Handling Electrical Abnormal and Emergency Situations
Lex Crosett
February 2026

As a CSIP working with Cirrus pilots in transition or recurrent training scenarios, a typical interaction concerning electrical problems goes something like this:

- I point out the window, and say, "*Look – there's the Goodyear blimp.*" and switch off one of the alternators. In short order, a yellow CAS message like this appears.

- My students either look slightly annoyed or somewhat amused by my poor sense of humor.

I then ask – "What's the very first thing you plan to do?"

- Nearly 100% of the time, the answer is something like this:
  - *"I'm going to pull and reset the ALT1/2 breaker and then turn the alternator switch on and off." or*
  - *"I'm going to reduce electrical load right away, turn off the air conditioner, pull my iPad charger cable out." or*
  - *"You should stop turning off switches in my airplane, I don't like anyone doing that."*

While these responses can be very energetic, they aren't quite right. The answer I am hoping to hear is:

"I'm going to maintain aircraft control, assess the situation, and then take appropriate action, which will include running the checklist for that CAS message."

Most electrical problems in a Cirrus are considered abnormals. But a few are emergencies:

- Yellow CAS = Caution/Abnormal
    - Flashing – more urgent
- Red CAS = Warning/Emergency

Remember, there are no memory or immediate action items associated with Yellow CAS messages, and none associated with the Red CAS messages concerning the electrical system.

➔ Maintain aircraft control, get to a safe altitude, and ***run the appropriate checklist!***

ALT 2 Caution (Failure)

ALT 2

Low Alternator 2 Output

1. ALT 2 Circuit Breaker ..... CHECK AND SET
2. ALT 2 Switch..... CYCLE

◆ If alternator does not reset:

a. ALT 2 Switch .....OFF

b. Continue Flight, avoiding IMC or night flight as able (reduced power redundancy).

Procedure Complete

• NOTE •

Alternator 2 output is low, indicative of alternator failure. Isolated Alt 2 failure will not typically be associated with any other unusual indications, cautions or warnings (Alt 1 will pick up all loads).

If you are on an instrument approach in IMC, or in the pattern, complete your approach and land the airplane. Then you can handle the problem on the ramp. If the CAS Message is red, maintain control and get to a safe altitude; then run the appropriate checklist promptly.

Fixating on a CAS message in the middle of an instrument approach, or in the pattern at a busy airport, or at an unsafe altitude, can lead to a pilot-induced loss of control or contribute to an unrelated mistake with severe consequences. Of course, one failure can lead to another, so it is important to take appropriate action as soon as it's safe to do so.

It's also important to be suspicious about a single system failure – if you just lost an alternator, what else might be wrong? Even if the airplane appears to be sound, it may not be.

Consider stopping short and getting help; don't press on in daytime VFR conditions just because the checklist says, "Avoid night and IMC conditions." Don't fly past hospitable, well-equipped airports when you don't know the root cause of the failure.

Know Your Electrical System

It's important to know the limitations of your Cirrus' electrical system. Get a copy of the circuit breaker panel layout for your airplane and keep it handy. Consider installing circuit breaker collars on ALT1 and ALT2 to make them easier to find.

The G7 and G7+ panels have been reorganized to make finding breakers much simpler. The letter and number of the breaker to pull or reset is called out in the checklist, a huge help when under pressure.

Practice finding the electrical system CAS message checklists in your online checklist menus. When a rusty Cirrus pilot loses an alternator, they frequently open the list of Abnormal checklists and become frustrated when they can't find the procedure relating to the message. When you receive a CAS message, it will generally be found in the list of checklists labeled "Crew Alerting System." In the G7/G7+, the appropriate checklist will pop open for you, making the process much simpler.

In older Cirrus generations, loss of ALT1 and eventual BAT1 battery exhaustion can disable your flaps, along with your audio panel, your MFD, your autopilot (DFC90), and your fuel gauges. In these cases, planning for a long runway and no-flap landing must be part of your plan.

When was the last time you practiced a no-flap landing with a CSIP, or a no-flap ILS to a landing? If you end up with BAT2 powering only the essential bus, when was the last time you flew with only the PFD operational?

Electrical Defense-in-Depth

From the G3 Perspective Cirrus generation on to current, the electrical system has significant built-in redundancy with two alternators and two batteries powering a well-thought-out set of master and essential busses. (It's outside the scope of this article to fully describe all the components of each generation's electrical system.) You should understand your airplane's system design so that you can sort out how best to respond to abnormal indications or loss of a component *using the correct checklist*.

