



Summary of Public Submissions Received on

Draft CAA Notice NTC 91.258 Revision 3

16 August 2022

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General

Draft CAA Notice NTC 91.258 Revision 3 (the draft Notice) was issued for public consultation on 24 June 2021, and consultation closed on 16 July 2021. The primary purpose of the draft Notice is to allow glider maintenance engineers authorised under Part 149 by a gliding organisation (glider engineers) to install ADS-B systems on gliders only.

Due to other time sensitive and pressing Rules' work and with limited resources, the progression of this proposal was temporarily put on hold.

The CAA regrets any inconvenience caused as a result of the prolonged delay in finalising the proposal.

Summary of Submissions

A total of 21 submissions were received. Of these, 11 submissions were from organisations, and 10 were from individuals. Eleven of the submissions did not find the proposal acceptable at all. Nine of the submissions found the proposal not acceptable but would be acceptable if changes suggested by them were made. The remaining one submission found the proposal acceptable without change.

From the submissions received, a number of issues were raised regarding the proposal. These issues have been grouped under the following 4 categories:

1. Quality of work completed by glider engineers, including safety of installations and potential outcomes;
2. Engineers approved by Part 149 organisations do not meet Part 66 requirements/training;
3. Precedence setting and the dilution of the importance of Radio Group 3 category; and
4. The financial implications for Radio Group 3 rated engineers.

Each of these categories is discussed below.

Issue 1 - Quality of work completed by glider engineers, including safety of installations and potential outcomes

Several submitters opposed the proposals on the basis that previous avionic work (not just transponder or ADS-B installations) completed by glider engineers was considered as sub-standard or were not completed in accordance with manufacturer installation manuals.

For instance, a submitter expressed that in his working experience regarding Mode A/C installations carried out by glider engineers, the quality of installation has been poor in almost all the installations he witnessed. The submitter further added that he tested transponder equipment that had failed the required tests. However, the same equipment was re-tested by a glider engineer without rectification and the transponder system was passed. The submitter concluded that he has no confidence that ADS-B installation or testing will be carried out correctly by glider engineers.

Another submitter raised his concern that not only are there issues regarding testing and certification of ADS-B equipment or systems, but he doubts whether the tooling that is used to carry out the installations is appropriate. The submitter's view is based on what he has seen that *"there is very little control currently over who or what gets fitted to gliders and I have personal experience of glider owners telling me of the "stuff" they've fitted themselves"*.

Taking the matter further, several submitters raised concerns regarding the safety risks resulting from installations completed by glider engineers, and the potential outcomes of poorly or incorrectly installed equipment. As a submitter bluntly summarised it, *"if ADS-B system is installed incorrectly, it can cause major issues with the ATC, and in a severe case scenario – loss of life"*.

A submitter expressed that the CAA either has a rule that requires a 'suitably' qualified person to be certified to install ADS-B on all aircraft or it does not. It is not desirable from a safety perspective to have 'mixed' modes. The submitter queried as to how a glider can be considered as less harmful in a mid-air collision with a fully laden Airbus A380, due to its installed ADS-B OUT function providing erroneous positional information than any other aircraft? Another submitter asserted that improperly operating installations will result in potentially unsafe operations as aircraft used are not airworthy and will broadcast errors in the national airspace.

In support, a submitter noted that programming the units, which require specific cabling and software, can go horribly wrong if the wrong information is programmed into the unit. This can cause issues for ATC if gliders are to operate in the circuit with its transponder transmitting wrong information. The submitter contended that at its worst case, this could potentially result in a mid-air collision.

Another submitter raised a concern that an accurate electrical load analysis is very important to ensure that the owner or operator is aware of the time the person is able to operate the electrical equipment for. The submitter queried as to what parameters or guidelines a gliding organisation will put in place to ensure that this work is done by a competent, not just an authorised, person.

A submitter shared his concern that giving people or groups a pathway around the rules would reduce the safety culture and open up avenues for others to seek an exemption from the already approved way of maintenance which is already in place, in order to save money.

Finally, a submitter questioned whether the Gliding Association will be required to buy approved ADS-B test equipment such as the IFR6000 (valued at \$27,000.00), and a pitot/static test set (valued at \$6,000.00), to allow the approval holders to ramp test their installations.

CAA Response

The CAA has carefully considered the concerns raised regarding the quality of installation or maintenance work performed by glider engineers. The CAA advises that, to its knowledge, there is no documentary evidence specifically relating to gliders or Part 149 authorised personnel of this occurring. If there are concerns about installations these should be reported to the CAA, as required, under the reporting mechanisms provided in Part 12, or as an aviation related concern.

