3.Q.2 Characteristics

The motor run time will be determined by a maximum energy amount. In addition, motor runs over 20 seconds are regarded as overruns. The energy budget of each model is 5 joules per gram of the total weight. For energy calculations, weight exceeding 550 grams is to be ignored.

Models must have provision for connecting a Static Energy Test (SET) device between the battery and the model's system via 3.5 mm male and female bullet connectors. The connectors from the battery should be male positive and female negative. It is the responsibility of the competitor to supply any adapters needed to connect to the SET.

Energy limitation will be by an energy limiter or by a motor run limit related to measured power.

a) For models with energy limiters. The allowed energy amount starts to be calculated with the ~~launch of the model~~ **release of the start button** and finishes when the ESC has stopped supplying energy to the motor. ~~If the energy limiter does not have the capability of detecting the launching moment it may start its calculation from the beginning of the motor run. The measuring device (EL)~~ **The energy limiter** has to calculate the energy consumed in real time. After coming to the end of the limited energy supply, the motor(s) must stop irreversibly. ~~The energy limiter must interrupt the impulse signal from the timer to the ESC and cuts off the motor(s) in the moment the given energy limit is reached, without need of interaction of other devices. The ESC must always operate via its series connection to the energy limiter and not with direct connection to the timer. The timer stays independent, but the device may inform the timer about the end of the energy supply.~~

For energy limit verification ~~a measurement device is to be used with the capability to start the measurement separately when the start button of the model is released. This device is to be connected between the battery and the model's connectors via 3.5 mm male and female bullet connectors. The measurement device must store the data of time, current and voltage (or wattage). The sampling rate must be 5 samplings per second or better. The energy amount starts to be calculated with releasing the start button of the model and finishes when the ESC has stopped supplying energy to the motor.~~ **a SET is to be connected to the model to allow measurements to confirm the energy used between the release of the start button and until the ESC has stopped supplying energy to the motor. To synchronise the time of release of the start button the model must include a cable connected in parallel with the start button and terminated with a 2-pin 2.54mm female connector. The SET must store and display energy or store the time and power data.**

b) For models without energy limiters ~~the motor's energy in watt-sec over~~ the motor run is calculated as the ~~measured wattage multiplied by the motor run.~~ **allowed energy divided by the measured power and rounded down to the nearest whole second below.** ~~A freshly charged battery (4.15 to 4.2 volts per Li cell, 1.2 volts per NiCad or NMH cells) should be used.~~ After the motor has reached full power, the power is measured ~~using a commercial wattmeter via 3.5 mm male and female bullet connectors furnished by the contestant~~ **with a Wattmeter** at a time equal to the nearest whole second below half the planned motor run. **A freshly charged battery should be used for the power measurement.** The calculated motor run should be clearly marked on the model.

F1Q models may use radio control only for irreversible actions to control dethermalisation of the model. This may include stopping the motor if it is still running. Any malfunction or unintended operation of these functions is entirely at the risk of the competitor.

The number of models eligible for entry by each competitor is four.

Note: the fully amended rule is shown below for clarity:

The motor run time will be determined by a maximum energy amount. In addition, motor runs over 20 seconds are regarded as overruns. The energy budget of each model is 5 joules per gram of the total weight. For energy calculations, weight exceeding 550 grams is to be ignored.

Models must have provision for connecting Static Energy Test (SET) device between the battery and the models systems via 3.5 mm male and female bullet connectors. The connectors from the battery should be male positive and female negative. It is the responsibility of the competitor to supply any adapters needed to connect to the SET.

Energy limitation will be by an energy limiter or by a motor run limit related to measured power.

a) or models with energy limiters. The allowed energy amount starts to be calculated with the release of the start button and finishes when the ESC has stopped supplying energy to the motor. The energy limiter has to calculate the energy consumed in real time. After coming to the end of the limited energy supply, the motor(s) must stop irreversibly.

For energy limit verification a SET is to be connected to the model to allow measurements to confirm the energy used between the release of the start button and until the ESC has stopped supplying energy to the motor. To synchronise the time of release of the start button the model must include a cable connected in parallel with the start button and terminated with a 2-pin 2.54mm female connector. The SET must store and display energy or store the time and power data.

b) For models without energy limiters the motor run is calculated as the allowed energy divided by the measured power and rounded down to the nearest whole second below. After the motor has reached full power, the power is measured with a Wattmeter at a time equal to the nearest whole second below half the planned motor run. A freshly charged battery should be used for the power measurement. The calculated motor run should be clearly marked on the model.

Reason: The 2013 F1Q rules were already complicated and a greater complexity has been added by the 2013 proposals. It is proposed to rationalise the rules and reduce them to simplified requirements on the system requirements for the two approaches.

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