Tuner's Topics

Electrical Safety

by W01 Wanda Wig Wag

Safety can never be stressed enough when you are working with electricity, an everyday thing for communicators. The human body, while it can withstand a lot of abuse, is an effective conductor of electricity—and in this case, too much of an otherwise good thing can be fatal.

How the body reacts to electric shock depends upon how much current passes through it and how long the current lasts. A lot of people think that the higher the voltage, the greater the damage to the body. This is correct, however, only to the extent that the amount of current is determined by the amount of voltage.

While most of us think that the human body is rather durable (for those of us who survive childhood), it doesn't take much electricity for your body to react adversely. For example, a current so small as one milli-Angstrom (1mA, or one-thousandth of one ten-billionth of a meter) will leave the sensation of warmth in the hand. Bodily reactions increase in severity as the current increases. Tissue burns when the current reaches a level of 10A, yet death may result from a shock of approximately 18mA strength.

EFFECTS OF AN ELECTRIC CURRENT ON THE HUMAN BODY

CURRENT

10A— Burning of tissue (usually will not cause fibrillation, survival possible if removed from circuit in time)

1A— Ventricular fibrillation (heart flutters and blood circulation stops)

100mA— Breathing restricted

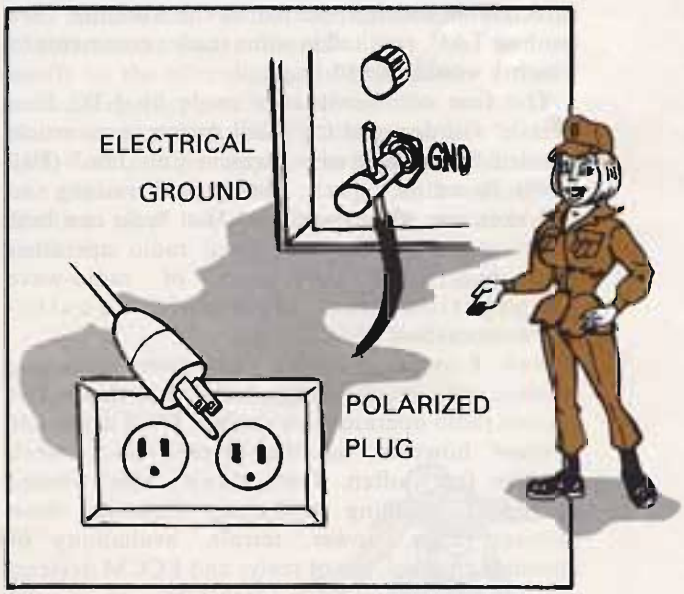
— "Let-go" current

10MA—

1mA— Threshold of sensation

Also important in determining the damage that an electric current can cause is body impedance. According to Ohm's Law, the ratio of applied voltage to the impedance of a circuit determines the amount of current that will flow through that circuit. At low frequencies and voltages, the body's "circuit" acts much like a resistor. However, when the skin is wet, the body's impedance to the current is considerably lower.

Knowing that electrocution may be a hazard of the communicator's job makes safety consciousness critical. Technicians, for example, can take some rather simple precautions to minimize the possibility of shocks: working in an area with a dry floor, grounding exposed metal parts of electronic equipment, and using polarized plugs and isolation transformers when repairing equipment are basics.



Safety awareness should be even doubled for women working in the electronics field. In experiments on various thresholds of bodily reaction to shock, women were affected at levels approximately 2/3 the level of those thresholds for men.

WHOOPS!

In reference to "Tuner's Topics" on page 45 of the Summer 1979 issue of TAC: I believe you are talking about milli-amperes rather than angstroms. The angstrom is a unit of length.

CPT R. C. MOWBRAY
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Although WO1 Wig Wag insists that "angstrom" was used deliberately in an effort to determine if anyone read the "Tuner's Topic" column, we must admit that the TAC staff made a mistake. As you and several readers have pointed out, "ampere" is the correct term. It appears there's an enormous difference between the symbol "A" and the symbol "A" with a small circle at the top. We assure you, though, that in the future the TAC staff will go many angstroms to avoid errors that may raise our readers' amperes!