Video about what this is: https://youtu.be/uA70TDW96uE

Basically, we needed to stress test some audio cables for a prototyping project and we had to get going with this before our industrial grade machine arrived. Our engineering staff knocked this tester together in the course of a day. The Servo motor came from either an RC plane or car.

"Trumeter 7000" Digital Counter - 28€

https://www.conrad.at/de/trumeter-7000-elektronischer-miniaturimpulszaehler-einbaumasse-294-x-22-mm-127419.html

Arduino Uno 22-25€

https://at.rs-online.com/web/p/products/7154081/?grossPrice=Y&cm_mmc=AT-PLA-DS3A-_-google-_-PLA_AT_DE_Halbleiter-_-Entwicklungskits%7CEntwicklungskits_Prozessor_And_Mikrocontroller-_-PRODUCT+GROUP&matchtype=&gclid=EAIaIQobChMI38nLreGb2wIVC54bCh0npg4iEAQYASABEgLsw_D_BwE&gclsrc=aw.ds

DS-8203 MG Digital-Servo

https://www.conrad.at/de/reely-spezial-servo-ds-8203-mg-digital-servo-getriebe-material-metall-stecksystem-jr-1365553.html

Austrian Audio Engineering Staff – (Priceless They wanted me to write that!)

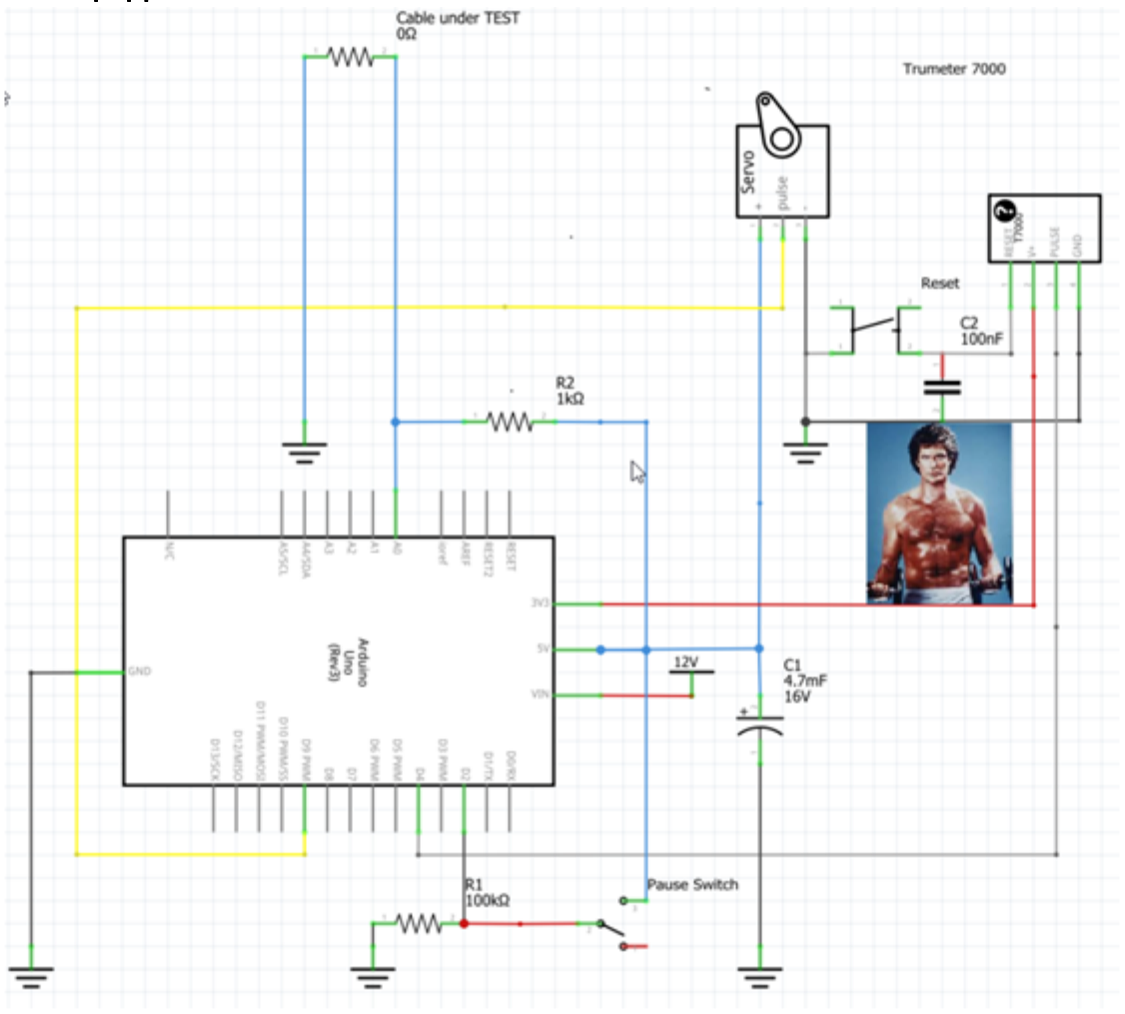
Oh, yeah: Source Code

```
/* Sweep
  by RIRO & DAWO & ALKA

  V6
  ADC Schwellwert = Kabelbruch
  Zeigt ADC Wert bei 0°, 180°
  Meldung bei Kabelbruch
  Läuft weiter bei Kabel = OK
  Pause bei 90° (kein Kabelknick)
  Zeigt Pausenzeit

*/

#include <Servo.h>
#include <SPI.h>
#include <SD.h>

Servo myservo;  // create servo object to control a servo

enum e_State {
  IDLE = 0,  PAUSE,  RUN, BROKEN
} myState;

const int chipSelect = 4;
int ledPin = 13;            // LED connected to digital pin 13
int countPin = 4;           // count output is pin 4
int buttonPin = 2;          // button connected to pin 2
int buttonval = 0;          // variable to store the read value
int pos = 0;                // variable to store the servo position
int sensorPin = A0;
