ELECTRICAL SAFETY FIRST

By Donald K. Roeber

WHEN DESIGNING AND BUILDING HOME ELECTRONICS PROJECTS, important safety factors should not be overlooked. If the project is powered by the 117-volt AC line, it is a good idea to have the chassis grounded and the circuit properly fused.

If you are using a metal project box, purchase a three-conductor line cord instead of the usual two conductor. After the line cord has been fastened to the box with a suitable strain-relief clamp, attach an eyelet to the end of the green ground wire. Next, place a lock washer on the ground screw of the box, push the eyelet onto the screw, and secure it tightly with a nut. If there is no ground screw in the chassis, one can easily be drilled and inserted. For those project boxes that have a separate cover and base, you may want to connect the ground circuit to the cover, also. That is done by inserting an insulated jumper wire between the ground screw of the base and the ground screw of the cover. Leave enough slack so that the case and cover can be pulled apart for servicing.

Lastly, check for good continuity by placing the test leads of an ohmmeter between the center ground prong of the line-cord plug and the metal box. The reading should be zero. Proper grounding will protect the user of the project from electric shocks in the event that the unit shorts out.

To avoid dangerous current flow during a short circuit, the unit should be fused. If the schematic diagram of the circuit you are using does not specify the type of fuse to use, the total current flow of the project can be measured by using an AC ammeter as shown in Fig. 1. Note the meter reading and select a fuse which is slightly larger. For example, if your circuit draws .420 amperes, install a fuse rated at .500 amperes in the black lead circuit. Likewise, if your circuit draws 3.1 amperes, install a 4.0 ampere fuse. The "normal-blo" fuses are adequate for most digital circuits. If your circuit involves magnets, solenoids, motors, or lamps, the "slo-blo" type fuses are recommended because they are designed to withstand momentary high-current surges but still break down quickly if a short occurs.

With proper soldering and insulation, most home projects are reliable and quite safe. The addition of those safety measures, though, will add an extra feeling of security when you or someone else uses your project. ■