

Overview

In this unit your students should:

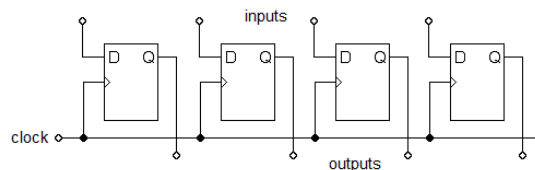
- meet a block diagram for a PIC
- understand that a PIC use registers to store information
- understand how logic gates can be used process words held in registers
- know that a PIC contains an oscillator which provides clock pulses for registers
- find out how to measure the processing speed of a PIC

This should not require more than 2 hours of class time.

Hour	Suggested Activity
1	<p>Get students to work through the questions on the Hardware exercises.</p> <p>As they finish, let them start the Maximum speed practical.</p> <p>There is no expectation that students should be able to analyse the flowcharts at this stage. They should find that the PICAXE-18 can only process about 2500 instructions per second.</p> <p>As they finish, they could start the Processing time practical. They will have an opportunity to finish it off in a later session.</p> <p>Ask students to answer question 1 on page 155 of the text book before the next session.</p>
2	<p>Students should spend this session answering questions 2 and 3 on page 155 of the text book.</p> <p>As they finish, they could continue with the Processing time practical. Not all students will get this far.</p> <p>Ask them to study 9.3 before the next session.</p>

Model Answers

- 1 (a) A register holds binary words.
 (b)



- (c) Place the four-bit word at the inputs. Pulse clock high.
 The four-bit word should now be safely frozen at the inputs.

- 2 The reset pin forces the contents of all the registers to zero when it is activated.
 The serial pins are used to communicate with the host computer during the download of a new program.
 The input port latches two-bit words from systems outside the PIC.
 The output port feeds out four-bit words to systems outside the PIC.
 The adc ports convert voltages at their inputs into binary words which can be processed by the PIC.

- 3 (a) An address is a binary word which labels a unique location in the PIC's memory.
 (b) There are $2^6 = 64$ different locations, each of which stores 8 bits, so the memory stores $64 \times 8 = 512$ bits.
 (c) The memory holds the program which determines the sequence of register operations performed by the PIC.