

Darryl Ramm

Notes about failed ADS-B Performance report

I'm not sure what is going on here. Was the FAA pointing out your system was not compliant or had you contacted them for help thinking it was not working correctly? This stuff is as clear as mud so it's not surprising this is not easy to understand. The FAA sure could have made it easier if PAPER directly supported reporting whether TABS systems were working OK or not. But then the FAA developed TABS and basically did nothing else to support it. I've asked Leidos (FAA's ADS-B systems integrator who built PAPER) engineers recently about doing that and they just laugh. Good luck... not in the plan.

I'm assuming you have a TN72 so this is all working as expected. TSO-C199 requirements are SIL=1, SDA=1 and NIC=6. Which is what you are seeing. You will see values lower than those when the GPS does not have a fix.... like if you power up on the ground and there is ground coverage from an ADS-B Tower. Unfortunately PAPER reports are not designed to test TABS so things like the KMZ google earth files which are normally very useful are less useful here because all the valid TABS fixes are marked as red errors, but you can mouse over those points to see the raw data or look through the spreadsheet the FAA can provide if asked and look at when any SIL=0 etc. data points occur. Likely not worth doing, but being anal retentive I'd do it just to be totally sure stuff is working really well... i.e. see where those SIL=0 data points are, you don't want to see any sustained GPS dropouts in flight then you may see SIL=0 or NIC below 6, a few brief dropouts when thermalling very tight may be expected.

If you had been approached by the FAA and they are just confused I'd normally reply with something like... (and if FAA folks seem particularly lost you can copy me on the email as somebody who understands ADS-B and TABS).

Dear XXXX

Thank you for your email/letter dated <DATE>.

I am aware that Alexander Schleicher ASH26E glider N66DY has a 1090ES ADS-B Out install that is transmitting SIL=1, SDA=1 etc. and that this system does not meet the requirements of 14 CFR 91.227. This is a TSO-C199 Traffic Awareness Beacon System (TABS) install and is not intended to meet 14 CFR 91.227 requirements and not intended to provide flight privileges in 14 CFR 91.225 ADS-B Out required airspace (and as you are likely aware gliders also have requirement dispensations for some of the airspace described in 91.225).

I believe the Mode-S transponder and TSO-C199 system installed in this glider provides significant safety improvement from improved traffic awareness and collision avoidance capabilities provided to this glider and to other compatible equipped aircraft operating nearby.

Regards

<Your NAME>

If you have been pinging the FAA for help with this thinking it was not working, well I'll leave you to write that email :-). But even then it's disappointing that the FAA rep did not understand glider with SIL=1 likely means TABS working as expected.

The benefits you get from TABS

1. Your glider is directly visible to all airborne 1090ES In systems (if it was instead just using any consumer GPS aka SIL=0) your 1090ES Out position reports would be discarded by all certified ADS-B In systems.
2. When within coverage of ADS-B ground towers your glider will be a client of the ADS-B ground system and provided with TIS-B and ADS-R services (and I note you have 1090ES In configured in your setup (good), so hopefully you have a PowerFLARM with the ADS-R/TIS-B option (or a FLARMFusion). If you are not sure that's working, the FLARM log provides some diag info, you can send to me. (And if you use UAT-In devices we should talk).
3. When within coverage of ADS-B ground towers your glider will be an ADS-R target to properly configured UAT-In aircraft (i.e. they see a more accurate position info and have coverage over a wider area compared to without TABS (or 2020 Compliant ADS-B Out) other UAT In client aircraft would only see your glider position via TIS-B using SSR derived position data and then only when your glider is within SSR coverage.
4. Presumably folks can pull up PAPER or reports from commercial tracking services in the event you are missing and that may help locate you, but maybe not quite as nice as ATC controllers having more direct visibility of you in areas outside SSR coverage. (but please don't rely on ADS-B for this, a Garmin inReach is a better option... but if something bad happens ADS-B is worth looking at, as are FLARM SAR capabilities).

Limitations of TABS vs. 14 CFR 91.227 complaint systems

1. This does not give you any flight privileges in any of the airspace described in 14 CFR 91.225 outside of the standard glider exemptions. (A) Flights in Class B or C airspace, (B) flight over the top of Class C airspace but below 10,000', (C) Flight within mode-C veils where more complex Class B or C airspace tops define a lower maximum allowed operating altitude -- often misunderstood, and example issues happen at SFO and SEA mode C veils, (D) Flight in wave windows -- what is required here depends entirely on the wave Window LOA, pilots may be taking risks if an LOA does not specifically exclude the need for 2020 Compliant 1090ES Out.
2. ATC controllers do not see your glider via ADS-B Out, if you are within SSR coverage they will see your transponder but if outside SSR coverage ATC will not see you via ADS-B Out. (you can check this with your local controllers, but there is no easy way to display if the ADS-B

Out os 2020 Compliant or nto to controllers, so the TRACONs I've seen all just don't show anything except SIL=3/2020 Compliant targets).

And again if you want a 14 CFR 91.227 compliant ADS-B Out system you A&P IA needs to follow FAA technical note AFS-360-2017-1, they will need to use a Trig TN70 GPS with a TT22 transponder and follow at least the relevant interconnect and software configuration instructions in the Peregrine/Trig STC for a TN70/TT22 install.

I normally recommend that A&Ps installing TABS system placard the glider with something like "TASB/TSO-C199 installed in this aircraft does not meet 14 CFR 91.227 performance requirements and does not provide flight privilege in 14 CFR 91.225 ADS-B Out required airspace."

And since you have a TABS system there is no need to transmit ground mode ADS-B Out messages, so the simplest=best=most reliable install is to not use a pitot/squat switch and in the TT21/TT22 setup menu set that there is no squat switch (and definitely do not set that to switch based on GPS ground speed).

Darryl