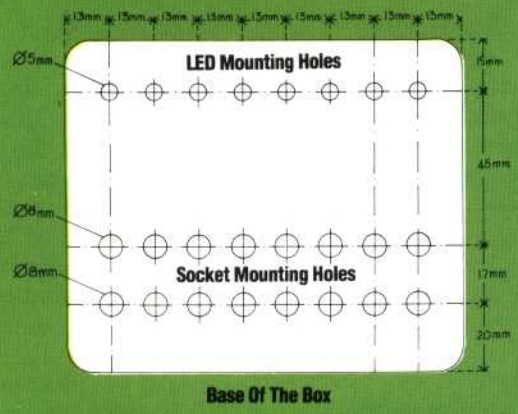
Drilling The Box



The LEDs and black and red sockets are mounted in the base of the box as shown in the template. The plastic of the box is soft and accepts a drill easily, but, to prevent skidding and scratches, cover its face with strips of masking tape, then mark out the drill holes. Start the holes with a bradawl or fine drill, then drill the holes — LED holes 4mm, sockets 8mm in diameter

The Naming Of Parts

To construct the interface unit you will need the parts listed here. We give the Maplin part numbers, but you may get them (or reasonable substitutes) from any electronic components supplier. The exact dimensions of the case are not critical but our design exactly fits the box described.

Quantity	Item	Maplin No
8	4.7 K-ohm 0.4 Watt resistor	M4K7
8	240 ohm 0.4 Watt resistor	M230R
1	1 µF electrolytic capacitor	FF01B
1	0.1 µF capacitor	BX76H
8	Red LED	WL27E
8	1N4148 diode	QL80B
1	W005 bridge rectifier	QL375
3	7407 hex buffers	QX76H
1	µA7805UC voltage regulator	QL31J
1	36 strip × 50 hole veroboard	FL09K
3	14 pin DIL chip socket	BL18U
1	2 oz roll 22 swg tinned wire	BL14Q
1	metre 12-way ribbon cable	XR65V
8	Black 4mm socket	HF69A
8	Red 4mm socket	HF73Q
8	Black 4mm plug	HF62S
8	Red 4mm plug	HF66W
1	2.1mm PC mounting power socket	RK37S
1	12-way minicon socket	YW30H
1	115 × 95 × 37mm plastic box	LH22Y

New Parts

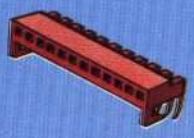
The parts list contains many components already described in the course (see pages 115 and 138), but the parts we have illustrated may be unfamiliar. The power socket, rectifier and regulator are part of the box's power supply. Our design will allow us to use almost any mains transformer as the input, provided that its output is between 7v and 25v — AC or DC.

The 12-way socket will be the box's input/output port through which data is passed to and from external devices.

Bridge Rectifier
Converts a range of input voltages (AC or DC) to DC voltage of known polarity

Voltage Regulator
Smooths the output of the bridge rectifier (which may be 'pulsed' or 'ragged') to a steady 5v DC

Power Socket
Accepts a 2mm power plug, as used on many computer PSUs (the Spectrum, for example), and mounts directly onto the circuit board



Minicon Socket
Mounts directly onto the board and allows easy connection of external cables

as lights, tape recorders, televisions and so on. In addition, we can add a digital-to-analogue converter, which will then enable us to drive decoded seven-segment displays. Because of the low voltage and current output of the user port we will also need an external power supply of nine volts. As each module is constructed it will be connected to a common bus, along which the eight data lines, an earth and a nine volt power line will be routed. In this way, we can 'piggy-back' or interconnect modules to the system. This then, is our plan of action for the forthcoming instalments of the Workshop course.

Building The LED Display

The LEDs will occupy a strip of veroboard four tracks wide, each track having 36 holes. Insert the LEDs as shown, with the longer legs on the edge track, allowing four holes between each. This should be the same as the spacing of the drill holes in the box; if necessary, reposition the LEDs. Solder the legs to the copper tracks, being careful not to run solder from one track to the other. Use a multimeter to check the resistance between the two tracks; if it is zero, you have bridged the tracks somehow.

Cut a 20 cm length of the 12- way ribbon cable, and remove three wires, leaving a nine-way ribbon including the coloured wire. Bare and tin the ends of the wires. Solder the coloured wire to the edge track of the board. Now solder each of the remaining wires along the other track, each wire next to an LED leg. Cut this track in seven places, so that each pin and wire pair is isolated on its own little strip of track. Once again, test for bridging between tracks and across the breaks.

Gently ease the LEDs and board into the holes in the box, screw the sockets into their holes, then sit back and admire your work while waiting for the next instalment, in which we will show you how to build the circuit board