

Pilots became aware of the need for increased systems training to be able to troubleshoot problems in flight. Because schematics had become the key to unraveling the mysteries of any given system—not just electrical—pilots had to learn to interpret them. Unfortunately, systems continued to become more complex and schematics rapidly took on nightmarish qualities. I cringe when I think of the electricity course I had to take as a maintenance student at the University of Illinois, and the hours spent poring over incomprehensible electrical-system schematics.

Electrical-System Schematics

The purpose of a schematic is to provide a means for the mechanic to trace a system visually. It is typically used as an aid in locating the source of a problem, and essentially is a road map for troubleshooting. Unfortunately, maintenance schematics go into far greater detail than is required by the pilot for whom only that information, which may be used to solve in-flight problems, is useful.

Thanks to the General Aviation Manufacturer's Association (GAMA), simplified pictorial schematics were initiated some years ago for general-aviation aircraft. The effect was a quantum leap forward in pilot understanding and ability to troubleshoot systems. Gone were the obscure symbols for motors, alternators, starters, switches, and other components. Everything was replaced by simplified, miniature drawings of actual components, as shown in Figure 8-18. Alternators now look like little alternators, master switches like little master switches. Fuses, circuit breakers (CB), switches, and other controls and equipment are easily distinguished and diagrammed in a simplified, functional order that enhances system understanding. The modern pilot-oriented schematic permits good system understanding by even the most mechanically unsophisticated pilot.

When I was a King Air simulator instructor for FlightSafety International, I was introduced to a game called "what if," which I subsequently taught to all my crews. Designed to keep a pilot sharp on systems and emergency procedures, "what if" can be played anywhere. If there are two or more players, one person asks a question and the others see if they can answer it. For instance, what if the gear won't extend even with the manual gear-extension procedure? Or what if the alternator field CB pops? If you are playing alone, then sit in your airplane with the manual close at hand and ask yourself "what if" questions, referring as necessary to the procedures and system section of the manual.

To be able to play "what if" successfully, a pilot must be familiar with the systems and procedures of the airplane. "What if-ing" the electrical system requires not only a basic understanding of the system, but also what specific equipment it operates. Radios, lights, and pitot heat are obvious, but there are some not-so-obvious ones. Some equipment may or may not use electricity: for example, hydraulic landing gear, fuel valves, gyros, and stall-warning devices.

On the other hand, some instruments that you might expect to be powered by the electrical system may not be, such as cylinder head temperature, oil pressure, and oil temperature gauges. The point of the game is to keep an in-depth knowledge of your aircraft systems fresh in your mind.