int sensorValue = 1023;
int threshold = 10;         // ADC Values 0-1023 (1023 = 5VDC) => with 1k pull up => threshold 10 =
10R
int timecount = 0;          // Pause time


void cableBroken() {
  Serial.println("");
  Serial.print(" - !!!Kabel gebrochen!!! -  A0 ADC Wert: ");
  Serial.println(sensorValue);
  Serial.println("");
}


void countUp() {
  static unsigned long counter = 1;  // 32bit only positive
  digitalWrite(countPin, HIGH);
  delay (5);                         // 5ms High signal
  digitalWrite(countPin, LOW);
  Serial.print("Counter: ");
  Serial.println(counter++);
}


void ADCValue() {
  Serial.print("  A0 ADC Wert: ");
  Serial.println(sensorValue);       // ADC value
}


void servopos(int endpos) {
  bool changed = false;
  if (pos < endpos) {
    for (; pos < endpos; pos += 3) {    // counts up in 3° steps (speed = 180°/3°*20ms = 1.2sec)
      myservo.write(pos);              // tell servo to go to position in variable 'pos'
      delay(20);                       // 20ms delay for every 3° step (20ms according to Servo Spec)
    }
    changed = true;
  }
  if (pos > endpos) {
    for (; pos > endpos; pos -= 3) {
      myservo.write(pos);
      delay(20);
    }
    changed = true;
  }

  if (changed == true) {
    Serial.print(pos);
    Serial.print("°");
    if (pos == 90) {
      Serial.print(" - Pause - ");
    }
  }
}

void setup() {
 pinMode(ledPin, OUTPUT);     // sets the digital ledPin as output
  pinMode(countPin, OUTPUT);   // sets the countPin as output
  pinMode(buttonPin, INPUT);   // button pin set as input
  digitalWrite(countPin, LOW);
  myservo.attach(9, 650, 2400); // attaches the servo signal on pin 9, min, max = shortest, longest
pulse with (µs) = physical end position for 0°, 180°
  Serial.begin(9600) ;
  Serial.println("Hello World");
  myState = e_State::RUN;
}

void loop() {
```

