

```
'-----Title-----
' File.....multiplex_tx3.pbp
' Started....9/1/12
' Microcontroller used: Microchip Technology PIC16F88
'                          microchip.com
' PicBasic Pro Code: micro-Engineering Labs, Inc.
'                          melabs.com

'-----Program Description-----
' The program uses two of the analog-to-digital
' converters,(AN0 and AN1), to measure the voltage
' on the center pin of two potentiometers (analog signals).
' It then converts the analog voltages into 8-bit
' digital values (0 to 255) and transmits the digital
' values through a fiber-optic cable to a fiber-optic
' receiver.

'-----Schematic-----
' See schematic at:
' http://cornerstonerobotics.org/schematics/control5\_multiplex\_tx\_rx3.pdf

'-----Related Lesson-----
' http://cornerstonerobotics.org/curriculum/lessons\_year3/eriii23\_control\_navigation6.pdf

'-----PicBasic Pro Commands-----
' The PicBasic Pro Compiler Manual is on line at:
' http://www.microengineeringlabs.com/resources/index.htm#Manuals

'-----Variables-----
      x  VAR BYTE      ' Byte for potentiometer 1 input
      y  VAR BYTE      ' Byte for potentiometer 2 input

'-----Initialization-----
      DEFINE OSC      8          ' Oscillator is defined as 8 MHz.

      DEFINE HSER_RCSTA 90h      ' Set receive register to receive
enabled
      DEFINE HSER_TXSTA 20h      ' Set transmit register to transmitter
enabled
      DEFINE HSER_BAUD 9600      ' Set baud rate to 9600
      DEFINE HSER_BITS 8        ' Sets each data bit to an 8-bit value.

      PORTB = %00100000        ' All PORTB pins are low except RB5(TX)
      OSCCON = $70             ' Internal oscillator is manually
                              ' set to 8 MHz.
      TRISA = %00000011        ' Sets PORTA pins RA0 and RA1 as inputs,
                              ' and all other PORTA pins as outputs.
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ANSEL = %00000011           ' Sets AN0 and AN1 in analog mode,  
                             ' but changes other analog pins to  
                             ' digital. See table below.
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<i>Analog Bit</i>	<i>Analog or Digital</i>	<i>PIC16F88 Pin</i>
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<i>AN0</i>	<i>Analog</i>	<i>RA0</i>
<i>AN1</i>	<i>Analog</i>	<i>RA1</i>
<i>AN2</i>	<i>Digital</i>	<i>RA2</i>
<i>AN3</i>	<i>Digital</i>	<i>RA3</i>
<i>AN4</i>	<i>Digital</i>	<i>RA4</i>
<i>AN5</i>	<i>Digital</i>	<i>RB6</i>
<i>AN6</i>	<i>Digital</i>	<i>RB7</i>

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' For the ANSEL Register table, look at the  
' PIC16F88 datasheet. For Microchip PIC datasheets, see:  
' http://www.microchip.com/stellent/idcplg?IdcService=SS\_GET\_PAGE&nodeId=2046  
' Select 8-bit PIC Microcontrollers, then the device from the  
' drop down menu. Now download the 16F88 Datasheet.  
' The ANSEL Register is Register 12-1: ANSEL Register,  
' look around page 113 in the 16F88 datasheet.
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'-----Main Code-----'
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start:
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    ADCIN 0, x           ' Read analog voltage on AN0 and  
                        ' convert to 8-bit digital value  
                        ' and store as x.  
  
    ADCIN 1, y           ' Read analog voltage on AN1 and  
                        ' convert to 8-bit digital value  
                        ' and store as y.  
  
    HSEROUT ["B0", x, y] ' Serial output, B0 is start bit, x and y  
                        ' are variables containing potentiometer  
                        ' values.  
  
    GOTO start           ' Go to start label  
  
    END
```