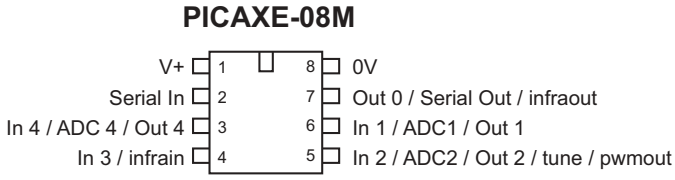
PICAXE-08M Features...



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SECTION 1 - What's new in the PICAXE-08M?

The PICAXE-08M supports all the standard commands and features of the PICAXE-08, with the following enhancements:

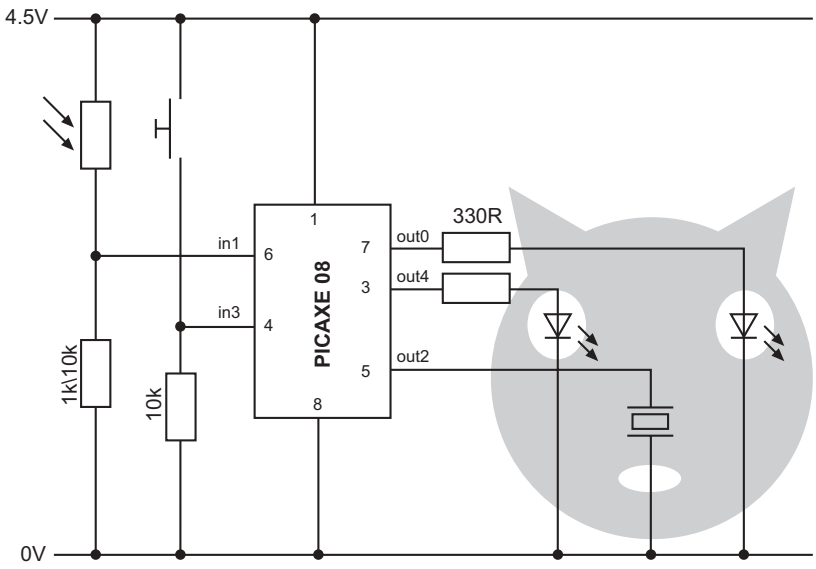
- Program memory 2x as long (approx. 80 lines)
- Musical tune playing capability, user generated or 4 pre-programmed tunes (Happy Birthday, Rudolf Red Nosed Reindeer, Silent Night, Jingle Bells) (play, tune commands)
- 10 bit and 8 bit adc option on 3 pins (readadc10/readadc commands)
- Interrupt feature on inputs (setint command)
- Infrared remote control input and output (infrain2/infraout commands)
- Continuously driven pwm motor drive output (pwmout command)
- Count high frequency pulses within a set time period (count command)
- Accurate digital temperature sensor interface (readtemp/readtemp12 commands)
- Read serial number from any Dallas 1-wire device (e.g. iButton) (readowsn command)
- User serial output via the serout pin / programming cable (sertxd command)
- Software support for increased 8MHz clock frequency (setfreq command).

See the BASIC Commands datasheet for further information on each command.

SECTION 2 - Music Support

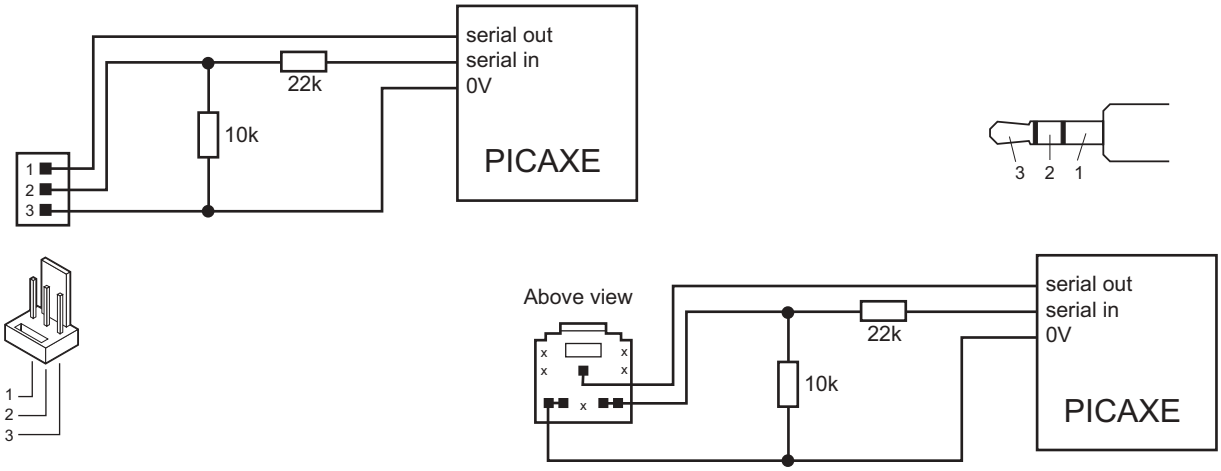
The PICAXE-08M has a new music feature to play tunes on a low-cost piezo sounder or speaker. The PICAXE-08M Tune Wizard (software version 4.1.0 or greater) allows Nokia mobile phone ring tones to be imported and played on the PICAXE-08M (monophonic RTTTL format). These ringtones are widely available free of charge on the internet.

