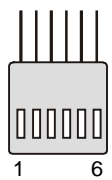


Stepper Motor Driver

A stepper motor has four coils. The direction of rotation (clockwise or anti-clockwise) depends on the order in which the currents supplied to the coils are switched on. If you use the motors type 55SI-25 DAYA, having a connector as shown below,



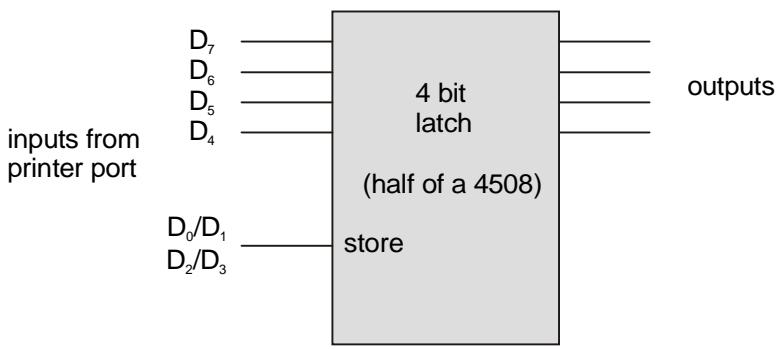
then, 2 1 3 4 will turn the motor clockwise and
1 2 4 3 will turn the motor anti-clockwise

The numbers here refer to the numbers of the sockets on the motor connector. Sockets 5 and 6 are both connected to the positive of the motor supply. The motor driver is connected to the *parallel port* of a computer.

A program is required to run the motors. The program simply sends a series of numbers to the parallel port: 32 16 64 128, to turn a motor clockwise and 16 32 128 64 to turn a motor anti-clockwise. These numbers are sent using data lines 4 to 7; data lines 0 to 3 are used to select which motor you want to activate.

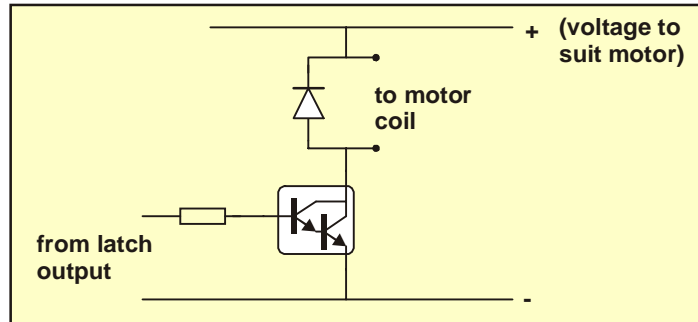
The computer runs much too fast for the motors so the output from the port is stored in a "latch". The latch inputs are only transferred to the outputs if the "store" pin is high (at 5v). The store input is connected to data line 0 or 1 or 2 or 3 of the port so the computer can run one motor by putting bit 0 = 1 (data line 0 at 5v), a second motor by putting bit 1 = 1 (data line 0 at 5v) etc. So this method could be used to control up to four motors.

