

'-----Title-----

' File.....serin2_pwm.pbp
' Started....12/23/08
' Microcontroller used: Microchip Technology PIC16F88
' microchip.com
' PicBasic Pro Code: micro-Engineering Labs, Inc.
' melabs.com

'-----Program Description-----

' Program uses SERIN2 command to receive command from
' the PC to control the rotational speed of a motor.

'----Terminal Program Options-----

' HyperTerminal - 9600 baud 8N1, Flow control = None
'
' To download TeraTerm Pro 3.1.3, see:
' <http://www.ayera.com/teraterm/download.cfm>
' and download TeraTerm Pro Web 3.1.3.
' The terminal program must be the active window for this
' program to work.

'-----Related Sites-----

' See: <http://www.melabs.com/resources/samples/pbp/ser2mod.bas>

'-----Connections-----

16F88 Pin	Function	Name Given In Program	Wiring
RB4		PWMout	1K Resistor to Base of 2N2222A transistor
RB2	Receiver Pin	PICSI	MAX232 Pin 9
RB5	Transmit Pin	PICSO	MAX232 Pin 10

' See the schematic for the PIC power and MCLR connections

MAX232 Pin	Datasheet Designation	Function and Wiring
Pin 7	T2OUT	Receive Data to Male RS232 DB9 Pin 2
Pin 8	R2IN	Transmit Data from Male RS232 DB9 Pin 3
Pin 9	R2OUT	Receive Data to PIC RB2
Pin 10	T2IN	Transmit Data from PIC RB5

' See schematic at:
' http://cornerstonerobotics.org/schematics/pic_programming_serin2_pwm.pdf

'-----Revisions-----

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' 9/21/10 Initiatize RB5 to HIGH

'-----Constants/Defines-----

    DEFINE OSC          8          ' Defines oscillator setting at 8 MHz.
                                     ' For SEROUT2, an oscillator speed faster
                                     ' than 4MHZ may be required for reliable
                                     ' operation at 9600 baud and above.

'-----Variables-----

    InputData   VAR   BYTE   ' Variable to receive input data
    PulseWidth  VAR   BYTE   ' Variable for pulse width
    MODE        VAR   WORD   ' WORD for MODE value
    PICSI       VAR   PORTB.2 ' Names PORTB.2 name as PICSI
    PICSO       VAR   PORTB.5 ' Names PORTB.5 name as PICSO
    PWMout      VAR   PORTB.4 ' Names PORTB.4 as PWMout

'-----Initialization-----

    ANSEL = 0          ' Changes analog bits to digital.
                       ' See table below.

'
'   Analog Bit      Analog or Digital      PIC16F88 Pin
'   -----
'   AN0             Digital                 RA0
'   AN1             Digital                 RA1
'   AN2             Digital                 RA2
'   AN3             Digital                 RA3
'   AN4             Digital                 RA4
'   AN5             Digital                 RB6
'   AN6             Digital                 RB7

'
    OSCCON = $70      ' Sets the internal oscillator in the
                       ' 16F88 to 8 MHz

    TRISB = %11101111 ' Sets RB4 to output

    PORTB = %00100000 ' Sets PIC transmit pin RB5 to HIGH

'-----Main Code-----

    MODE = 84         ' Set RX/TX speed to 84 for 9600 baud
                       ' MODE = 188 (4800 baud)
                       ' MODE = 396 (2400 baud)
                       ' See appendix in manual for other
                       ' MODE examples.

    PulseWidth = 255 ' Set initial value for PulseWidth

' Instructions sent to terminal program

    SEROUT2 PICSO, MODE, ["          Instructions:",10,13]
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SEROUT2 PICSO, MODE, [ " ",10,13]
SEROUT2 PICSO, MODE, ["After the bell tone from the computer speaker,"
10,13]
SEROUT2 PICSO, MODE, ["you have 2 seconds to type in any number
between",10,13]
SEROUT2 PICSO, MODE, ["0 and 255. Then hit the enter key.",10,13]
SEROUT2 PICSO, MODE, ["Or, after the bell tone, you have 2 seconds to",
10,13]
SEROUT2 PICSO, MODE, ["type in any letter, then a number between",10,
13]
SEROUT2 PICSO, MODE, ["0 and 255, then another letter. The",10,13]
SEROUT2 PICSO, MODE, ["non-digits before and after the number",10,13]
SEROUT2 PICSO, MODE, ["are ignored and the number is assigned to",10,
13]
SEROUT2 PICSO, MODE, ["the variable InputData",10,13]

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start:

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SERIN2 PICSI, MODE, 2000, nodata, [DEC InputData]
' SERIN2 uses a timeout and a label.
' If we get no input data within 2000 ms,
' we jump to nodata, and use the last
' value we had for PulseWidth.
' Format:SERIN2 Pin,Mode,Timeout,Label,[Item1]
' Pin = PICSI,(RB2), Declared in variables
' Mode = 84 (9600 baud rate)
' Timeout = 2000 ms
' Label = nodata
' [Item1] = [DEC inputData]
' The Jameco gearhead motors that we tested
' would not turn with PWM Duty values
' less than 170 (a 67% duty cycle).

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SEROUT2 PICSO, MODE, [DEC InputData,10,13]
' Format: SEROUT2 Pin, Mode, [Item1]
' Pin = PICSO,(RB5), Declared in Variables
' Mode = 84 (9600 baud rate)
' [Item1] = [DEC InputData, 10, 13]
' Transmits Value of InputData, 10
' (the ASCII codes for line feed),
' and 13 (the ASCII code for carriage return)
' to the PC.

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PulseWidth = InputData
' Set pulseWidth = inputData

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nodata:
' nodata label, program jumps to nodata if
' data is not received within 1000 ms timeout.

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PWM PWMout,PulseWidth,800
' Format: PWM Pin,Duty,Cycle
' Pin = PWMout,(RB4), Declared in variables
' Duty = PulseWidth, a variable with
' values between 0(0%) and 255(100%).
' Cycle = 800, PWM signal sent out RB4

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' for 800 cycles.

SEROUT2 PICS0, MODE, [7]

' Sends bell tone to computer speakers

GOTO start

END