Further information about this feature is available in the PICAXE-08M music datasheet. A typical simple student circuit to use this feature may be as follows:



Serial Download Circuit:

The serial download circuit for all PICAXE microcontrollers is (straight or 'stereo plug' cable connections):



SECTION 3 - PICAXE-08M Commands: (new commands in bold)

Output -	high, low, toggle, pulsout, let pins =
I/O -	input, output, reverse, let dirs =
Sound -	sound, **play, tune**
Input -	if…then, readadc, **readac10**, pulsin, button
Serial -	serin, serout, **sertxd**
Program Flow -	goto, gosub, return, branch
Loops -	for…next
Mathematics -	let… (+, -, *, **, /, //, max, min, &, |, ^, &/, |/, ^/)
Variables -	if...then, random, lookdown, lookup
Data memory -	eeprom, write, read
Delays -	pause, wait, nap, sleep, end
Miscellaneous -	symbol, debug
RAM -	**peek, poke**
Servo Control -	**servo**
Infrared -	**infrain2, infraout**
Interrupt -	**setint**
Temperature -	**readtemp, readtemp12**
1-wire Serial No -	**readowsn**
PWM -	pwm, **pwmout**
Counting -	**count**

Please see the BASIC Commands help file for more detailed syntax help and information about each command.

SECTION 4 - Resonator Frequency and Overclocking.

All PICAXE functions are based upon a 4MHz resonator frequency. This is the only frequency recommended. However the user may choose to 'overclock' the PICAXE-08M if desired, although this is not recommended unless absolutely necessary for a particular project (e.g. when using the count command). With the -08M the internal resonator has a default value of 4MHz. However it can be increased by the user to 8MHz via use of the 'setfreq m8' command (or reset back to 4MHz by use of 'setfreq m4' command).

Commands affected by resonator frequency.

Many of the commands are affected by a change in resonator frequency. A summary of the important commands affected are given below (see BASIC Commands datasheet for detailed command syntax).

count

The base unit of count is	The pin is checked every
1ms at 4MHz	20us at 4MHz (max. 25kHz pulse rate)
0.5ms at 8 MHz	10us at 8MHz (max. 50kHz pulse rate)

pause / wait

The base unit of pause is:	The base unit of wait is:
1ms at 4MHz	1s at 4MHz
0.5ms at 8 MHz	0.5s at 8 MHz

pulsout / pulsin

The base unit of pulsout/pulsin is:
- 10us at 4Mhz
- 5us at 8Mhz

pwmout

The period and duty cycle should be calculated using 4MHz or 8MHz as appropriate.

serin / serout / sertxd

Due to the sensitive nature of serial communication no guarantee is given that serin or serout commands will work at any frequency other than 4MHz. However the theoretical baud rates at the higher clock frequencies are as follows:

Baudmode	4MHz	8MHz
300	300	600
600	600	1200
1200	1200	2400
2400	2400	4800

sound / tune / play

The duration of sound (12ms at 4MHz) will be reduced to 6ms (8MHz)
The speed of tune and play will be doubled

Commands that do not work at 8 MHz

The following commands will not work at 8 MHz due to timing issues with the external device listed. Change back to 4MHz before using these commands.

- infrain2 / infraout (infrared remote)
- readtemp / readtemp12 (DS18B20 temperature sensor)
- readowsn (1-wire device)
- servo (servo)

Commands that are not affected by frequency changes.

The following timing commands are NOT affected as they use a separate internal r/c timer:

- nap and sleep