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'-----Title-----
' File.....multiplex_rx3x.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 receives an 8-bit digital value (0 to 255)
' of x and from a fiber-optic receiver and converts the value
' of x into a PWM signal to a dc motor.

'-----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
z  VAR BYTE

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

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.

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 CCP1_REG    PORTB    ' Set PORTB for CCP1
                          ' (Capture/Compare/PWM) Channel 1.
DEFINE CCP1_BIT    0        ' Set Set bit 0 for CCP1
                          ' (Capture/Compare/PWM) Channel 1.
ANSEL = 0                ' Changes analog bits to digital.

OSCCON = $70              ' Sets the internal oscillator in the
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                                ' 16F88 OSCCON register to 8 MHz
TRISB = %00000100              ' Set PIC receive pin to input
PORTB = %00100000              ' Set PIC transmit pin RB5 to HIGH

'-----Main Code-----
start:
    HSERIN[WAIT("B0"), x, y]    ' Serial input, B0 is start bit, x and y
                                ' are data bits. This PIC only uses the
                                ' value for x.

    z = x/2 + 125               ' Changes range of PWM values from 0-255
                                ' to 125-252.

    HPWM 1, z, 20000           ' Output PWM pulse on Channel 1
                                ' (Pin RB0 specified above) at duty cycle
                                ' "z" [0 (OFF all the time) to
                                ' 255 (ON all the time)] at frequency
                                ' of 20,000 Hz.

    GOTO start
```