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Electrical Systems

ELECTRICAL SYSTEMS HAVE BEEN AN ONBOARD FIXTURE OF AIRcraft since the Wright Flyer. In those days the role of electricity was limited to the magneto providing sufficient voltage to spark the fuel/air mixture. As demand increased for electricity to power other equipment, first the wind-driven generator was developed and subsequently its engine-driven version.

For many years, light planes exclusively used the 14-volt electrical system. Starting approximately in the early 1980s, the 28-volt system began to take over light aircraft. In either case, the fundamentals are the same. The primary purpose of igniting the fuel/air mixture is still the exclusive, and independent, domain of the magneto. However, the demand for electrical energy in the airplane has increased tremendously.

Even the simplest electrical systems in modern light aircraft power engine starters, cockpit and position lighting, navigation and communication equipment, engine and flight instruments, and accessories ranging from cigarette lighters to in-flight telephones. Unfortunately, as the complexity of the electrical system increased over the years, the average pilot's understanding of it decreased. While we can leave the theory of electrons, neutrons, protons, and so-ons to the engineers, a basic understanding of the fundamentals of electrical systems is necessary if a pilot hopes to be able to adequately preflight or determine in-flight problems.

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