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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

start:

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 start                     ' Start process over again
END
```