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'-----Title-----
' File.....16F877A_step_mot_half_step.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 with 400 steps per revolution.

'-----Schematic-----
' Use the same schematic as 16F877A_step_mot1.pbp.  See schematic at:
' http://cornerstonerobotics.org/schematics/pic_16f877a_step_mot1.pdf

'-----Related Lesson-----
' See 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-----
'
'      Delay  VAR  WORD  ' WORD for variable Delay
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'-----Initialization-----'

TRISB = %00000000 *' Sets all PortB pins to output*

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

Delay = 3 *' Sets Delay varaiable to 3(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
 ' -----
 ' 20 1.23 A
 ' 10 1.16 A
 ' 6 0.98 A
 ' 5 1.00 A
 ' 4 0.92 A
 ' 3 0.70 A
 ' 2 0.21 A
 ' 1 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 3(ms)

PORTB = 12 *' Equivalent to PORTB = %00001100*
 ' in binary. Makes pin RB3 and RB2 HIGH and
 ' all other PORTB pins LOW. This sends a
 ' HIGH signal to the NPN transistors
 ' connected to pins RB3 & RB2. The NPN
 ' transistors ground the ends of the coils
 ' connected to them, activaing those 2 coils.
 ' All other coils are off.

PAUSE Delay

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

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' to it, activaing the coil.
' All other coils are off.

PAUSE Delay

PORTB = 6      ' Equivalent to PORTB = %00000110
                ' in binary. Makes pin RB2 and RB1 HIGH and
                ' all other PORTB pins LOW. This sends a
                ' HIGH signal to the NPN transistors
                ' connected to pins RB2 & RB1. The NPN
                ' transistors ground the ends of the coils
                ' connected to them, activaing those 2 coils.
                ' 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
                ' connected to pin RB1.

PAUSE Delay

PORTB = 3      ' Equivalent to PORTB = %00000011
                ' in binary. Makes pin RB1 and RB0 HIGH and
                ' all other PORTB pins LOW. This sends a
                ' HIGH signal to the NPN transistors
                ' connected to pins RB1 & RB0.

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

PORTB = 9      ' Equivalent to PORTB = %00001001
                ' in binary. Makes pin RB3 and RB0 HIGH and
                ' all other PORTB pins LOW. This sends a
                ' HIGH signal to the NPN transistors
                ' connected to pins RB3 & RB0.

PAUSE Delay

GOTO start    ' Start process over again

END
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