

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

' File.....sonar2.pbp
' Started....5/15/06
' Microcontroller used: Microchip Technology 16F88
' microchip.com
' PBPro Code, micro-Engineering Labs, Inc.
' melabs.com

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

' Using the Devantech SRF04 ultrasonic range finder,
' the distance from the range finder to an object
' is displayed on an LCD screen in inches and LED's
' light up showing the closeness to that object
' according to the table below.

Distance in inches	# Lit LED's
4 or less	4
6 or less	3
8 or less	2
10 or less	1

'-----Revision History-----

' 11/25/08 Convert from PIC16F84A to PIC16F88,
' add PIC16F88 oscillator and ANSEL = 0 initializations.

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

conv_to_inches **CON** 15 ' Assigns the value 15 to the
 ' constant conv_to_inches

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

emit **VAR** PORTB.0 ' Pin RB0 assigned the name emit
echo **VAR** PORTB.1 ' Pin RB1 assigned the name echo
dist_raw **VAR WORD** ' Defines dist_raw as a 16 bit
 ' variable
dist_inch **VAR WORD** ' Defines dist_inch as a 16 bit
 ' variable

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

TRISB = %00000010 ' Sets PORTB.1 (echo) as input,
 ' all other PORTB pins as outputs
ANSEL = 0 ' Configure all pins to digital
 ' operation since not using ADC
 ' (Analog to Digital Converter)
OSCCON = \$60 ' Sets the internal oscillator in the

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' 16F88 to 4 MHz

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

start:          ' start label

PULSOUT emit,1      ' Pulse Width:
                   ' Sends a pulse out on pin RB0 (emit)
                   ' for 10 usec. The period,(1) is
                   ' multiplied by the increment for
                   ' a 4 MHz oscillator(10 usec)
                   ' to get a pulse out time of 10 usec.

PULSIN echo,1,dist_raw      ' Measures the pulse width on pin RB1
                             ' (echo) and assigns the reading to the
                             ' variable dist_raw.

dist_inch = (dist_raw/conv_to_inches) ' Converts raw sonar reading
                                         ' to inches.

LCDOUT $FE,1,"Dist.in inch." ' Clears LCD screen, displays
                             ' "Dist. in inch."

LCDOUT $FE,$14,#dist_inch    ' Moves cursor over one space,
                             ' displays value of the variable
                             ' dist_inch

IF dist_inch <= 4 THEN LED4 ' If the distance is equal or less
                             ' than 4 inches, go to LED4 label.

IF dist_inch <= 6 THEN LED3 ' If the distance is equal or less
                             ' than 6 inches, go to LED3 label

IF dist_inch <= 8 THEN LED2 ' See note directly above

IF dist_inch <= 10 THEN LED1 ' See note directly above

PAUSE 10                  ' Pause 10 milliseconds

GOTO start

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LED4:                                ' LED4 label

    PORTB = %11110000                ' Set RB4,5,6,7 to HIGH (+5v) and
                                     ' RB0,1,2,3 to LOW (0v).

    GOTO bottom                      ' Go to bottom label

LED3:

    PORTB = %01110000                ' Set RB4,5,6 to HIGH (+5v) and
                                     ' RB0,1,2,3,7 to LOW (0v).

    GOTO bottom                      ' Go to bottom label

LED2:

    PORTB = %00110000                ' Set RB4,5 to HIGH (+5v) and
                                     ' RB0,1,2,3,6,7 to LOW (0v).

    GOTO bottom                      ' Go to bottom label

LED1:

    PORTB = %00010000                ' Set RB4 to HIGH (+5v) and
                                     ' RB0,1,2,3,5,6,7 to LOW (0v).

    GOTO bottom                      ' Go to bottom label

bottom:

    PAUSE 10                         ' Pause 10 milliseconds

    PORTB = %00000000                ' Set all PORTB pins to LOW (0v).

    GOTO start

    END
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