Pinouts

The two integrated circuits we will use are 14-pin TTL chips. The 7400N is four NAND gates on a chip and the 7432N provides four OR gates. This diagram shows the way the gates are arranged, all that is needed is to connect the appropriate pins together. There is a notch on the top of the chip to show which way up to use it. Remember also that you must supply power through pins 7 and 14 to make the chips work
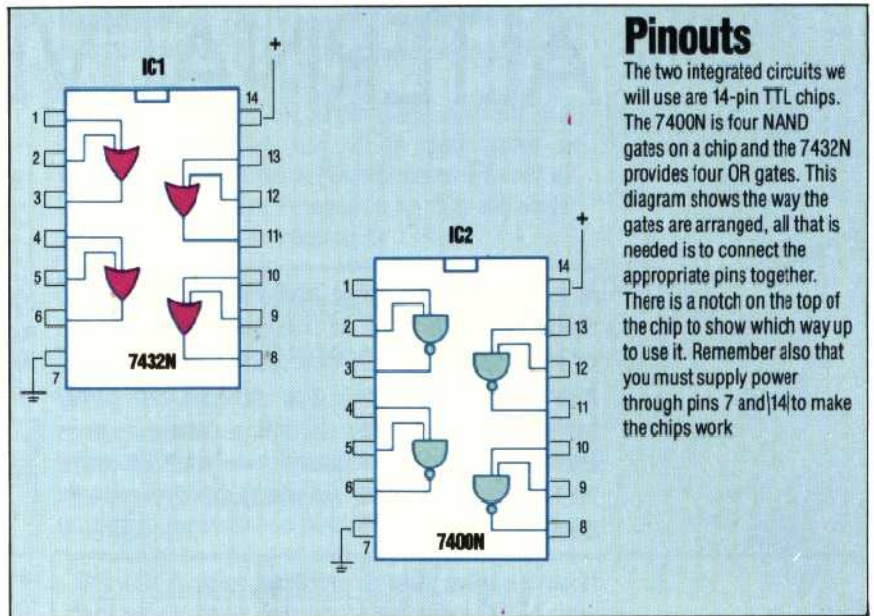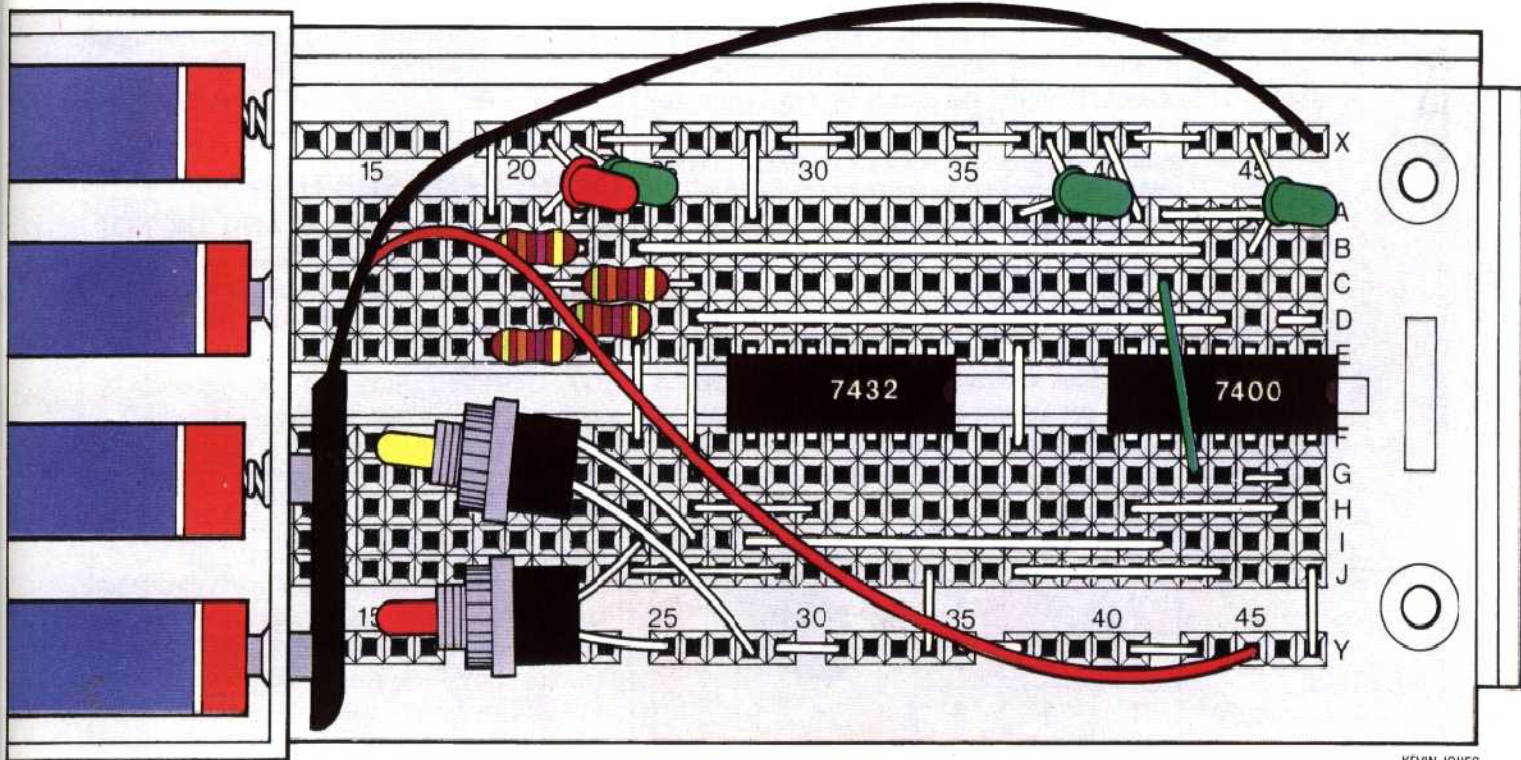
What You Need