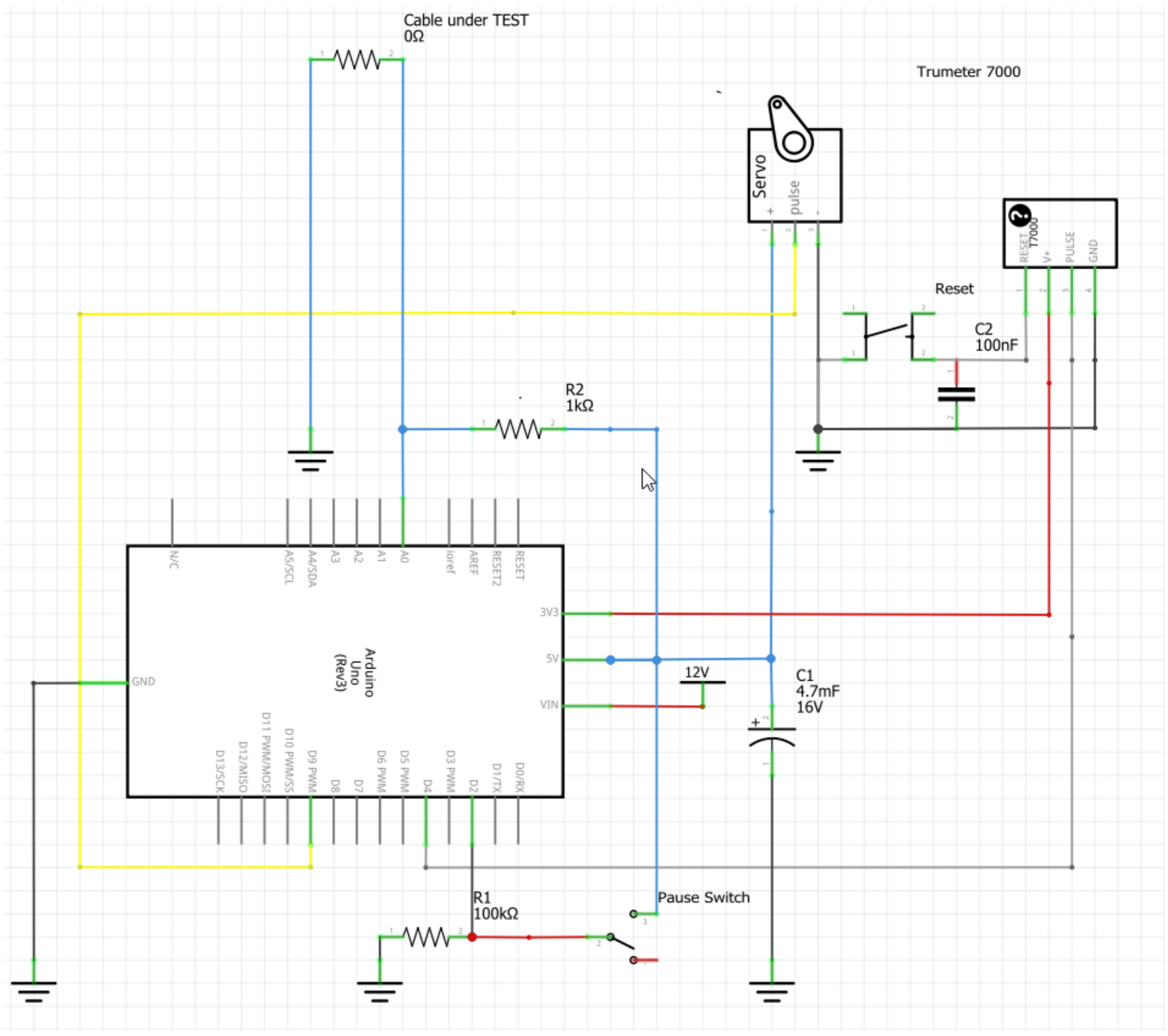
```
switch (myState) {

  case e_State::IDLE:
    sensorValue = analogRead(sensorPin);// A0 einlesen
    if (sensorValue <= threshold) {     // Wenn Kabel ok => Servobewegung
      myState = e_State::RUN;
    }
    break;

  case e_State::BROKEN:
    cableBroken();
    myState = e_State::IDLE;
    break;

  case e_State::RUN:
    buttonval = digitalRead(buttonPin);
    if (buttonval == HIGH) {
      myState = e_State::PAUSE;
      break;
    }
    servopos(180);
    sensorValue = analogRead(sensorPin);// A0 einlesen
    ADCValue();                         // Wert ausgeben
    if (sensorValue > threshold) {      // Wenn Kabel ok => Servobewegung
      myState = e_State::BROKEN;
      break;
    }
    servopos(0);
    sensorValue = analogRead(sensorPin);
    ADCValue();
    if (sensorValue > threshold) {
      myState = e_State::BROKEN;
      break;
    }
    countUp();
    break;

  case e_State::PAUSE:
    servopos(90);
    delay(1000);
    timecount++;
    buttonval = digitalRead(buttonPin);
    if (buttonval == LOW) {
      Serial.print("Dauer: ");
      Serial.print(timecount);
      Serial.println("s");
      Serial.println("");
      timecount = 0;
      myState = e_State::RUN;
    }
    break;
  }
}
```

Schematics: I dunno. The Engineers sent me two sets… :D

Hoff Equipped



The following one actually works:


Cable under TEST
0Ω
Trumeter 7000
Servo
pulse
T7000
RESET
V+
PULSE
GND
Reset
C2
100nF
R2
1kΩ
N/C
A5/SCL
A4/SDA
A3
A2
A1
A0
ioref
AREF
RESET2
RESET
3V3
5V
VIN
GND
Arduino
Uno
(Rev3)
12V
C1
4.7mF
16V
D13/SCK
D12/MISO
D11 PWM/MOSI
D10 PWM/SS
D9 PWM
D8
D7
D6 PWM
D5 PWM
D4
D3 PWM
D2
D1/TX
D0/RX
R1
100kΩ
Pause Switch