With regard to ADS-B installations not being completed in accordance with manufacturer installation manuals, CAA has no evidence of this occurring either through the CAA005 process or aviation related concerns. Furthermore, no evidence of installations affecting safety outcomes has been provided.

It must be noted that ADS-B is a traffic awareness system, and while an erroneous position being reported is undesirable this would not have a direct effect on aircraft collision avoidance systems, which do not use the ADS-B message data. As such, the risk of a mid-air collision will not be significantly increased by incorrect installation or configuration.

As glider engineers are authorised by a Part 149 organisation, and the Director has approved the exposition of the Part 149 organisation (including all relevant requirements), the CAA considers any safety risks associated with allowing appropriately authorised glider engineers to complete installations on gliders, to be minimal.

Issue 2 – Engineers approved by Part 149 organisations do not meet Part 66 requirements or training

Several submitters provided feedback on the differing training that Part 66 engineers and engineers authorised by a Part 149 organisation are required to complete. In particular, it was contended that the proposal does not require glider engineers to meet the Part 66 requirements or training standards, thus failing to meet minimum safety requirements that Part 66 is designed to uphold.

A submitter contended that the proposal should include the minimum knowledge, skills, and abilities, such as system and installation training, that the glider engineer must meet before the gliding organisation may approve the individual. Furthermore, the gliding organisation must verify that the proper test equipment is available and used during the installation. Another submitter added that to properly install and return to service an

aircraft following an ADS-B system installation, required specific knowledge, skills, and abilities must be evaluated and approved for the individual engineer. Also, to properly return to service the installation, the engineer must have and use the proper test equipment.

A submitter queried as to what experience parameters a Part 149 gliding organisation would have in place to allow an engineer to carry out ADS-B installations. In his view, if a gliding organisation wanted an engineer to perform these installations then a LAME with a Radio Group 3 Rating should be the minimum requirement for them to issue an authorisation.

A submitter assumed that the proposed change has been requested by Gliding NZ. In his view, the submitter contended that the problem with the proposal is that Gliding NZ issues approvals to engineers for avionic installations around a list of criteria that does not mention any form of avionic experience or qualification. With a level 4 approval, the privileges allowing the installation of radio and transponders with the issue of a radio rating may be obtained with "sufficient knowledge of radio transmitting devices used in gliders..."etc. The submitter noted that there is no mention of how that knowledge has been obtained or demonstrated as is the requirement under Rule Part 66 for a licensed Engineer to obtain a Radio Group 3 Rating to carry out that same type of transponder installation.

Another submitter commented that the average glider engineer's tool kit may lack some of the equipment which every LAME would have in his tool kit. For instance, wire strippers and correct crimp tools for the standard and high-density connectors.

CAA Response

The CAA advises that any authorisation to be issued will be in accordance with a Part 149 exposition as accepted by the Director. This means that before the Director approves an exposition, the Director will need to be satisfied that all the relevant requirements for a Part 149 organisation exposition have been met. This includes requirements relating to maintenance performed on a glider.

Part 149 organisations are allowed to issue their own authorisations in accordance with their expositions. This has been in place for avionics installations for many years. The CAA has no record to indicate this resulted in a negative outcome to aviation safety; at least not via the CAA005 reporting process. Part of the authorisation issue is an assessment of knowledge and experience.

Additionally, the current Notice already expands on Part 66 requirements to the Part 66 LAMEs as well, where ADS-B systems (consisting of a transponder and GNSS) require a LAME Radio Group 3 rating, while GNSS systems on their own require Radio Group 2. (Note that these can be gained independently and there is no prerequisite on having Radio Group 2 prior to Radio Group 3).

A relevant factor that has influenced the CAA's decision making is that ADS-B is a relatively new development in avionics and no evidence of training and experience was/is required for those who had their avionics ratings prior to the introduction to ADS-B.

Issue 3 – Precedence setting and the dilution of the importance of Radio Group 3 category

Several submitters raised their concerns that the proposal would set a precedent for other engineering groups to lobby the CAA to allow them to exercise a similar privilege. As a submitter summarised it - “this amendment has the potential to open a can of worms. The CAA is bending to pressure from a minority group who authorise their own maintenance staff who do not have to meet the requirements to become a LAME, which will, as already stated, open them up to pressure from the other minority groups within the aviation community”.