Log in to Cirrus Approach and select either the SR Series Emergencies and Abnormals course or the SR Series Systems course to learn more about the specifics of your Cirrus generation.

Another option is to work with a CSIP/TCI from Mike Goulian Aviation to learn more and practice all of the related procedures.

Understanding the Electrical System Design

From the G3 Perspective generation forward, the easiest way to understand the electrical system design is as follows:

1. **ALT2 runs the airplane.**
2. ALT1 runs the systems in the airplane that are "***nice to have***" (A/C, convenience power, landing lights, EVS camera in the 22/22T).

   -> Memorize this detail and you are ahead of the game!

3. ALT1 is oversized and can also step in and run the whole airplane, including the nice- to-have systems if ALT2 fails.
4. ALT2 cannot step in and run the nice-to-have systems, but it will continue to run all the **must-have** parts of the airplane if ALT1 fails. The inline diodes prevent ALT2 from running the nice-to-have items as a backup.
5. BAT1 and BAT2 back up each alternator and have the same limitations as the associated alternator with respect to taking over.
6. BAT1 is on the firewall (forward of the firewall in the engine compartment for G6 and older and on the firewall inside the cockpit (G7 and newer).
7. BAT2 is installed aft of the baggage compartment to provide physical system isolation and power the essential bus. Continuing to power the essential bus keeps your PFD and primary flight/avionics capabilities operating so that you can get the airplane on the ground following a generalized loss of electrical capability in the engine compartment.
8. The Master Control Unit (MCU) is a briefcase-sized unit attached to the firewall in front of the pilot and is the brains of the electrical system. The MCU contains electronics that regulate the operation of the alternators and batteries and will remove an alternator in under- and overvoltage conditions. There is a circuit board in the MCU that contains model-specific firmware. When your airplane needs a CAPS repack, the MCU will often require an update or replacement, for example.

Electrical System Worst-Case Events

Other than an electrical or engine fire that destroys electrical gear forward of the firewall, there are a few worst-case events that can occur with your electrical system.

Dual alternator failure

The most severe is the loss of both alternators, leaving you with only battery power and limited time to land (approximately 30 minutes at best). Prompt use of the checklist and landing as soon as possible will make the best of this very challenging situation.

In day VFR conditions, landing quickly should be simple. At night or in IMC, promptly getting the airplane on the ground can be more difficult and time consuming. When was the last time you checked your flashlight. Have you tested the batteries, and is the flashlight stored in an easy-to-reach location?

Using CAPS as a final alternative in a dual alternator failure might be the best response at night or in IMC.

Alternator overvoltage

Another worst-case event is alternator overvoltage, where an alternator voltage regulator fails and an alternator runs away, putting out much higher voltage than your avionics can handle (>32 volts). Your avionics will not survive overvoltage for long, so you need to promptly take action using the appropriate emergency checklist. In this case, you must promptly identify the correct alternator checklist and disable that alternator. This is an emergency procedure.

The RED Warning CAS messages that indicate either high or low voltages are:

- **M BUS 1 Warning**
- **M BUS 2 Warning**
- **ESS BUS Warning**

When you review these emergency checklists, you will note the need to disable the offending power source if voltage goes above 32 volts. Once you remove an alternator from the system, you will be down to a single alternator, with perhaps only battery power remaining. If you don't have a suitable landing location close by in night or IMC conditions, consider using CAPS as a final alternative before the last of your battery power is gone.

Bottom Line

Your Cirrus is an all-electric airplane, so knowing your system's design and limitations is very important. Most electrical problems have a quick solution that will get you home or on the ground safely with minimum difficulty due to the redundancy built into the airplane.

Recommendations:

- Make a copy of your circuit breaker panel layout and electrical system diagram and keep them handy, along with several easy to grab flashlights (even during the day).
- Practice finding and completing the electrical system CAS message checklists (Caution/Warning) on the ground or in a simulator. Take note of how difficult it is to find the correct breaker without sliding the pilot's seat back while using a flashlight.
- When faced with an electrical CAS message, consider what else might be wrong and stop short if possible. Get help and advice from Cirrus AOG or a Cirrus trained mechanic.

Given the level of redundancy and system isolation in the Cirrus electrical system design, you should always have enough backup capability to get the airplane on the ground safely. Take some time to review your airplane's system and checklists. Any failure may come as a surprise, but you will be prepared to handle it correctly the first time and gracefully maintain aircraft control (and your composure).