

```
'-----Title-----
' File.....serout2_potentiometer_10bit.pbp
' Started....12/16/08
' Microcontroller used:  Microchip Technology PIC16F88
'                          microchip.com
' PicBasic Pro Code:  micro-Engineering Labs, Inc.
'                          melabs.com

'-----Program Description-----
' Program uses SEROUT2 command to send 10-bit value
' of potentiometer reading to a PC terminal program.

'-----Related Lessons-----
' RS232 Serial Communications Hardware:
' http://www.cornerstonerobotics.org/curriculum/lessons_year2/erii_rs232_1.
pdf

' -----Terminal Program-----
' For the PIC to communicate with the PC,
' you will need to install a terminal program.
' Windows XP comes with HyperTerminal.
' HyperTerminal is found in your start menu via,
' Start Menu > Accessories > Communications > HyperTerminal.
' At the Connection Description screen, type in a name such
' as 9600_link and choose any icon.  Press the OK button.
' At the Connect To screen, set the "Connect using:"
' to the proper com port -  for example COM1.  Press OK.
' At the COM1 Properties screen, make the following settings:
'
'   Bits per second      9600
'   Data bits            8
'   Parity                None
'   Stop bits            1
'   Flow control         None
'
' Press OK button

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

'   16F88 Pin   Function      Name Given      Wiring
'               -----
'               -----
'               -----
'   RA4         -             -              Potentiometer
'   RB2         Receiver Pin  -              MAX232 Pin 9
'   RB5         Transmit Pin  PICS0          MAX232 Pin 10
'
' See the schematic for the PIC power and MCLR connections

' MAX232 Pin  Datasheet      Function and Wiring
```

```

'          Designation
' -----
' 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://www.cornerstonerobotics.org/schematics/pic\_programming\_serout2\_potentiometer.pdf
'-----Revisions-----
' 9/21/10 Initiatize RB5 to HIGH
'-----Constants/Defines-----
DEFINE ADC_BITS  10      ' Sets the number of bits in
                          ' the result to 10
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-----
x      VAR  WORD      ' WORD for potentiometer input
PICSO  VAR  PORTB.5    ' Defines PORTB.5 name as PICSO
                          ' (PIC Serial Out)
'-----Initialization-----
ANSEL = %00010000      ' Leaves AN4 in analog mode, but
                          ' changes other 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             Analog                 RA4
' AN5             Digital                RB6
' AN6             Digital                RB7
'
ADCON1 = %10000000    ' Right justifies 10-bit value of x
                          ' in 16-bit WORD. Adds "0" in the
                          ' 6 Most Significant bits of the WORD,
                          ' shifting the 10-bit value of x to
                          ' the right. This changes the
                          ' values to 0 - 1023.

```

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

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

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

start:

    ADCIN 4, x        ' Read analog voltage on AN4 and
                      ' convert to 10-bit digital value
                      ' and store as x.

    SEROUT2 PICS0, 84, ["POT = ", DEC x, 10, 13]
                      ' Format: SEROUT2 Pin, Mode, [Item1]
                      ' Pin = PICS0, Declared in Variables
                      ' Mode = 84 (9600 baud rate)
                      ' [Item1] = ["POT = ", DEC x, 10, 13]
                      ' Transmits POT = , the 10-bit
                      ' value of x, 10 (the ASCII codes for
                      ' line feed), and 13 (the ASCII code
                      ' for carriage return) to the PC.

    PAUSE 1000        ' Pause 1 sec between readings

    GOTO start        ' Go to loop label

END
```