Another submitter understood that a glider is a standard category aircraft according to the Civil Aviation Rules. From his viewpoint, if the proposal is carried through, what is there to stop airframe rated LAMEs, microlight engineers, amateur built aircraft owners, and mechanical license holders to use this basis as a valid ground to seek the same privileges.

In addition, a submitter voiced his concern that if the proposal is finalised to allow glider engineers to install ADS-B on gliders, mechanical LAMEs are likely to have their extended privileges reduced. These LAMEs have many years of experience in installing electrical and avionics equipment under AC43-14. This is an insult to the many capable mechanical LAMEs.

Four submissions referred to the dilution of the importance of the Radio Group 3 rating and of the training involved to obtain this rating. In a submitter’s own words, *“this proposal makes a mockery of young people entering aviation by paying to attend training courses run by training organisations such as NMIT or Air NZ, paying to sit basic license exams, paying to sit rating exams and the requirement of 2 years’ experience for the issue of a rating”*.

Furthermore, a submitter queried whether the CAA will be vetting the ‘authorised’ person’s credentials and what level those would need to be, in view of the submitters own experience where he sat 10 written and 2 oral exams and submitted in excess of 4 years of experience to obtain his licence and rating to do such installations.

Another submitter shared a similar sentiment when he considered the amount of time spent training, studying, and undergoing exams in order to exercise the privileges to install or repair ADS-B equipment, and sign them off. In addition, a submitter reiterated similar concerns mentioned earlier, with regards to which group will be the next one to demean the value of a group 3 Radio licenced engineer. Finally, a submitter voiced his disappointment that if the proposal goes ahead, that would effectively mean that all his efforts and time spent on getting his licence were in vain.

CAA Response

Gliding organisations already have the internal authorisation processes that the Director has accepted, to install avionics systems that may otherwise be covered by a Radio Group 3 rating. ADS-B is the only limitation in place by the Notice, therefore the suggestion that this amendment ‘dilutes’ the Radio Group 3 category is not necessarily accurate as Radio rated gliding engineers are already authorised to complete other avionics installations.

Furthermore, the proposed amendment to the Notice only provides glider engineers to install ADS-B systems on gliders only. As a limited number of ADS-B installations on gliders had been completed by Radio group 3 rated LAMEs at the time of the consultation (less than 10), the CAA considers the small scale would not have adversely affected those engineers.

With regard to setting a precedent that other organisations may follow, any other organisation can request the Director assesses the situation in relation to their own organisation. However, any further determinations will be made on a case by case basis - assessments and the outcomes are not predetermined. This is not simply an ADS-B related issue, and the process is in effect across multiple other areas.

From an aviation system perspective if the Notice permits glider engineers to carry out ADS-B installations, and those installations pass the existing testing requirements, then there will be a net increase in the number of ADS-B equipped gliders. This will ensure a net safety gain to the aviation system. The effect of issuing the Notice needs to be contrasted with the existing arrangement under which very few installations have been carried out by LAME, despite their ability to do so.

Issue 4 – The financial implications for Radio Group 3 rated engineers

While fewer submissions were made relating to this issue, it was still made clear that the potential reduction in work would have financial implications on those engineers that have obtained the Radio Group 3 rating, and purchased additional equipment that is, or is seen as, necessary to complete ADS-B installations and testing.

For instance, a submitter highlighted that avionic companies have spent hundreds of thousands of dollars on sending personnel for training courses run by the manufacturers of ADS-B equipment and spent thousands of dollars a year to calibrate ADS-B test equipment and pitot/static test sets. The submitter queried whether the Gliding Association would accept the automatic loss of warranty that will occur, plus accept the loss of insurance cover. Another submitter rationalised that the majority of the glider owners will want a glider maintainer to complete an ADS-B installation because it will probably be cheaper than using a licensed engineer.

Finally, a submitter expressed that if the proposal goes ahead, the submitter will refuse to test any gliding installations the submitter has not carried out himself.

CAA Response

While the CAA appreciates this concern, this is more of a commercial issue than a safety issue. As such only limited commentary can be made.

The CAA investigated the number of ADS-B installations that had been carried out when the proposal was released for consultation – at this time less than 10 gliders had been detected with ADS-B. As only very few glider installations had been completed at this stage, plus the lack of widespread acceptable technical data being available, the effect on Radio Group 3 rated engineers was considered negligible.

The Notice still requires appropriate testing, with the necessary testing equipment, to be carried out following installation. Glider engineers will be required to obtain the necessary rating, and testing equipment, to carry out the tests – very few glider engineers are currently rated to do so. Therefore, the testing requirements may be contracted to Group 3 rated engineers potentially increasing the work available, although the final submission listed above is noted.

