

## COMPONENTS

**R**ECENT DISCUSSIONS regarding the components selected by those of us who like to "build our own" test equipment, amplifiers, power supplies, and other electronic apparatus brings to light some interesting facts which have rarely been mentioned in technical literature from the viewpoint of the constructor.

In building equipment for commercial sale—such as mass produced radio and TV sets, for example—the element of cost is of primary importance. The price of a tube socket or a resistor is usually measured in cents at the manufacturing level, but that figure is multiplied by a factor of around five when the finished product appears at the consumer level. Thus if a TV set with 150 resistors should be built with a higher quality part costing only one cent more than the competitive grade, this difference alone makes the selling price of the set some seven and a half dollars greater than if the low-priced part were used. As another example, it has often been said that Lock-in tubes never attained their deserved popularity because their sockets cost three-tenths of a cent more than the simpler-to-make octal.

In the construction of amplifiers or test equipment on a one-of-a-kind basis, or even for those hand-built units often assembled by the custom-builder, the few extra cents—or even dollars—are not of so great importance. When we consider that the average home- or shop-built amplifier involves a cost measured in dollars for the equipment, and probably in tens of dollars for the labor of building and testing, it seems desirable that we take a closer view of the economic advantage obtained by the use of the minimum-priced components. Not that we begrudge the labor—we'd be the last to suggest that the labor cost be taken into account for such equipment as we construct for our own use—but the fact remains that it is actually a factor in the over-all cost of the finished product. Therefore, when we do use a cheaper component, we are risking the performance of the unit for a small percentage of saving, and it is doubtful if this is an intelligent practice.

Many constructors are prone to use half-watt resistors throughout a circuit, unless the current requirements completely preclude it. We believe that any resistor which carries direct current—with the possible exception of a cathode resistor which is usually bypassed, and usually of low resistance value—should be at least of a one-watt rating. In any case, the resistor should be specified to work with a factor of safety of the order of four—one which dissipates 0.23 watts should preferably be a one-watt unit, and so on. The same reasoning applies to the selection of tube sockets, selector switches, coupling and bypass capacitors, wire, cable-plugs and receptacles, and any other component for which there is a high-rated equivalent.

This practice is followed rigorously by manufacturers of equipment for the military services, and for high-quality home construction it is strongly recommended.