

burnt away by the arc, thus clearing the short!

Polycarbonate

Not so common, but very useful where a capacitor is needed for timing applications. They have a much lower temperature coefficient than polyester, and are much better suited to AC power applications. The actual value is normally printed clearly on the case. For a capacitor in the 1-10uF region with a close tolerance of 5%, they are ideal — except that one could set you back as much as £4!

Electrolytics

Virtually everyone will have come across these in one form or another. Values from 0.1uF up to one whole Farad, in every size, shape and form, for any application.

The most common type are aluminium electrolytic where two aluminium foils, separated by insulating papers, are wound into a roll. The roll is then impregnated with a liquid (the electrolyte), aged and stabilised, then sealed into an aluminium container.

Although useful, they do have serious limitations which must be borne in mind when selecting a capacitor for certain applications. Their leakage current is very high by

comparison with other types, and they cannot be used at high frequencies particularly well. They do not age well, and the tolerance can be as much as +200% on the high side. For AC power line filtering and audio decoupling this is not usually of much concern.

The voltage rating however is of prime concern. All such capacitors are marked with their "working voltage", and this should not be exceeded in any application. The results are often disastrous with leaking chemicals and explosion. During one HF Contest, I had an electrolytic in a Linear amplifier explode (it livened things up if nothing else early in the morning) but the Shack couldn't be used for ten minutes afterwards due to smoke and fumes.

A Few Guidelines

Temperature is also important (usually the maximum temperature is marked — often 85 deg C) — exceeding this can have the same effects as voltage overloads!

Identification is usually relatively easy in terms of value, although sometimes a marking may only be 10/25, which is 10uF at 25V working. Picking a type with a higher voltage rating than required is safer,

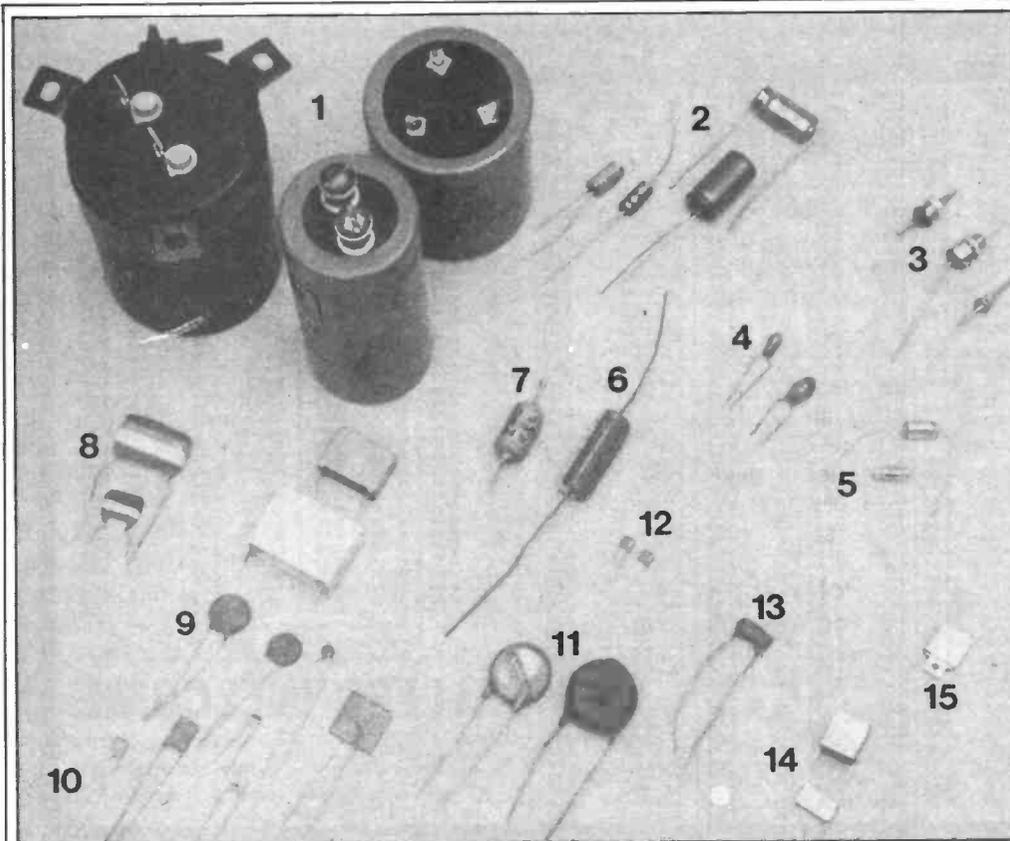
and will not usually cause any problems, other than physical size. In small values at low (50V) voltages, the cases are normally axial or radial. In the former, the leads come out each end of the package, and in the other, both out of end. Radials are a popular choice of PCBs.

In larger values, tags or even screw terminals are common, possibly with a mounting clip for chassis fixing. There are computer grade types in very high values which are ideal for smoothing PSUs. If you need a higher voltage rating capacitor for say a valve Linear PSU, then several values can be made into a series/parallel arrangement to get the required capacitance and voltage rating. However, it is important that each capacitor has a high value resistor across its terminals to level out the voltage across each unit (around 100K is usual, and of 1 watt rating, depending on the actual voltage in use).

Caution . . . NEVER discharge a capacitor with a metal object such as a screwdriver — the capacitor won't like it, and your screwdriver is liable to weld itself to the tag anyway. Use a resistor and discharge it gently.

Tantalum

For small physical size, and much



A Crowd of Capacitors

1. High Value Electrolytics
2. Small Value Electrolytics
3. Feedthrough
4. Tantalum Bead
5. Polystyrene
6. Polycarbonate
7. Paper
8. Mullard C280 Polyester
9. Ceramic Disc
10. Ceramic Plate
11. High Voltage Ceramic Discs
12. Monolithic Bead
13. Tubular Ceramic
14. Polyester (Siemens)
15. Unelco Mica