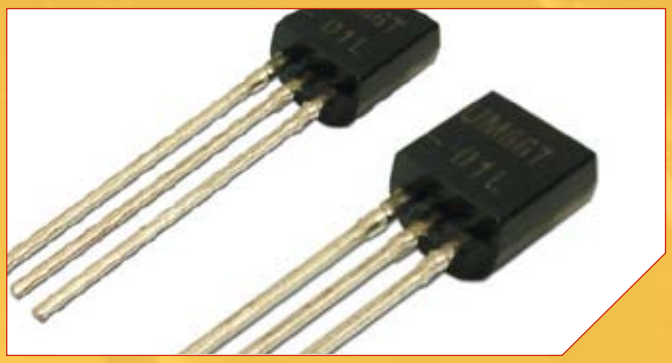
PRACTICAL PICAXE
PART 7

Making Music using the PICAXE 08M

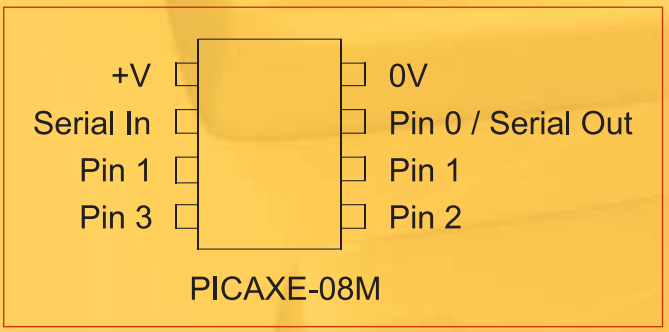
John Cook takes us through a step by guide to creating personal tones and tunes that are sure to grab pupils' attention.

For many years the easiest way to produce music into a project was to use a melody generator.

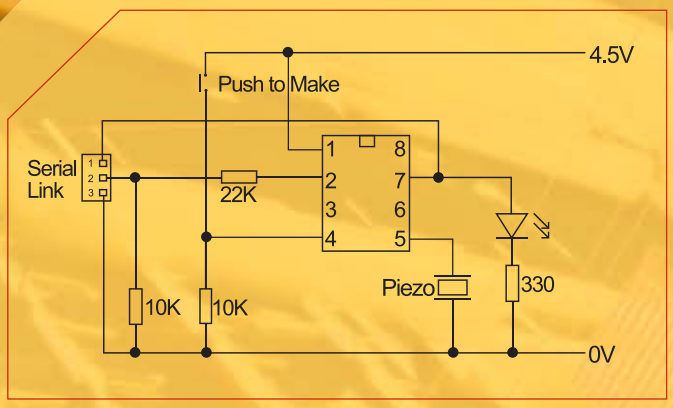


All that is required is a 3v battery and a small 8 ohm speaker to make a working project. Unfortunately these are becoming obsolete and the only ones that are currently available are "It's a small world" and "Wedding March" and these too will probably disappear when the current stock is sold.

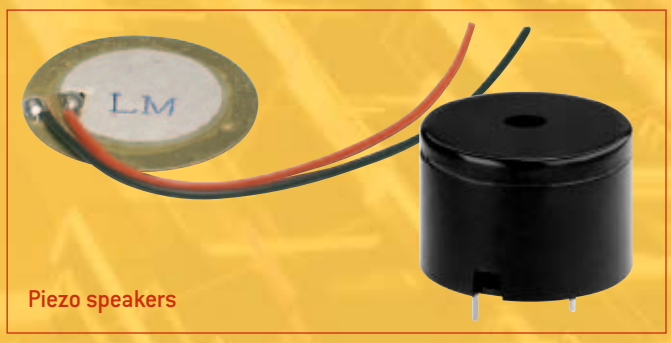
Thankfully the appearance of the PICAXE-08M will fill this void and revitalise interest for year 8 and 9 students onto electronics.



The PICAXE-08 and the PICAXE-08M have the same pin-outs; the difference being the 8M has twice as much memory and this along with a new tune 'memory saving' algorithm has allowed the 8M to have music playing capability.

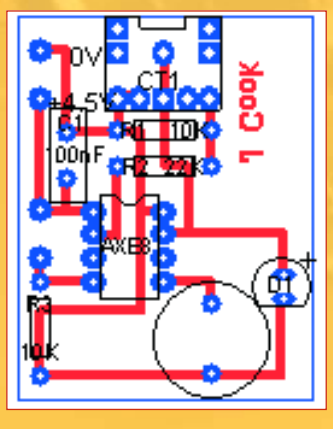


This is a very simple circuit that can use an uncased piezo but a clearer sound is achieved using a budget plastic cased piezo. On larger projects a richer sound is produced using an 8 ohm speaker in series with a 47μF capacitor.



