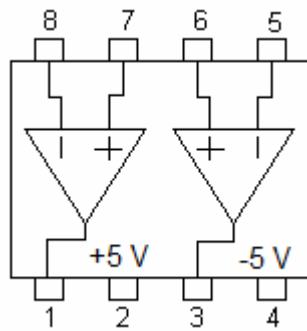
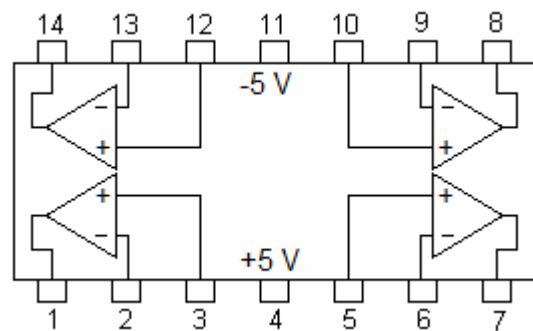


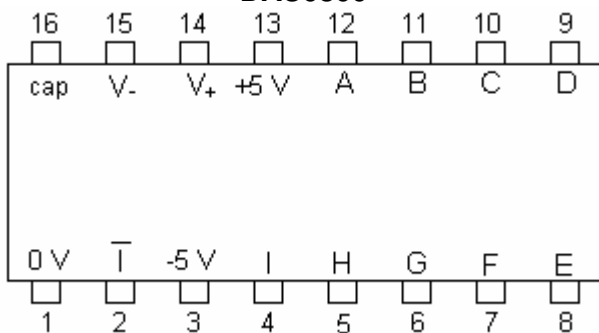
L272M



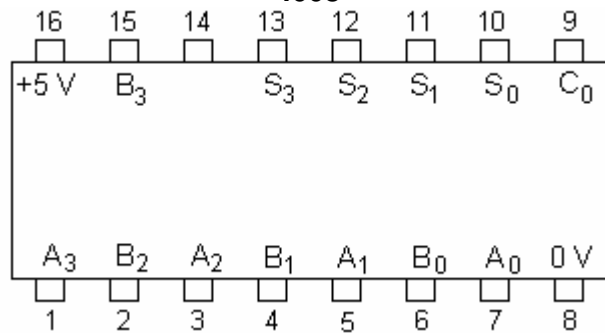
TL084



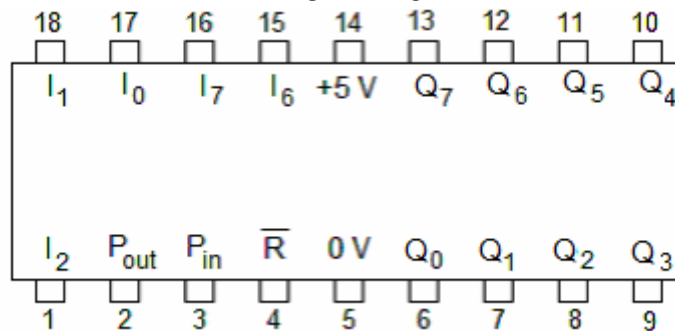
DAC0800



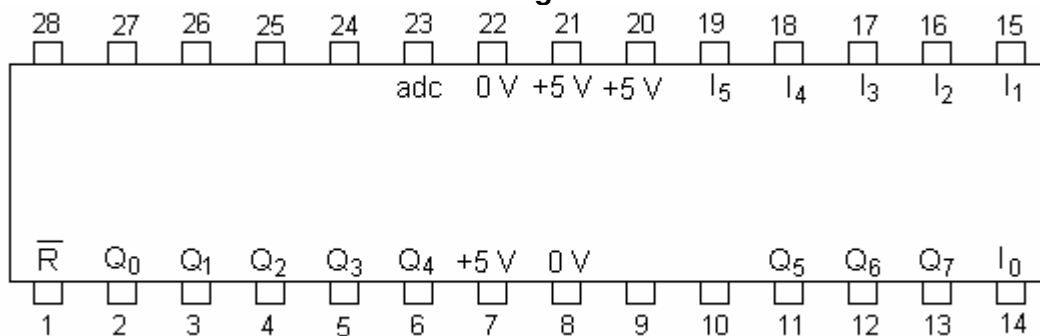
4008



PICAXE-18



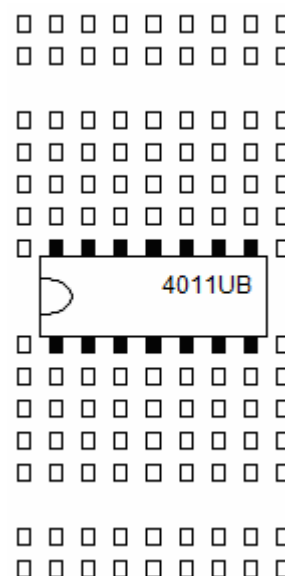
ATmega48



Using Integrated Circuits

When using an integrated circuit on breadboard you should always

- insert it across the central gap
- have the dent on the left, so that pin 1 is bottom left
- connect the power supply first with colour coded wire
- use red wire for +5 V, green for 0 V and black for -5 V
- ensure that unused logic system inputs are held high or low
- ensure that there is a sink for leakage currents at op-amp inputs
- leave unused outputs to do what they want
- check that it doesn't get hot when the power supply goes on



Integrated Circuit	Notes
4001	Four independent two-input NOR gates.
4011	Four independent two-input NAND gates.
4013	Two independent D-type flip-flops.
4014	Eight-bit PISO shift register. Hold PL high to load the word at D _n on a rising edge at CK. Hold PL low for serial output at SO on rising edges at CK.
4015	Two independent four-bit SIPO registers. R is an active-high reset pin.
4023	Three independent three-input NAND gates.
4024	One falling-edge triggered seven-bit counter.
4042	Four latches with a common enable input EN. P must be held high for EN to be active-high.
4051	Eight input multiplexer which can also function as a demultiplexer. Input T is connected to output Q _N where N is the binary number CBA. The other outputs float, so pull-up or pull-down resistors are required. For analogue operation with negative voltages, hold pin 7 at -5 V.
4066	Four independent analogue switches. Switch resistance drops from infinity to at least 0.5 kΩ when the enable pin goes high.
4069	Six independent NOT gates.
4070	Four independent two-input EOR gates.
4071	Four independent two-input OR gates.
4081	Four independent two-input AND gates.

Integrated Circuit	Notes
4511	BCD-to-seven segment LED decoder. The latched outputs source current. The state of the inputs DCBA determines the pattern at the outputs gfedcba. \overline{LT} sets gfedcba when it is low, so it is high in normal use. \overline{BL} resets gfedcba when it is low, so it is high in normal use. \overline{EN} freezes gfedcba when it is high, so it is low in normal use.
40106	Six independent Schmitt Trigger NOT gates. Trip points at 2.2 V and 2.8 V.
TL084	Four independent op-amps. Each output can source or sink up to 40 mA.
L272M	Two independent op-amps. Each output can source or sink up to 1 A.
DAC0800	Eight-bit DAC. Currents at I and I-bar depend on word at HGFEDCBA.
PICAXE-18	Microcontroller with five inputs and eight outputs. \overline{R} should be pulled high with 4.7 k Ω in normal use. Hold the programming pin P _{in} low with 10k Ω . There is an analogue-to-digital converter at pin D ₀ .
ATMega48	Microcontroller with six inputs, eight outputs and one adc, depending on header file. \overline{R} should be pulled high with 4.7 k Ω in normal use.