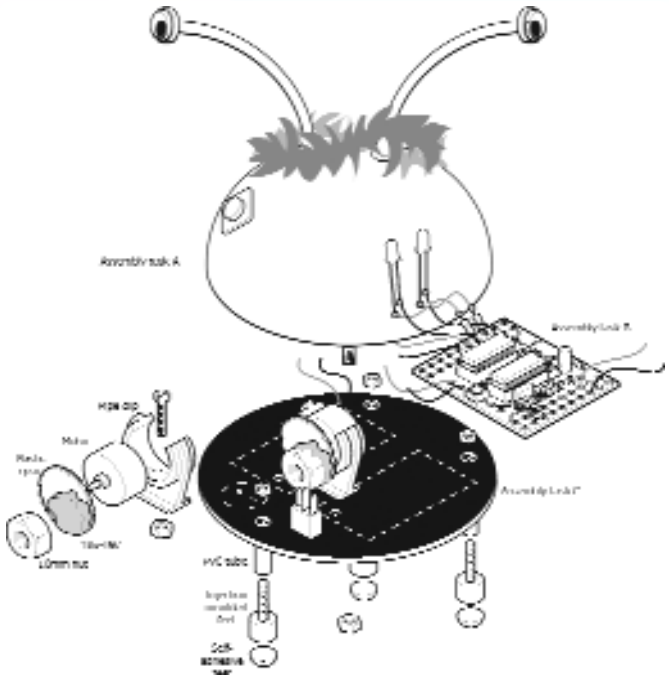
Calling all Jitterbug Fans!

Children and adults are fascinated with animated quasi-intelligent toys and products. The Jitterbug project was born from this fascination and provides pupils with an experience of incorporating systems and control into a highly desirable product.

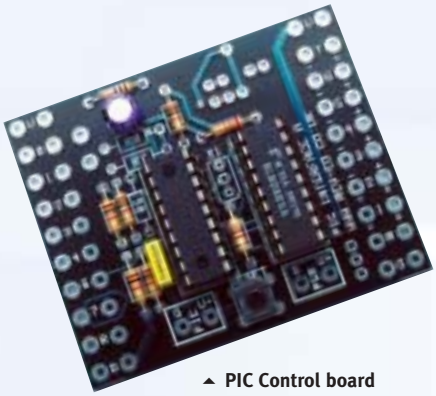
The original Jitterbug, developed in collaboration between **Sheffield Hallam University** and **TEP**, is a programmable electro-mechanical creature that is controlled by the use of a **PIC (Peripheral Interface Controller)**. Mechanical movement is achieved by the use of an eccentric rotating mass. When time is spent developing the PIC program, the Jitterbug will display a variety of entertaining behaviours through pupils interaction with a range of inputs.

The Jitterbug has become a source of inspiration for both teachers and pupils to develop their interest and capability within systems and control based activity. Through successfully infiltrating the design and technology curriculum in many schools, the Jitterbug has been developed to accommodate all levels of ability within both Primary, Secondary schools and beyond.

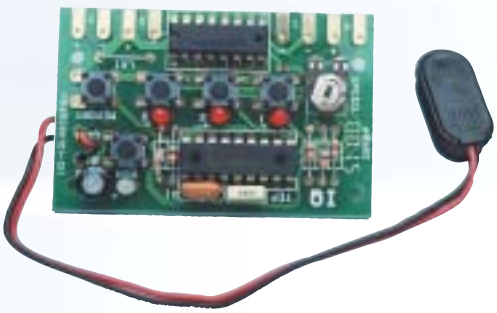


The following paragraphs (overleaf) provide guidance on two alternative control systems for the Jitterbug: the **IQ controller board** and **555 timer astable circuit board**, which offer opportunities for differentiation and low cost alternatives. They are less sophisticated in having fewer components, and reduce the level of controllability but still retain the essential characteristics of the original Jitterbug. Both systems can be easily substituted for the **PIC controller board** within the original Jitterbug construction.

ⓘ Guidance on the construction and final assembly of the Jitterbug can be found within the Jitterbug Teacher Guidance publication available through TEP and Middlesex Resources.



▲ PIC Control board



▲ IQ Controller board

Base level activity ▲

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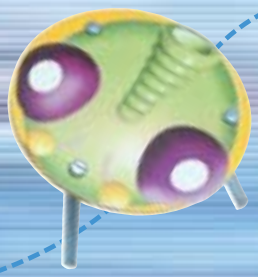
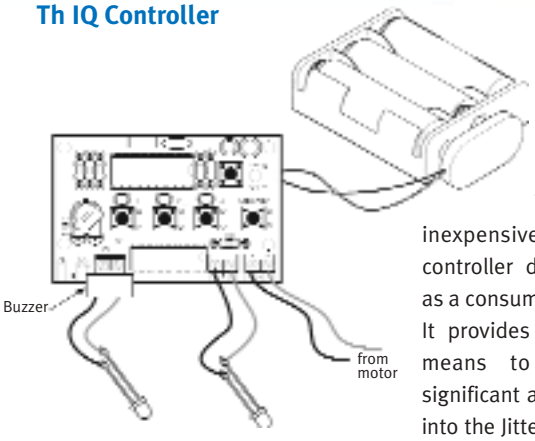


Th IQ Controller



The IQ is a small inexpensive programmable controller designed for use as a consumable component. It provides pupils with the means to still build a significant amount of control into the Jitterbug.

