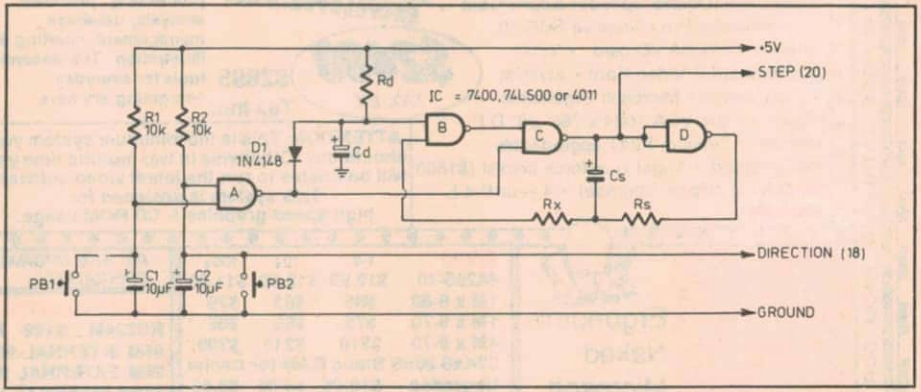
Disk drive stepper motor driver

A retired floppy disk drive, especially a sturdy 5.25 inch full height type, offers the chance to experiment with a stepper motor without having to worry about how to generate the waveforms needed by the stepper. The DC motor and data circuitry can be defunct; only the controller ICs and the stepper motor need be functional.

Remove the controller board and stepper from the drive. Note the connector position if reconnection is likely. A 5V and 12V power supply is needed and feeds the four-pin power connector. On the 34-pin edge connector, the odd numbers are on one side and are all connected to ground. Pins 1 and 2 are closer to the polarising notch of the connector. Select drive position 1 on the drive ID jumpers or DIP switches, then connect pin 10 of the edge connector to ground. Pin 18 determines the stepper motor direction, and pin 20 should be sent a negative going edge for each step.



logic type	Rs	Cs	Rx	Rd	Cd
TTL	1.5k	47µF	0	22k	470µF
TTL LS	6.8k	10µF	1k	100k	100µF
CMOS	680k	100nF	0	330k	10µF

The circuit shown here simplifies control of the stepper. One button causes the motor to step up and the other makes it step down. Additionally, if a button is held down for more than a second, the stepper autorepeats. Gates B and D form a low frequency oscillator. Rs and Cs control the stepping frequency, while Cd (also Rd for CMOS) determine the delay between single and repeat stepping.

The table shows component values for different types of logic gates. For TTL vary the capacitances, for CMOS change the resistances. Uses are up to your imagination and could include motorised curtains, robotics and so on.

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