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'-----Title-----
' File.....16F877A_step_mot1.pbp
' Started....2/14/09
' Microcontroller used:  Microchip Technology 16F877A
'                          microchip.com
' PicBasic Pro Code:  micro-Engineering Labs, Inc.
'                          melabs.com
' Stepper Motor Used:  Jameco #237623
' (#237623 - 4.8V, 1500mA, 1.8 Degree Step Angle or 200 Steps/Revolution)

'-----Program Description-----
' Program drives stepper motor to rotate, rather slowly.

'-----Schematic-----
' See schematic at:
' http://cornerstonerobotics.org/schematics/pic\_16f877a\_step\_mot1.pdf

'-----Related Lesson-----
' step_mot1.pbp (the 16F88 program) is used in the lesson
' Stepper Motor Control with a PIC at:
' http://www.cornerstonerobotics.org/curriculum/lessons\_year2/erii\_stepper\_motor.pdf
' Lesson also includes a section on how to figure out how to hook
' up a stepper motor with six leads when a data sheet for the
' motor is unavailable.

'-----Comments-----
' WITH THE PIC16F877A, BE CERTAIN TO HAVE SEPARATE POWER
' SOURCES FOR THE PIC AND THE STEPPER MOTOR.  MAKE SURE
' TO HAVE A COMMON GROUND BETWEEN THE PIC AND MOTOR.

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

'-----PIC Connections-----
'
'      PIC16F877A Pin          Wiring
'      -----
'      RB0                    Stepper Motor Control Wire 1
'      RB1                    Stepper Motor Control Wire 2
'      RB2                    Stepper Motor Control Wire 3
'      RB3                    Stepper Motor Control Wire 4
'      Vdd                    +5 V
'      Vss                    Ground
'      MCLR                   4.7K Resistor to +5 V

'-----Variables-----
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Delay  VAR    WORD  ' WORD for variable Delay

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

TRISB = %00000000      ' Sets all PortB pins to output

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

Delay = 50              ' Sets Delay variable to 50(msec)
                        ' Delay changes the rotational speed
                        ' of the motor. Check for the minimum
                        ' Delay value of your motor.
                        '
                        '   Delay Value      Approx. No-load Current
                        '   -----      Jameco #237623 Stepper Motor
                        '   -----
                        '   250          0.90 A
                        '   100          0.86 A
                        '   50           0.83 A
                        '   20           0.70 A
                        '   10           0.53 A
                        '   6            0.46 A
                        '   5            0.36 A
                        '   4            0.12 A
                        '   3            0.17 A
                        '   2            Motor Stops Operating
                        '                   Properly

loop:

PORTB = 8              ' Equivalent to PORTB = %00001000
                        ' in binary. Makes pin RB3 HIGH and all
                        ' other PORTB pins LOW. This sends a
                        ' HIGH signal to the NPN transistor
                        ' connected to pin RB3. The NPN transistor
                        ' grounds one end of the coil connected
                        ' to it, activaing the coil.
                        ' All other coils are off.

PAUSE Delay            ' PAUSE in milli-seconds so
                        ' PAUSE Delay is a pause of 50(ms)

PORTB = 4              ' Equivalent to PORTB = %00000100
                        ' in binary. Makes pin RB2 HIGH and all
                        ' other PORTB pins LOW. This sends a
                        ' HIGH signal to the NPN transistor
                        ' connected to pin RB2. The NPN transistor
                        ' grounds one end of the coil connected
                        ' to it, activaing the coil.
                        ' All other coils are off.

PAUSE Delay

PORTB = 2              ' Equivalent to PORTB = %00000010
                        ' in binary. Makes pin RB1 HIGH and all
                        ' other PORTB pins LOW. This sends a
                        ' HIGH signal to the NPN transistor

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                                ' connected to pin RB1.
PAUSE Delay
PORTB = 1                        ' Equivalent to PORTB = %00000001
                                ' in binary. Makes pin RB0 HIGH and all
                                ' other PORTB pins LOW. This sends a
                                ' HIGH signal to the NPN transistor
                                ' connected to pin RB0.
PAUSE Delay
GOTO loop                       ' Start process over again
END
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