Subject ANPRM RIN2120-AK51 Transponder Requirement for Gliders

This author proposes the rule be **REJECTED** for the following reasons:

Uncontrolled Airspace:

Many gliders operate in uncontrolled (class G) airspace. Some of that airspace may have no radar coverage. Thus, a transponder would only be seen by an aircraft equipped with TCAS / ACAS. Having a transponder would confer no benefit on the glider pilot.

Minimal Equipage:

Some gliders have minimal equipage, perhaps not even a radio. How are these glider pilots to be informed of an airspace conflict?

High Mortality Encounter Model:

Gliders congregate around bodies of rising air. Sometimes these bodies can be localized raising the likelihood of fatal glider on glider encounters. To solve this problem many gliders now carry Flight Alarm (FLARM). Carrying a transponder does not mitigate risk for encounters of this type.

Controller Workload:

Extending coverage to include remote areas increases controller workload. With radar updates many seconds apart and gliders flying in close proximity to one another, equipping every glider with a transponder would likely cause many false positive alarms distracting air traffic controllers or worse causing controllers to become complacent and thereby ignoring real traffic conflicts.

Cost, Size, Weight and Power (CSWaP):

The power requirements of transponders require very expensive RF components for the high power amplifier chain. Many of these parts must be custom built adding thousands of dollars to the price of a transponder. Large, heavy batteries may be insufficient for long duration, cross-country flights. FLARM is much more affordable because it uses low-power, widely available components. The disadvantage of FLARM is that it is not widely supported in the general aviation community.

A Better Alternative:

At the UAS Traffic Management (UTM) workshop held at NASA Ames Research center on Apr 14-15 2015 NASA identified low CSWaP sense and avoid technology as a critical research gap for UAS operating beyond visual line of sight. My company proposed ADS-B Lite, a FLARM like variant of ADS-B with a low power requirement. Google has a well funded initiative to bring down the cost of ADS-B ($90) by using low power components and is promoting its own ADS-B Lite. As a workshop conclusion, NASA issued a recommendation that a new low-power classification be created. (e.g. a class A0 Lo with power on the order of one to six watts). This would not meet the requirements of a transponder; however, the DO-260B MOPS allows for transponderless operations using downlink format DF-18. Equipping gliders

with an affordable transponderless ADS-B solution solves the issue of cost, size, weight and power; would provide collision avoidance guidance in the glider on glider encounter model (like FLARM) as well as the glider on general aviation encounter model (like the Minden accident); would do this in remote areas where there is no radar coverage and due to the short range would likely not overburden controllers. Moreover, at low altitudes it could help provide safe separation between gliders and UAS by integrating with NASA's UTM.

CONCLUSION:

The rule the FAA should be making is the creation of a low power interactive class (A0 Lo) for operations of Category Set B (low and slow) emitters. (Category set B includes gliders, balloons, parachutists, ultra-lights, hang gliders, UAS, etc. See DO-260B Minimum Operational Performance Specifications). For glider operations above 10,000 feet, let the ADS-B 2020 mandate apply to gliders but allow it to be LOW POWER and TRANSPONDERLESS. This would confer a real benefit at an affordable price and do much more to promote aviation safety than equipping gliders with heavy, expensive transponders that confer little or no benefit.

Signed

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