May 1, 2012

Letter to FAA Office of Legal Counsel,

The purpose of this letter is to clarify the industry wide speculation regarding the use of batteries and electric motors in FAR Part 103 ultralight vehicles.

The technological changes that occur within the aviation industry constantly challenge the reading of regulations. Of course this is to be expected since the current technologies were not so much as a dream when the current regulations were written.

With the current state of affairs regarding electric motor technology and the ever improving battery technology, the day approaches when we will see electric aircraft as the standard in aviation. Those of us in the aviation community that are pursuing those technologies continue to debate about the interpretation of the rules that were written before electric powered aircraft were a consideration.

In this request we are specifically asking for an interpretation of FAR Part 103 with regard to the use of batteries and electric motors. Not specifically the interpretation of FAR Part 103 but rather the original intent.

Our reading of 14 CFR Part 103 does not restrict the use of batteries within the aircraft. The limitations are placed upon gasoline in the form of a 5 US gallon maximum restriction.

It is our stance that in an electric powered aircraft the batteries are considered the fuel for power. Just like in a reciprocating engine, gasoline is considered the fuel for power. Fuel is not normally considered part of the empty weight of the aircraft. Additionally, the amount of batteries, just like the amount of fuel, can be configured differently depending upon the flight profile intended. We have thus concluded that under the current definition of empty weight batteries would not be included.

The following is the definition of empty weight from the Aircraft Weight and Balance Handbook FAA-H-8083-1A : Empty Weight. The weight of the airframe, engines, all permanently installed equipment, and unusable fuel. Depending upon the part of the federal regulations under which the aircraft was certificated, either the undrainable oil or full reservoir of oil is included.

Additionally, the development of jettisonable power packs for use with powered sailplanes that when jettisoned from the aircraft remotely pilot themselves back to the point of departure using remotely piloted vehicle (RPV) technology is currently under development. These external reusable stores would certainly not be part of the empty weight of the aircraft.

With regard to the intent of FAR Part 103, we reference back to the preamble under the section titled "Powered Ultralight Vehicles" A maximum power-off stall speed of 24 knots was chosen because it encompasses most of the vehicles currently on the market. The stall speed is easily determined through a simple calculation using information which is readily available to the FAA inspector when inspecting a specific vehicle. The total allowable fuel capacity was raised from the proposed 15 pounds to 5 U.S. gallons. The decision to increase the volume of fuel is a direct result of the desire by the FAA, in response to public comments, to ensure that adequate fuel reserves are available for safe flight.

The statement in the preamble addressing fuel supply is relatively clear. The original proposal was increased by the FAA to five US gallons with the sole intent of providing a power to ensure adequate fuel reserves. When reading the statement it is clear that the intent was to improve safety through increasing the available flight time. We believe that with the current state of affairs with regards to the capacity of current battery storage, limiting the amount of batteries that could be carried aboard an aircraft would only present in impediment towards safety.

We anticipate that the cost and capability of battery storage will likely not exceed the energy density of gasoline for the foreseeable future. As such, we do not recommend placing a limitation on the maximum amount of battery storage capability. Additionally, we believe that placing a restriction regarding the amount of batteries to be carried constitutes a change in FAR Part 103 regulations. We do not recommend a change to FAR Part 103 regulations.

In summary, our current interpretation of both the letter of the law as well as the intent indicates that there is no restriction on the amount of batteries that may be carried on board the aircraft as part of the aircraft useful load. And that the empty weight of the aircraft without batteries remains at 254 pounds.

We would conclude that concurrence with our interpretation would be in the interest of the general public as well as the FAA. The use of electric motors solves many of the problems that have plagued the Part 103 ultralight vehicle community for many years. Issues such as noise, engine reliability, ease of operation, all present a possibility of Part 103 playing a significant role in aviation. The issue of reducing the carbon footprint associated with aviation starts with the smallest of aircraft and will contribute and lead the way to the advances that will be made in larger aircraft in years to come.

The issue of safety can be significantly impacted since the only other powerplants available for these lightweight aircraft are typically two-stroke engines with a dismal reliability and safety record within the Part 103 community. The issue of noise abatement and flying at low altitudes make the electric aircraft particularly suited for this segment of aviation. We believe the FAA has the opportunity to take a stand in concurring with our conclusions that will lead the way and open up opportunities for others to pursue this technology which inevitably will contribute greatly to the aviation community as a whole.

Sincerely,

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