The basic idea is illustrated below



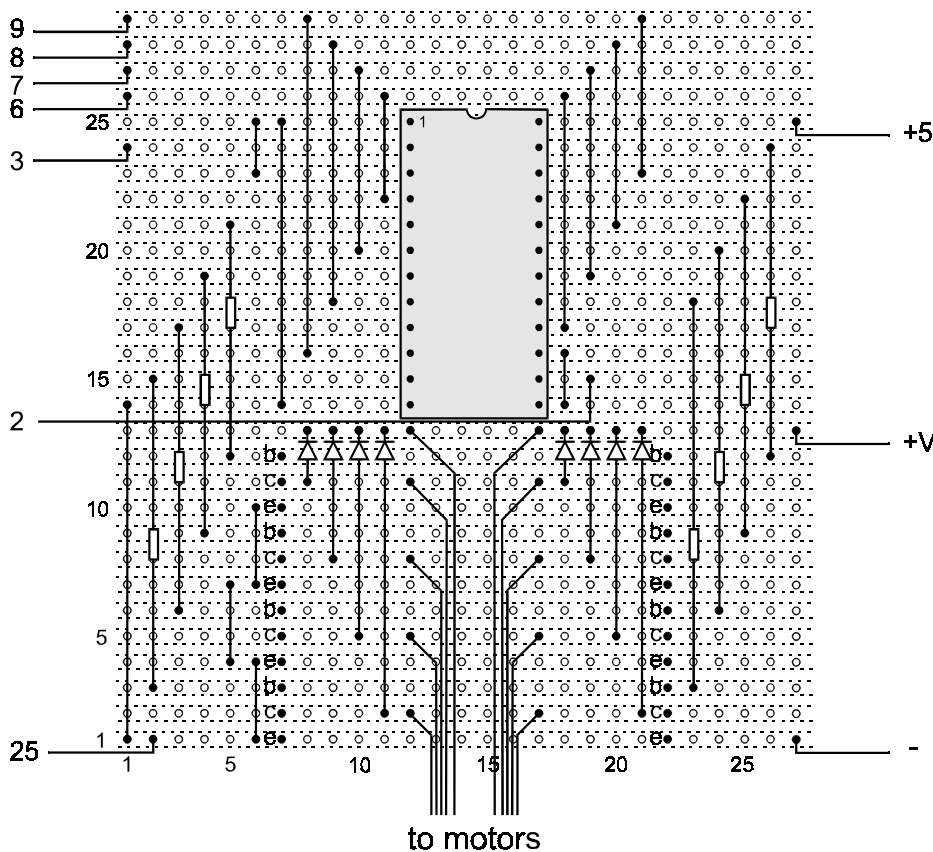
The outputs of the latch are used to switch “Darlington” high gain, high current transistors (type BD679, BD683 etc). This is necessary because the motors need currents of about 300mA to run correctly.

Circuit of one coil driver (four needed for each motor)

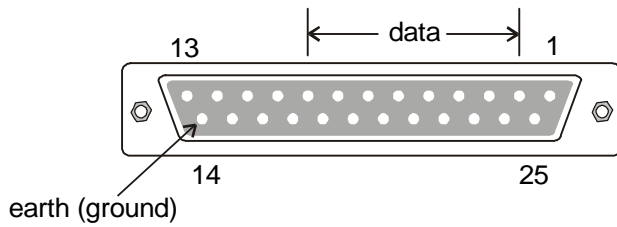
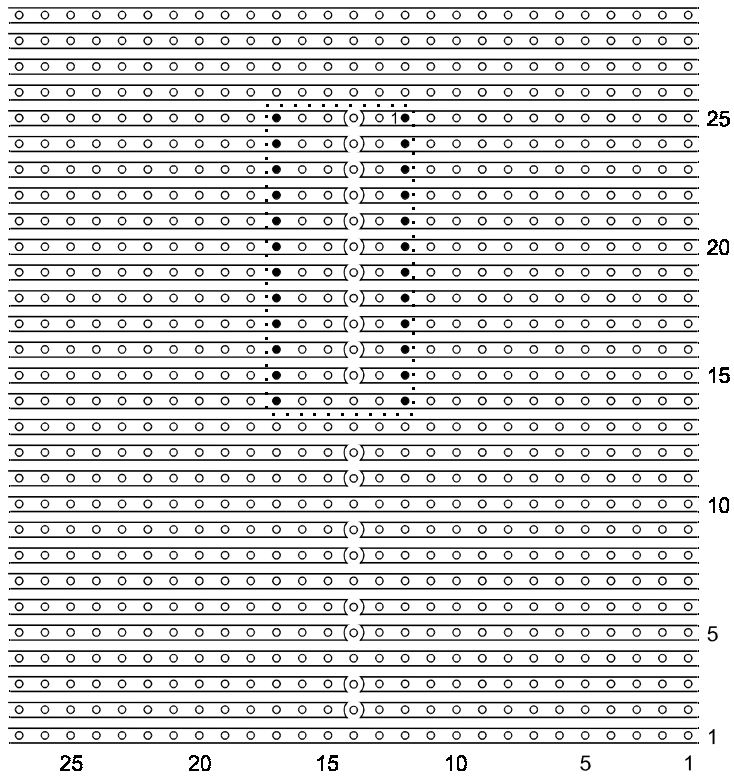


N.B. Some Darlington transistors also have a protection diode (not shown in the diagram). The resistor should be about 4k7.

Vero for two-motor driver



The numbers on the left of this vero diagram refer to the numbers of the pins on the computer printer port, shown below.



Printer Port

The data outputs are pins 2 to 9 (pin 2 = bit 0 pin 9 = bit 7)