



# Canadian Association of Rocketry

## Electronics Endorsement Program

### Overview

More and more flights are featuring electronics of some sort, once considered extreme and highly unique, they are becoming more and more commonplace. More fliers are also attempting to get their HPR Level 4 Certification. In response, CAR has developed the **Electronics Endorsement Program**.

The CAR Electronics Endorsement Program is not mandatory or required for any flight other than starting the HPR Level 4 Certification process. For Model Rocketry and HPR up to L impulse, the Electronics Endorsement is an official recognition of achievement and a demonstration of the skills and knowledge required to integrate and use electronics in rocket flights.

It's possible for F and G impulse flights to be used for Electronics Endorsement certification flights. As long as the rockets and the recovery systems meet the requirements below, even Mid-Power Rocketry enthusiasts can earn their Electronics Endorsement.

The CAR Electronics Endorsement is a prerequisite for CAR Level 4 Certification. Any HPR Level 3 certified flier wishing to fly an HPR Level 4 Certification flight must already have his or her Electronics Endorsement. This requirement is not new. The HPR Level 4 Certification has always required the flier to have flown two electronics-equipped flights prior to their certification flight. The Electronics Endorsement is the formal process for demonstrating compliance with this requirement.

The CAR Electronics Endorsement is also a requirement to be considered for L4 Certification Committee (L4CC) membership. The CAR Electronics Endorsement is also a requirement for attaining the Rocket Inspector Level 2 designation.

There are no age restrictions in the Electronics Endorsement Program. Any current CAR member, senior or junior, can earn the Electronics Endorsement.

The program is very simple – just fly two flights on two different rockets, both in dual deployment configurations, with electronics controlling the deployment, (for HPR flights, have the RI performing the pre-flight inspection initial the certification form), and then have 2 Senior CAR members sign the form after each successful flight. Then submit to CAR HQ along with the processing fee. CAR HQ will then update the database and issue the flier a certificate and a new Membership Card indicating that they have the Electronics Endorsement.

Use the **Electronics Endorsement Certification Form**, available for download from CARWeb, at [www.canadianrocketry.org](http://www.canadianrocketry.org), or from your local club's CAR Liaison, or write to CAR HQ to have one mailed to you.

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## Requirements

The requirements to obtain a **CAR Electronics Endorsement** are:

1. two (2) flights, each on a different rocket;
2. the Electronics Endorsement certification flights cannot be HPR Level 1, 2, or 3 Certification flights;
3. both flights must be successful flights using much the same standards as for an HPR certification flight – the flight must be stable, recovery system must deploy as designed and the rocket must be recovered with minimal landing damage and substantially ready to be re-flown;
4. both flights must be flown to apogees where the apogee deployment event can be seen to have occurred from the ground;
5. both rockets must utilize a dual deployment configuration, in that an event must occur at apogee that will retard the descent of the rocket and another event before landing to deploy a parachute or similar device;
6. two (2) Senior CAR Members in good standing must witness each flight and sign the Electronics Endorsement Certification Form;
7. for HPR flights, the Rocket Inspector who inspected the rocket prior to flight must inspect the rocket after the flight and indicate so on the Electronics Endorsement Certification Form;
8. fully completed Electronics Endorsement Certification Form, submitted to CAR HQ.

## Process

The detailed process has a number of steps as outlined below.

1. When the flier decides to make a particular flight an endorsement flight, he or she would fill out the Electronics Endorsement Certification Form and for HPR impulse flights, submit it to the Rocket Inspector during the pre-flight inspection of their rocket.
2. The Rocket Inspector will initial in the area provided to indicate that he has inspected the rocket prior to flight and knows it's a certification flight. A heads-up announcement is not required, unless one is called for by the RI or LCO for other reasons.  
(Note: not required for Model Rocket flights)
3. The flier then flies and retrieves the rocket and brings it back to the Launch Table for the RI to sign off or to two witnesses to inspect. The flight must be successful and the dual deployment recovery system must function as indicated during the pre-flight inspections and be activated by on-board electronics in order to be considered a successful flight for the purposes of endorsement.