Recommendation 1 – Part 149 should be revised to align with Part 43 and Part 66 maintenance requirements

A recommendation suggested by several submitters, which would make the proposal more acceptable, was for Part 149 to be revised to align with Part 43 and Part 66 maintenance requirements. This view was captured by a submitter as follows:

“Rule 149.51(b)(1) falls short of rule 145.60 in terms of detailing what a Part 149 organisation would need to do to satisfy itself that the person it was issuing the approval to has the sufficient knowledge and experience to perform the function. The 149 rule describes very loosely what the certificate holder needs to do to establish and maintain competence. It makes no reference to Part 43 maintenance or Part 66 rules. The 145 rule provides detailed requirements that are integrated with the Part 43 and Part 66 rules. Part 149 should be re-written to include some more appropriate references to Parts 43 and 66 before using it as a means to allow glider engineers to save a few dollars.

To release the Notice as is would be a mistake that is going to open CAA up for criticism and possibly set a precedent for microlights and LSA aircraft getting transponders installed under the same terms. The submitter does not disagree (in principle) with allowing Gliding organisations to do their own installations and testing. However, it would be appropriate to put in place a system of monitoring and control that would ensure that the installations are performed to the same standard.”

CAA Response

The CAA clarifies that the Part 149 authorisation system is not introduced by this CAA Notice. It is currently in existence, and has been for many years, and avionics installations have been carried out under these provisions throughout this time. The CAA still need to be satisfied that all requirements are met before issuing a Part 149 certificate. This includes approving the necessary documents such as the exposition, manuals and operating procedures.

Furthermore, although the rule wording may be different, the authorisations still have to be issued in accordance with an exposition that is approved by the CAA, and the Part 149 organisation should issue authorisations in accordance with their policy and the procedures set out in their exposition (including the setting of both requirements for issue of the authorisation and for monitoring and control).

The Part 149 authorisation system offers no relief on any certification standards or use of acceptable technical data, and installations must still be carried in accordance with these requirements.

The CAA advises that recommendation 1 will not be adopted.

The CAA also advises that any wider issues with Part 149 in conjunction with Part 43 and Part 66 is outside the scope of this consultation.

Recommendation 2 – A Radio Group 3 rated engineer should be involved at some stage of the ADS-B installation process on a glider

Another recommendation made by at least a couple of submitters which, in their view, would make the proposal more acceptable, is that a Radio Group 3 rated engineer should still have some oversight of the ADS-B installation process in a glider.

A submitter contended that if the CAA were to proceed with this amendment to allow glider engineers to install ADS-B, then testing and certification of that testing must be carried out by a Group 3 LAME with the correct test equipment to maintain the standard of systems detected by the Airways network. Another submitter noted that gliders operate at altitudes greater than 24500 feet. He queried as to what safeguards there are to ensure that the correct equipment is installed if there is no Group 3 LAME oversight to ensure equipment selection is correct. In addition, a submitter voiced his support by stating that *“I am in full agreement that this work needs to be at minimum be checked out and signed off by a group 3 radio rated engineer”*. Whilst another submitter suggested that it would be possible to utilise the authorised glider engineers to carry out the mechanical installation of the components in consultation with the certifying avionic LAME.

Alternatively, suggestions were made by submitters that the simple fix is for GNZ to require their engineers to obtain an AME license with the appropriate radio or instrument rating. In any case, submitters were of the view that the avionics in modern high performance gliders should require this level of radio/instrument knowledge. Given the fact that motorised gliders are powered aircraft in the same way as any other aircraft with an engine, these must be treated as such - therefore the need for a Group 3 LAME. Finally, a submitter contended that all wiring, programming, and testing should be done by a Group 3 rated LAME.

CAA Response

As mentioned previously, Part 149 organisations can already issue authorisations for avionics installations - many gliders have a Mode-S transponder fitted already under these provisions, where the correct equipment use, as required by Part 91 Appendix A.22(2), is determined by the Class under TSO-C112 (which is applicable to Mode S transponders) and no concerns with ATC have been noted. As ADS-B Systems under the New Zealand rules are based on, and still require, a TSO-C112 (or equivalent) transponder, the CAA has no evidence to suggest that this will be an issue. The limited number of installations that have been completed to date also show no issues.

Additionally, to avoid any confusion, the CAA notes that the requirement for Class 1 equipment exists above 15,000 feet (or maximum cruising true airspeed in excess of 175 kt) as documented in TSO-C112. As such, gliders operating above 15,000 feet within compliance should pose no increased risk above FL 245.

