PICAXE-08M2 Commands Summary & Help Document

**1. Experimenter board (AXE092) symbol definitions**

Symbol definitions are very useful for writing better readable programs and are used in the examples here. Symbol definitions do not consume any extra memory, so use them often (including comments/remarks using the ‘ character)

SYMBOL RedLED = C.0 ‘ This is the output pin to the red LED SYMBOL YellowLED = C.1 SYMBOL GreenLED = C.2 SYMBOL SwitchInput = pinC.3 SYMBOL LightSensorInput = C.4 SYMBOL Loudspeaker = C.2

**2. Variables & Registers**

For calculations and storage of small values, 8-bit registers can be used. Larger values can be managed in 16-bit registers (which are combinations of two 8-bit registers*): See LET command (opposite side) for the use of registers in calculations*

- 8-bit registers (valid values: 0 … 255): **b0**, **b1**, **b2**, … , **b27** - 16-bit registers (valid values: 0 … 65535): **w0**[b1,b0], **w1**[b3,b2], …**w13**[b26,b27]

A register can be given a meaningful name (which should not contain spaces), e.g.:

***SYMBOL***  *counter = b2*

**3. Most important commands**

All BASIC commands described here are treated in detail in the BASIC manual. This manual can be found under the “Help” section of the Programming Editor.

a. Output commands

**HIGH/LOW/TOGGLE pin (,pin, ..):**  Put one ore more output pin(s) HIGH or LOW:

***HIGH*** *RedLED, GreenLED ‘ light up red & green LEDs* ***TOGGLE*** *YellowLED ‘ change yellow LED state*

**PLAY tune, option:**  Play one of the four tunes at the tune pin:

 *SYMBOL Rudolph\_Rednose = 3* ***PLAY*** *Rudolph\_Rednose, 1*

**SOUND** **channel\_nr, (note, duration, note duration, ..)** Play sequence of tones with specified duration (in units of 10 millisecs):

***SOUND*** *Loudspeaker, (65, 200, 98, 200) ‘ Play two notes (2 secs. each)*

b. Input commands

For testing the level (HIGH or LOW, resp. 1 or 0) of any input pin, see IF THEN ELSE command in the “Program control” section (d) below.

**READADC channel\_nr, variable**: Read the voltage level on an input pin and translate into number between 0 (0V) and max. 255 (equal to battery voltage)

*SYMBOL LightIntensity = b0* ***READADC*** *LightSensorInput, LightIntensity*

c. Timing related commands

**PAUSE millisec:** Wait specified number of milliseconds (0 .. 65535)

***PAUSE***  *1000 ‘ wait 1 second = 1000 ms.*

d. Program control

In order to change the sequence in which a series of commands are executed, a number of control commands are available. These can either make a selection (IF) or repetition of a code part (DO .. LOOP and FOR .. NEXT control commands):

**IF condition THEN .. ELSE .. ENDIF:** Make a choice based on a condition:

 ***IF*** *SwitchInput = 1* ***THEN*** *HIGH GreenLED* ***ELSE*** *LOW GreenLED* ***ENDIF***

**DO .. LOOP (WHILE / UNTIL condition):** Repeat code while/until conditions holds:

***DO WHILE*** *SwitchInput = 1 HIGH YellowLED ‘ If switch pressed then light LED* ***LOOP*** *LOW YellowLED*

**FOR .. TO .. NEXT:** Special compact form of DO .. LOOP when number of repetitions is known

***FOR*** *counter = 1* ***TO*** *3 PLAY Rudolph\_Rednose, 1 ‘ (play song 3 times)* ***NEXT*** *counter*

e. Variables etc.

**LET variable = expression:** Give a variable a value equal to the value of the expression at the right side:

 *SYMBOL counter = b0 SYMBOL square = b1* ***LET*** *counter = 2* ***LET*** *counter = counter + 1 ‘ (counter becomes 3)* ***LET*** *square = counter \* counter ‘ (square gets value 3x3=9)*

f . Other

**GOSUB name .. RETURN:** Go to a subroutine with the defined name (and with RETURN at its end) and then return to the next command after the calling GOSUB command:

 ***GOSUB*** *Blinkleds (next command) … …*

***Blinkleds:*** *FOR counter = 1 TO 5 TOGGLE GreenLED PAUSE 200 NEXT counter* ***RETURN***

**RANDOM variable:** Generate a random number in the variable

 *SYMBOL GuessWhat = b0* ***RANDOM*** *GuessWhat*

**4. PICAXE-08M2 pin / channel number definitions**



Note: **Ignore** the pin numbers inside the box, these have no meaning for programming! Only the channel numbers C.1 – C.5 **outside** are used in programs.

**5. HELP, programming the circuit (download) doesn’t work !!!**

In case of download problems, check using the following steps in sequence:

1. Are the batteries correctly inserted (otherwise: switch off !! and reverse)?
2. Is power switched on, is the programming cable connected?
3. Switch off power to your electronic project circuit, press the Program/Download button in the Programming Editor, and then directly switch on the power again, now a download should start directly.
4. Is the correct serial port selected (always to be checked when the Programming Editor is started, always connect the cable before starting the editor)!
	1. In the Workspace Explorer window (Settings tab) go to the “COM Port” section, select the AXE027 PICAXE USB port from the list.
	2. If it was not on the list, click on “Refresh COM ports”, then it should be in the list again. If not, the required USB-driver was not installed.
	3. Install the USB-drivers for the AXE027 download cable (see picaxe website for instructions) and start at step 1 again.
5. Do a “Check PICAXE type connected” operation in the Workspace Explorer/ PICAXE Type section, check also that PICAXE-08M2 (or the device you use) is selected, this should return a firmware revision number.
6. Check battery voltage, still reasonably charged (> 2.4 V)?
7. Call The Local Expert or – if not in a hurry - ask on the Picaxe forum