(Note: not required for Model Rocket flights)

4. The flier will have two (2) senior CAR Members in good standing who witnessed the flight sign off on the Electronics Endorsement Certification Form (two for each flight).
5. The flier then repeats the above process for their second flight, keeping in mind the requirement that a different rocket be used for the second flight.
6. With two successful flights and a completed Electronics Endorsement Certification Form, the flier submits the Form and the \$5 processing fee to CAR HQ.
7. CAR HQ will review the Electronics Endorsement Certification Form and approve it or contact the flier for clarification if required.
8. Once approved, the Electronics Endorsement Certification Form data is entered into the CAR Database.
9. With the data in the database, the Secretary will print out the Electronics Endorsement Certificate for the CAR President to sign, produce a new CAR Membership Card indicating the holder has the Electronics Endorsement, and mail both out to the member.

## Benefits of the Electronics Endorsement

There are a number of benefits to getting the Electronics Endorsement, including:

- an official CAR Certificate indicating the holder has the **Electronics Endorsement**;
- a Membership Card indicating that the holder has the **Electronics Endorsement**;
- the ability to use [E] after their Membership number to indicate that they have the **Electronics Endorsement** (for example in email signatures and other correspondence);
- meeting a prerequisite for starting the HPR Level 4 Certification process;
- meeting a prerequisite for acceptance as a CAR Level 4 Certification Committee Member;
- meeting a prerequisite for granting of Rocket Inspector Level 2.

## Frequently Asked Questions

**Q:** Does this mean I can't fly with electronics until I get my Electronics Endorsement?

**A:** No, that's not the purpose of the program. The main idea behind the program is to document the fulfillment of having two electronics flights as one of the prerequisites for a Level 4 Certification attempt and for the position of Rocket Inspector Level 2. If you don't plan on getting either of these,

then there is no need for you to get the Electronics Endorsement. You can still get the endorsement however and get the certificate and pleasure of documenting an achievement. So with or without the Electronics Endorsement, you can fly using electronics in your rockets.

**Q:** Why does the recovery configuration have to be dual deployment? Can't I use some other configuration for deployment?

**A:** The dual deployment configuration was chosen for a number of reasons:

- it's a common technique so there's lots of help and documentation available;
- it's more complex than simple main chute deployment at apogee;
- it's a consistent, simple standard that we can use to determine success;
- for the endorsement to be meaningful, everyone should certify to the same standards and requirements.

This is not to say that before or after getting your endorsement, you can only fly dual deployment. For other than your Endorsement flights, fly whatever recovery system configuration you want! In fact, the more innovation the better!

**Q:** I plan on doing my Level 2 and Level 3 Certification flights with electronics, can those count as my endorsement flights?

**A:** No, it was decided that HPR Level 1, 2 and 3 Certification flights, even with electronics will not be able to count towards the endorsement.

**Q:** Can I get my Endorsement with two G impulse flights, and then attempt my Level 4 Certification?

**A:** No, the requirements for Level 4 specify that the 2 required electronics flights must be HPR flights, that means H through L impulse. A flier could get their Electronics Endorsement with G motors, but they still have to meet the prerequisites of two HPR flights with electronics before starting their Level 4 process. Fliers wanting to start the Level 4 Certification process will use the Electronics Endorsement process to satisfy the prerequisites. For a flier who got their Electronics Endorsement on MR motors, this means that they will have to go through the Electronics Endorsement process again with HPR impulse motors.

**Q:** I've had my Level 3 Certification for some time now, and have been flying with electronics for some time. Does this new requirement mean that I have to go through this whole process before starting the Level 4 process?

**A:** First off, this is not a new requirement for starting the Level 4 Certification. CAR has just never had a formal way of documenting the two required electronics flights.

If you joined CAR and had attained Level 3 Certification prior to August 1, 2005, then you can be "grandfathered" for the purposes of starting your Level 4 certification process. In order to confirm this, please send an email or letter to CAR HQ requesting a waiver of the requirement for the Electronics Endorsement before starting your Level 4 process. Note that this does not change or waive the requirement to have completed two electronics flights before starting your Level 4 project.

If you joined CAR after August 1, 2005 then you will have to get the Electronics Endorsement before starting your Level 4 process.

Revision History:

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Mar 5, 2006 – Shane Weatherill, updated CAR address  
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