

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

' File.....serin2\_pwm\_wait.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](http://cornerstonerobotics.org/schematics/pic_programming_serin2_pwm.pdf)

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'-----Revisions-----
' 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
    pinin       VAR   PORTB.2  ' Names PORTB.2 name as pinin
    pinout      VAR   PORTB.5  ' Nmaes PORTB.5 name as pinout
    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

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```
SEROUT2 pinout, MODE, ["      Instructions:",10,13]
SEROUT2 pinout, MODE, [" ",10,13]
SEROUT2 pinout, MODE, ["After the bell tone from the computer speaker,
",10,13]
SEROUT2 pinout, MODE, ["the program waits for you to type in the",10,
13]
SEROUT2 pinout, MODE, ["letter a then a number between 0 and 255,",10,
13]
SEROUT2 pinout, MODE, ["then hit the enter key.",10,13]
SEROUT2 pinout, MODE, ["The number is assigned to the variable
InputData",10,13]
```

start:

```
SEROUT2 pinout, MODE, [7]
    ' Sends a bell tone to computer speakers.

SERIN2 pinin,MODE,[WAIT("a"),DEC InputData]
    ' Format:SERIN2 Pin,Mode,[Item1]
    ' Pin = pinin,(RB2), Declared in variables
    ' Mode = 84 (9600 baud rate)
    ' [Item1] = [Modifier WAIT("a"), which
    ' makes the program wait
    ' for the letter a to be typed in, then
    ' DEC InputData, the input data.
    ' The Jameco motor that we used would
    ' not turn with PWM Duty values less
    ' than 170 (a 67% duty cycle).

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

PulseWidth = InputData
    ' Set PulseWidth = InputData

PWM PWMout,PulseWidth,1000
    ' Format: PWM Pin,Duty,Cycle
    ' Pin = PWMout,(RB4), Declared in variables
    ' Duty = PulseWidth, a variable with
    ' values between 0(0%) and 255(100%).
    ' Cycle = 1000, PWM signal sent out RB4
    ' for 1000 cycles, then the motor stops.
```

GOTO start

END