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//* Sumner sketch to control a stepper motor for a turntable with TB6600 stepper motor
driver and Arduino without a library
   /// 1st Arduino

 // Define stepper motor connections and buttons:
    const int dirPin = 2 ;        // To Stepper Motor (DIR+)
    const int stepPin = 3 ;       // To Stepper Motor (PUL+)
    const int buttonPin1 = 4 ;    // To hand controller clockwise roation (Blue Wire)
    const int buttonPin2 = 5 ;    // To hand controller counter-clockwise roation
(Yellow Wire)
    const int signalPin2 = 7;     // output pin 7 to 2nd Arduino LED pulse pin 5
    const int Pin8 = 8;           // From hand controller starts indexing sequence.
(Purple Wire)
    const int Pin9 = 9;           // Input from Hall Effect.
    const int distance = 400;     // Make this less or more to set the final rotation
place.
        // A0                  // Reads the POT for rotation speed (Brown Wire)
 // variables will change:

    int buttonState1 = 0;         // variable for reading the pushbutton status
    int buttonState2 = 0;         // variable for reading the pushbutton status
    int Stop = HIGH;
    int Start = LOW;
    int Rotate = 0;
    int i = 0;

 void setup() {
    Serial.begin(9600);
    pinMode(stepPin, OUTPUT);     // Declare pins as output:
    pinMode(dirPin, OUTPUT);      // Declare pins as output:
    pinMode(signalPin2, OUTPUT);  // Declare pins as output:

    pinMode(buttonPin1, INPUT);   // initialize the pushbutton pin as an input:
    pinMode(buttonPin2, INPUT);   // initialize the pushbutton pin as an input:

    pinMode(Pin8, INPUT);         //  Input from hand control
    pinMode(Pin9, INPUT);         //  Input from Hall Effect

    Stop = HIGH;
    Start = LOW;
    Rotate = 0;


 // Set initial state of stepper motor
    digitalWrite(stepPin, LOW);  // Set stepping off
    digitalWrite(dirPin, LOW);  // Set the spinning direction CW:
    digitalWrite (signalPin2, LOW);  // Set LED pulse signal to 2nd Arduino low
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    }

 void loop(){

  //// Index Track

  Start = digitalRead (Pin8);
    if (Start == HIGH){
    Rotate = 1;
      }
    if (Rotate == 1){
     Stop = digitalRead (Pin9);  //Reads Pin9, Hall Effect, It goes low when it gets
to the magnet.
     digitalWrite(dirPin, LOW); // Set the spinning direction Clockwise
     digitalWrite(stepPin, HIGH);
       delayMicroseconds(500);
       digitalWrite(stepPin, LOW);
       delayMicroseconds(500);

    if (Stop == LOW) {  // Hall effect is now low and turn table stops
      for(int i = 0; i<distance; i++) {
      digitalWrite(stepPin, HIGH);
      delayMicroseconds(5000);
      digitalWrite(stepPin, LOW);
      delayMicroseconds(5000);
      }
       Rotate = 0;
        }
      }

  //// Read Button for clockwise rotation and rotate if it is pressed.

    buttonState1 = digitalRead(buttonPin1);  // read the state of the forward
pushbutton value:

       digitalWrite(signalPin2, LOW);
       if (buttonState1 == HIGH){  // check if the pushbutton is pressed.
       digitalWrite(dirPin, LOW);} // Set the spinning direction Clockwise

  //// Read Button for counter-clockwise rotation and rotate if it is pressed.


    buttonState2 = digitalRead(buttonPin2);  // read the state of the reverse
pushbutton value:

      if (buttonState2 == HIGH){  // check if the pushbutton is pressed.
      digitalWrite(dirPin, HIGH);}  // Set the spinning direction counter-clockwise.}
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   if (buttonState1 == HIGH || buttonState2 == HIGH ) {

     digitalWrite(signalPin2, HIGH);  // Send LED pulse signal to 2nd Arduino high

   int x = ( analogRead(A0) );  //Reads the analog value on pin A0 into x.  Following
code determines rotation speed. Set the delays for speed desired.

     if (x > 854) {
       digitalWrite(stepPin, HIGH);
       delayMicroseconds(500);
       digitalWrite(stepPin, LOW);
       delayMicroseconds(500);}

     else if (x > 683) {
       digitalWrite(stepPin, HIGH);
       delayMicroseconds(1000);
       digitalWrite(stepPin, LOW);
       delayMicroseconds(1000);}

     else if (x > 513) {
       digitalWrite(stepPin, HIGH);
       delayMicroseconds(2000);
       digitalWrite(stepPin, LOW);
       delayMicroseconds(2000);}

     else if (x > 400) {
       digitalWrite(stepPin, HIGH);
       delayMicroseconds(3000);
       digitalWrite(stepPin, LOW);
       delayMicroseconds(3000);}

     else if (x > 300) {
       digitalWrite(stepPin, HIGH);
       delayMicroseconds(5000);
       digitalWrite(stepPin, LOW);
       delayMicroseconds(5000);}

     else if (x > 100) {
       digitalWrite(stepPin, HIGH);
       delayMicroseconds(16000);
       digitalWrite(stepPin, LOW);
       delayMicroseconds(16000);}

     else {digitalWrite(stepPin, LOW);}}

   else { digitalWrite(signalPin2, LOW); } /// Skip past the rotation speed
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}
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