check list for electronic fault finding

or 'where and how to look for what that doesn't'

Before soldering in components

- Check that the components agree with the parts list (value and power of resistors, value and voltage rating of capacitors, etc . . .). If in any doubt, double-check the polarized components (diodes, capacitors, rectifiers, etc . . .).
- If there is a significant time lapse between last reading an article and building the circuit, take the trouble to re-read the article; the information is often given in very condensed form. Try to get the most important points out of the description of the operation of the circuit, even if you do not understand exactly what is supposed to happen.
- If there is any doubt that some components may not be exact equivalents, check that they are compatible.
- Only use good quality IC sockets.
- Check the continuity of the tracks on the printed circuit board (and through-plated holes with double-sided boards) with a resistance meter or continuity tester.
- Make sure that all drilling, filing and other 'heavy' work is done before mounting any components.
- If possible keep any heat sinks well isolated from other components.
- Make a wiring diagram if the layout involves lots of wires spread out in all directions.
- Check that the connectors used are compatible and that they are mounted the right way round.
- Do not reuse wire unless it is of good quality. Cut off the ends and strip it anew.

After mounting the components

- Inspect all solder joints by eye or using a magnifying glass and check them with a continuity tester. Make sure there are no dry joints and no tracks short circuited by poor soldering.
- Ensure that the positions of all the components agree with the mounting diagram.
- Check that any links needed are present and that they are in the right position to give the desired configuration.
- Check all ICs in their sockets (see that there are no pins bent under any ICs, no neighbouring ICs are interchanged, etc . . .).
- Check that all polarized components (diodes, capacitors, etc . . .) are fitted correctly.
- Check the wiring (watch for off-cuts of component leads); at the same time ensure that there are no short circuits between potentiometers, switches, etc . . ., and their immediate surroundings (other components or the case). Do the same with mounting hardware such as spacers, nuts and bolts, etc . . .
- Ensure that the supply transformer is located as closely as possible to the circuits (this could have a significant influence in the case of critical signal levels).
- Check that the connections to earth are there and that they are of good quality.
- Check that any pins, plugs or other connectors used are making good contact.
- Make sure the circuit is working correctly before spending any time putting it into a case.

And if it breaks down . . .

- Recheck everything suggested so far.
- Reread the article carefully and clarify anything about which you are doubtful.
- Check the supply voltage or voltages carefully and make sure that they reach the appropriate components especially the pins of the ICs (test at the pins of ICs and not the soldered joints!).
- Check the currents (generally they are stated on the circuit diagram or in the text). Don't be too quick to suspect the ICs of overheating.
- If possible check the operation of the circuit in separate stages. As a general rule, follow the course of the signal.
- Check the contents of any PROMs or EPROMs fitted.
- While checking voltages, currents, frequencies or testing the circuit with an oscilloscope, work systematically and take notes.
- It is always a good idea to do any fault finding as a combined operation with a friend, two heads are better . . .
- Be wary of 'red herrings' when fault tracing. Do the simple checks first.
- Finally, remember our constant companion Murphy is looking over your shoulder. If that part of the circuit cannot possibly be wrong and you haven't checked it – that's where to start looking.
- . . . And don't forget to switch the power on and check the fuses!