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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
        }

 void loop(){

   //// Index Track
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  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.}

    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);
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      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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