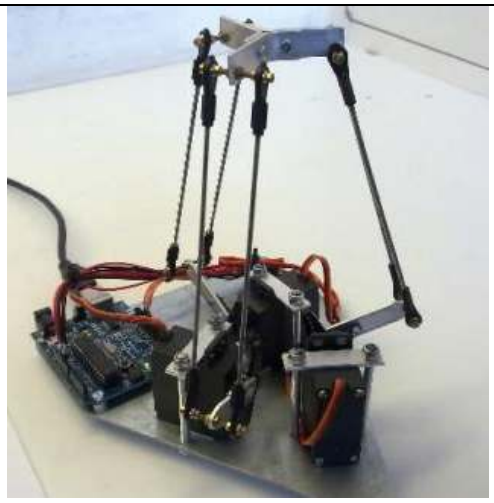
Edushield – 2-D Delta controlled by stepping motors

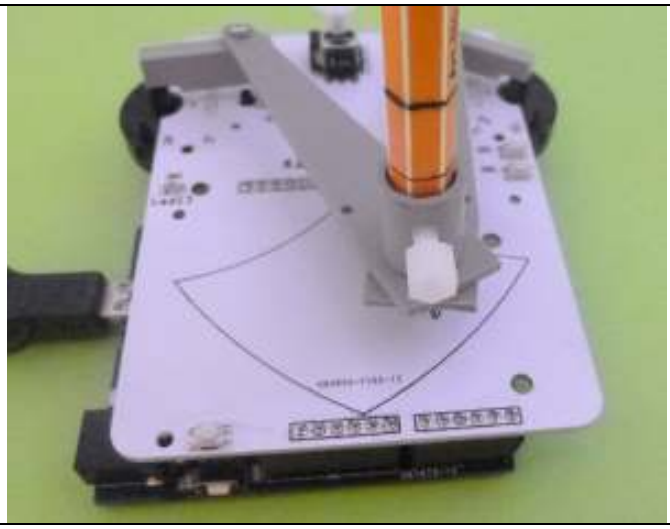
The Delta robot, invented by prof Clavel at the EPFL, Switzerland, is cute and fast.



You can build one and control it with your Arduino. Search on web.

The Edu-shield Delta 2D is a good introduction to stepping motors and real time coordination of movement. Its Kidule implementation has been successful in technical schools.
www.didel.com/kidules/CKiDelta.pdf (French)

Two low power stepping motorsVid26.05 (search on Google "Vid26") are used. These instrumentation motors are used on car dashboards for showing the speed and the time..Coils' resistance is ~1k Ohm, allowing a direct control from the microcontroller outputs.

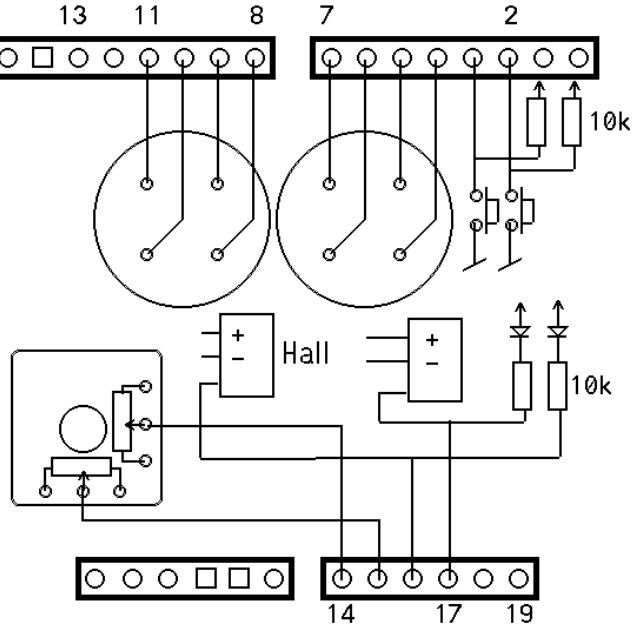


Hall sensors provide initial position for the motors.
2 push-button are convenient to start/stop the movement when adjusting the pen.
Drawing on the PCB is possible with water markers, dia 8.4mm max.

The joystick is an option that may not stay if no didactic application.

To be continued, extension of the french document

test EduDel2.ino Change phase by hand to change drawing.



```
//EduDel2.ino  Two motors
// Les deux moteurs tournent en sens contraire
byte etat[6]={0x71,0x69,0xE8,0x8E,0x96,0x17};
// les deux moteurs tournent dans le même sens
//byte etat[6]={0x77,0x66,0xEE,0x88,0x99,0x11};

void setup()  {
  DDRB   = 0b1011111;    //
  DDRC   = 0b0000000;    // bits 0-3 in
  DDRD  |= 0b11110000 ;  // bits 2 3 in
}

void WriteK2 (byte kk)  {
  PORTB  |= (kk & 0x0F) ;      // copie les 4 bits
  PORTB  &= (kk | ~0x0F) ;
  PORTD  |= (kk & 0xF0);   //copie les uns
  PORTD  &= (kk | ~0xF0);  // copie les zéros
}

void loop() {
  for (byte i=0; i<6; i++) {
    WriteK2 (etat[i]) ;
    delayMicroseconds(2000); // max vit 1000 à 3.5V
  }
}
                                                                    }
```