

Electricity and magnetism

Quick circuit boards

A versatile assembly for investigating electric circuits

You will need...

- ✓ board (preferably covered in white melamine) 12 cm × 15 cm
- ✓ 4 nails (4 cm)
- ✓ 4 paper clips
- ✓ 4 drawing pins
- ✓ insulated wire
- ✓ soldering facility

Background:

This apparatus was developed to enable students to assemble, investigate and modify electric circuits quickly and easily. The boards are stackable and durable. (The ones shown here have been in use for over twenty years.)

Follow these steps:

1. The measurements are not critical. The pairs of paper clips are used to hold circuit components temporarily in place. A suitable gap is 3 cm.
2. The drawing pins are inserted into the board and the heads of the paper clips are soldered to the heads of the drawing pins. This can be tricky and requires three hands. For best results, and for ease of assembly, the heads of the pins and clips should be tinned with solder in advance.



3. Some components will need to have short wires added to them so that they can be easily inserted.
4. The two extra nails facilitate stacking.

So what happened?

A great variety of series circuits can be assembled using one board. It is best to use a pair of boards when investigating parallel circuits.

What next?

1. A useful transistor version can be assembled in a similar way; this requires nine drawing pins and six paper clips. A suitable NPN transistor is ZTX300; use a 2k2 resistor on its base.
2. Make permanent versions of the more important demonstration circuits.