To reiterate, the testing requirements for an ADS-B system following installation remain. Due to the specialist equipment and necessary rating being required to carry out these tests it is likely that a Radio Group 3 rated engineer will be involved at this stage.

Recommendation 3 – proposal could be acceptable if GNZ specific class and rating of engineer is included

While many submitters saw the proposal as completely unacceptable, a few raised how the proposal could be acceptable if the specific class and rating of a glider engineer, approved under a Part 149 organisation, was made clear.

As summed up in the submissions – *“there is a clear line as to who can and cannot carry out these installations. Which glider engineers can complete ADS-B installations ‘needs to be put into the NTC in plain English so that there is no confusion and proof of this test and certification should be a prerequisite’.*

CAA Response

After carefully considering recommendation 3, the CAA advises that it is not necessary or appropriate to further amend the proposal to specify the class and rating that a glider engineer, authorised under Part 149, is required to have obtained.

This decision was made on the basis that the CAA believes that the existing regime in place (oversight via the exposition approval process) provides adequate safety assurance. Furthermore, the testing requirements remain and are unchanged – the necessary equipment and rating to complete testing is still required.

The CAA advises that recommendation 3 will not be adopted.

Recommendation 4 – Clarifications in amendments to tables

The following recommendations were put forward by submitters to better clarify intent and correct editorial errors regarding some areas of the Notice, and the tables for the message set elements.

1. Table 1 – Message Set Elements for TSO-C166(b) Transponders (new or replacement) and compatible GNSS (Refer to F1) – this is incorrect and should be amended to ‘2(f)(1)’.
2. What does the ‘F1’ in title refer to? If this is supposed to refer to the ADS-B System Standards for Transponders then it should read “...(Refer to 2(f)(3))”
3. ADS-B Capability. Add “1090ES IN” to Message Element description. Aligns with Table 2 Message Element for 1.1
4. 1.9 GNSS Antenna Offset. Delete “(POA)” from Message Element. POA is the abbreviation of Position Offset Applied which is now in row 2.0. This aligns with Table 2 row 1.9

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5. 2.9 Latitude and Longitude (Surface). Change reference in Meaning from 2.7 to 2.8. Message Set references were updated but this cross reference was not. Now points to IDENT for Meaning.
 6. Table 2 – Message Set Elements for TSO-C166() or TSO-C166a Transponders – Existing (refer to F(2) and (3)). What does the F(2) and F(3) in title refer to? If this is supposed to refer to the ADS-B System Standards for Transponders then it should read “...(Refer to 2(f)(1) and 2(f)(2))”.
 7. Tables would be easier to read if they were both combined into a single table like the existing Table 2 with a new column for DO-260B.

CAA Response

The CAA responses below correspond to the sequence of the recommendations above:

1. Agree to amend reference to read ‘2(f)(1)’. This error has been in existence since the original release of NTC91.258.
2. This reference is in Table 2. Agree to amend reference to read ‘2(f)(2)’ and ‘2(f)(3)’.
3. In row 1.1 of Table 1 - instead of adding ‘*1090ES IN*’ under the heading ‘ADS-B capability’ to the message set description, the heading is amended to read ‘ADS-B IN capability’. This would better clarify intent.
4. Message 1.9 applies to DO-260B only (Table 1). Message 2.0 applies to DO-260A only (table 2). The lines are repeated in both tables to ensure continuity in numbering. The difference is that 1.9 has a value in meters, 2.0 does not. Therefore, they are slightly different messages and two separate lines will be retained with the existing descriptions.
5. Agree to amend reference ‘2.8’ to ‘2.7’, in Table 1, row 2.9 (Latitude and Longitude (*Surface*)).
6. Agree to amend reference ‘F(2)’ and ‘F(3)’ to read ‘2(f)(1)’ and ‘2(f)(2)’, in heading of Table 2.
7. An editorial decision was made not to combine into a single table to minimise confusion. Table 1 will be the only relevant table for any ADS-B systems fitted after 31 December 2018.

Recommendation 5 – Amend reference at 4(3)(b) to ‘ADS-B system’ from ‘ADS-B transponder’

A single suggestion was made to amend the reference in clause 4(3)(b) to read

‘An ADS-B **system** must be installed by....’

This ensures that it is clear that the full ADS-B system should be installed and tested by the appropriately authorised engineer. Simply referring to an ADS-B transponder could cause misinterpretation of an ADS-B system and the installation requirements.

CAA Response

The CAA accepts this recommendation and will make the necessary amendment to ensure continuity throughout the Notice.