The IQ controller can be programmed to switch up to three outputs off and on in a desired sequence. Programming is achieved using the three program switches and the 'MEMORY' switch. The 'RUN' switch is used to start or stop a program. The IQ board can store a sequence of up to 60 steps. At each step, any of the three outputs can be switched off and on. You can change the time delay between each step by adjusting the program 'SPEED' dial.

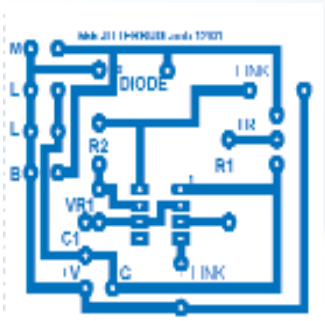
555 Astable Jitterbug

In this circuit, the motor and buzzer are connected in parallel. A standard 555 astable circuit is used to switch them on and off. The time period can be adjusted by using the potentiometer.
Two flashing LED's are used for the eyes and are connected independently.

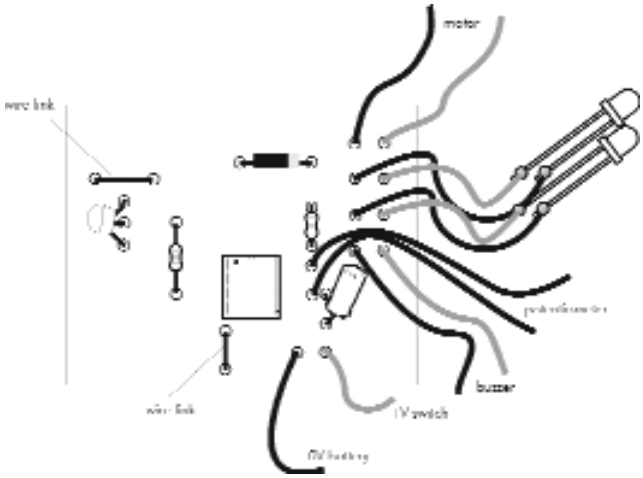
Resources for one Jitterbug 555 Astable circuit

The resources for this circuit replace the components required in assembly task B of the PIC based Jitterbug.

- 1kW resistor x 2
- 555 timer x 1
- 500mA transistor MPSA13 x 1
- Diode IN40001 x 1
- 22k potentiometer x 1
- 5V flashing LED's x 2
- 22uf capacitor x 1
- 8cm RED multi stranded wire x 2
- 8cm BLACK multi stranded wire x 2
- 12cm RED multi stranded wire x 2
- 12cm BLACK multi stranded wire x 4



Assembling the Astable circuit



1. Photocopy the PCB layout above. This circuit is reversed to enable correct orientation when the printed circuit board is manufactured.
2. Solder a length of black and red wire (8 cm long) to outputs M as shown on circuit board diagram.
3. Solder a length of black wire (12 cm long) to each short leg of the LED's and red wire to the long legs and connect to outputs L as shown.
4. Solder a length of red and black wire (8 cm long) to output B.
5. Solder the two 1kW resistor in positions shown.
6. Solder the diode and capacitor into positions shown ensuring they are correctly orientated. (Silver tip of diode should face the outputs. The negative leg of the capacitor should be connected to ground).
7. Solder the transistor into position. The flat side of transistor should face the outputs.
8. Solder two lengths of black wire (12cm long) to the potentiometer input position shown on the diagram. These will be connected to the potentiometer terminals during chassis circuit construction.
9. Create wire links in positions shown.
10. Solder the 555 timer chip holder into position in the correct orientation before placing chip.

Jitterbug Mania!

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Jitterbug mania is sweeping Bakewell as Allen Bower at **Lady Manners School** admits with a number of variations of the Jitterbug including this interesting one... 'Jitterstop'. It utilises a microswitch inverted beneath the base to set start and stop the bug, and can be 'parked' on a suitably designed bed to switch it off.

Another interpretation from **Lawrence Sheriff School** is this attractive vacuum formed bug shell providing lots of scope for characterising pupils bugs.

The project has spawned a whole new generation of ideas for the jitterbug including: "TV Critter" that leaps up and down every time you change channel or set the video and one version we rather like is 'Jitterphone' that is a mobile phone holder bug that gesticulates wildly when you have an incoming call.

ⓘ The Jitterbug project is supported by a teacher guidance booklet, one of a series developed at **Sheffield Hallam University** by Jenny Dein -TEP teaching fellow and her colleagues. This Millennium publication is available from TEP and Teaching Resources.