measure a wide range of temperatures. Thermocouples are pairs of dissimilar metal wires joined at least at one end, which generate a voltage between the two wires that is proportional to the temperature at the junction. This is called the Seebeck effect, in honor of Thomas Seebeck who first noticed the phenomena in 1821. It was also noticed that different metal combinations have a different voltage difference. Thermocouples are used to measure cylinder head temperatures and Turbine Inlet Temperature (TIT).

Light Sources

A solar cell or a photovoltaic cell is a device that converts light energy into electricity. Fundamentally, the device contains certain chemical elements that, when exposed to light energy, release electrons.

Photons in sunlight are taken in by the solar panel or cell, where they are absorbed by semiconducting materials, such as silicon. Electrons in the cell are broken loose from their atoms, allowing them to flow through the material to produce electricity. The complementary positive charges that are also created are called holes (absence of electron) and flow in the direction opposite of the electrons in a silicon solar panel.

Solar cells have many applications and have historically been used in earth orbiting satellites or space probes, handheld calculators, and wrist watches.

Schematic Representation of Electrical Components

The schematic is the most common place where the technician finds electronic symbols. The schematic is a diagram that depicts the interconnection and logic of an electronic or electrical circuit. Many symbols are employed for use in the schematic drawings, blueprints, and illustrations. This section briefly outlines some of the more common symbols and explains how to interpret them.

Conductors

The schematic depiction of a conductor is simple enough. This is generally shown as a solid line. However, the line types may vary depending on who drew the schematics and what exactly the line represents. While the solid line is used to depict the wire or conductor, schematics used for aircraft modifications can also use other line types, such as a dashed to represent "existing" wires prior to modification and solid lines for "new" wires.

There are two methods employed to show wire crossovers and wire connections. *Figure 12-45* shows the two methods of drawing wires that cross: version A and version B. *Figure 12-46* shows the two methods for drawing wire that connect version A and version B. If version A in *Figure 12-45* is used to depict crossovers, then version A for wire connections in *Figure 12-46* is used. The same can then be said about the use of version B methods. The technician encounters both in common use.

Figure 12-47 shows a few examples of the more common wire types that the technician encounters in schematics. They are the single wire, single shielded, shielded twisted pair or double, and the shielded triple. This is not an exhaustive list of wire types but a fair representation of how they are depicted. *Figure 12-47* also shows the wires having a wire number. These are shown for the sake of illustration and vary from one installation agency to another. For further understanding of a wire numbering system, consult the appropriate wiring guide published by the agency that drew the prints. Regardless of

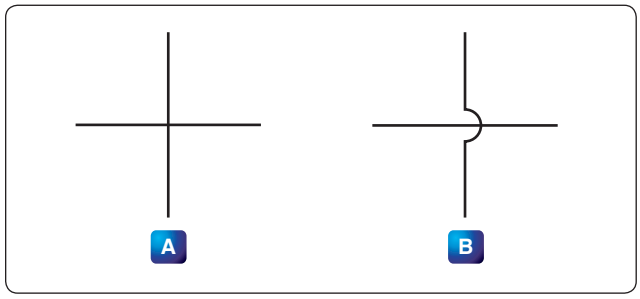

Figure 12-45. *Unconnected crossover wires.*

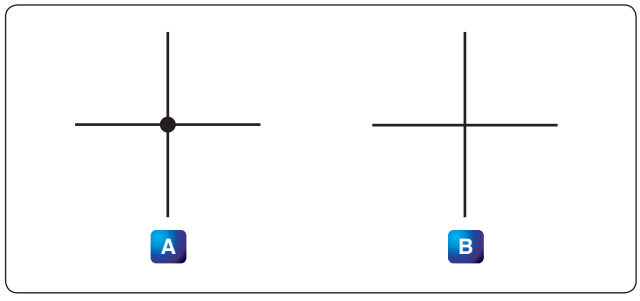

Figure 12-46. *Connected wires.*

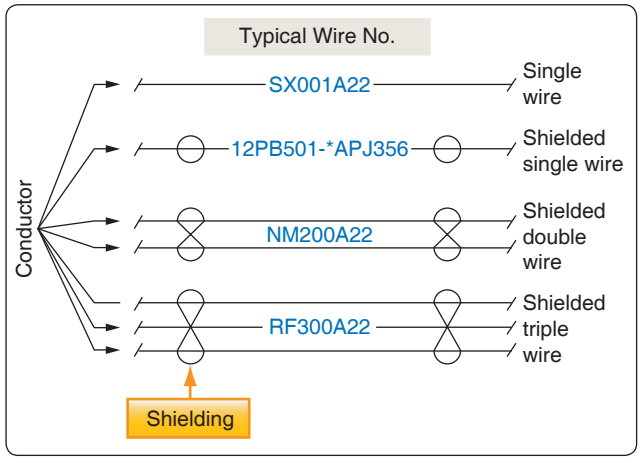

Figure 12-47. *Common wire types.*