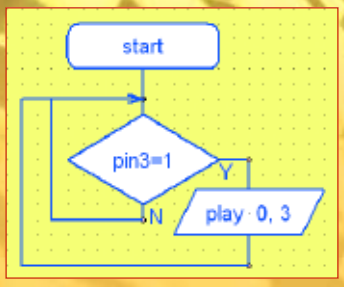
Piezo speakers

Note the use of an LED on pin7; this is not essential but it does excite students as it flickers as the programme is downloaded. It could also be programmed to flash as the music is played.



The PICAXE-8M is pre-programmed with 4 tunes (Happy Birthday, Jingle Bells, Silent Night and Rudolf the Red Nosed Reindeer) but more importantly can also be programmed with one of the thousand free ring tones that can be downloaded from the Web.

To play an internal tune, use the following simple flowchart:

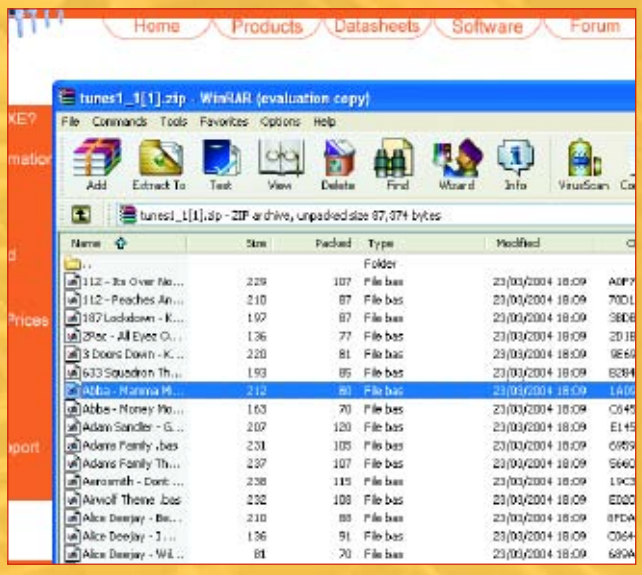


Play 0,3 is Happy Birthday, play 1,3 is Jingle Bells, play 2,3 is Silent Night and play 3,3 is Rudolf the Red Nosed Reindeer. Convert this to basic in the usual way:

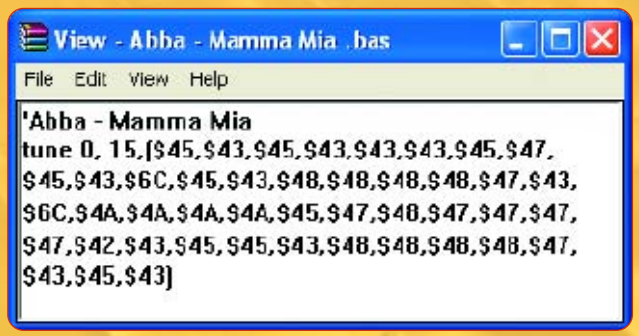
```
'BASIC converted from flowchart:
'Untitled Flowchart:1
'Converted on 27/01/2006 at 16:09:05
main:
label_14:       if pin3=1 then label_1D
                goto label_14

label_1D:       play  0, 3
                goto label_14
```

This can be downloaded to the PICAXE-8M in the normal way. This is a quick way of testing the circuit but the stimulating part is downloading ring tones of their own choice. There are approximately 1000 tunes on the software page of the PICAXE website.

Follow this procedure:



Select a ring tone from the list.



Double click on the ring tone to reveal the RTTTF (ring-tone-text-transfer-format).

Copy and paste the RTTTF into the PICAXE-08 Tune Wizard, located under PICAXE and then Wizards.

Produce the following basic programme within Programme Editor.

```
main:
        if pin3 = 1 then playit
        goto main

playit:
        pause 50
        if pin3 = 1 then play_tune

play_tune:
```

Paste the chosen tune after play tune.
This can now be downloaded in the usual way.

```
main:
        if pin3 = 1 then playit
        goto main

playit:
        pause 50
        if pin3 = 1 then play_tune

play_tune:

'Abba - Mamma Mia
Tune0,15,($45,$43,$45,$43,$43,$43,$45,$
47,$45,$43,$6C,$45,$43,$48,$48,$48,$48,
$47,$43,$6C,$4A,$4A,$4A,$4A,$45,$47,$48
,$47,$47,$47,$47,$42,$43,$45,$45,$43,$4
8,$48,$48,$48,$47,$43,$45,$43)
        goto main
```

This project can be a lot of fun and may stimulate some Year 9 pupils into pursuing a GCSE in Technology. Whether you love or hate ring tones they are here to stay and everyone at some time must have been subjected to the Crazy Frog!

Free ring tones are also available from:
www.free-ringtones.eu.com
www.tones4free.com

For colleagues who are thinking this would be a good project but we do not have the equipment or the time to manufacture PCB's, then watch this space as affordable read ultra low-cost mass produced boards are on their way soon.

For further help or assistance you can email John Cook at:
jcookIggs@hotmail.com