4 500-ohm, one-quarter watt resistors
4 LEDs
2 push-to-make switches
1 7400N integrated circuit
1 7432N integrated circuit
4 HP7 or equivalent batteries
1 battery holder
1 battery clip
1 breadboard (Experimentor 300 or similar)
Short lengths of wire

KEVIN JONES

Across The Board

Once the electronic circuit is designed, the next step is the process of arranging the components on a breadboard. You can buy planning pads for this or simply use a photocopy of an empty board! It is best to keep the breadboard looking as much like the original circuit as possible, as the neater the design, the easier it is to build. Copy this precisely, as all the components are in the correct position
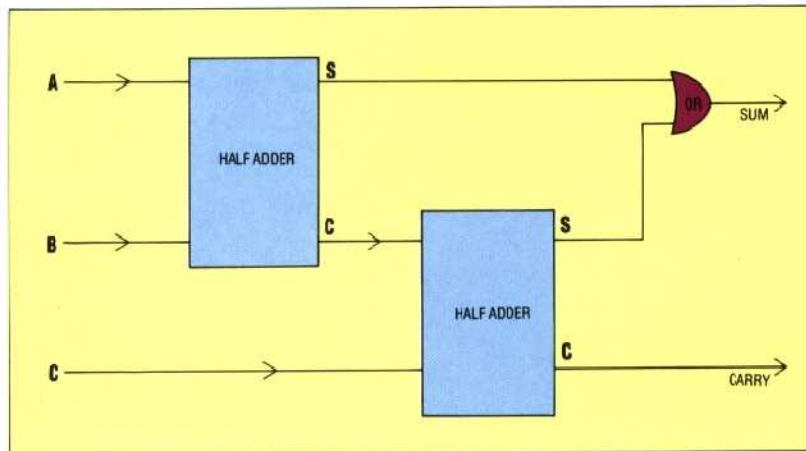
Full Adder

As an exercise, you might like to try extending your half adder circuit to a full adder. This circuit not only adds two bits together, but also adds a carry from any previous bit position. A series of full adders can add complete binary words. The simplest way to create a full adder is to build two half adders as shown here. The sum signal from the first half adder must replace one of the input switches on the second half adder. The carry output from the first adder must be ORed with the carry output from the second adder to produce the signal for the carry LED