

**SPORT AVIATION RESPONSE TO:
Joint Consultation Paper (JCP): Transition to Satellite Technology for Navigation and Surveillance**

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EXECUTIVE SUMMARY

Sport Aviation understands that satellite technology for navigation and surveillance is the way of the future and accordingly, supports appropriate application of this technology in Australia.

Sport Aviation expects that the implementation of this technology will be subject to risk management and cost benefit justification as required by the Australian Airspace Policy Statement (AAPS).

Sport Aviation will support those parts of this initiative which can be justified. Sport Aviation believes that extension of the ADS-B mandate beyond that required for replacement of SSR radar required by capacity needs, cannot be justified and is implacably opposed to this extended mandate.

Sport Aviation believes that implementation of some important aspects of this new technology has been stalled by an almost ideological push for this unjustified extended mandate. This objective has been pursued by attempting to combine the separate aspects of this technology into a single decision, using the benefits from other cost beneficial aspects of this technology, to fund a wide mandate for ADS-B OUT.

It is very unfortunate that the JCP seems to be no more than a continuation of this approach.

Sport Aviation notes that the JCP promises that the second stage of the proposal involving an extension of the ADS-B mandate into Class G airspace 'will be subject to a risk management and cost benefit justification' but points out that this is not acceptable. The very essence of a risk management approach is that it is not 'tacked on at the end' after the decision has been made; but it is an integral part of the decision making approach

A risk management and cost benefit justification is a systematic, rigorous, quantitative means of deciding what actions can be justified. It starts with the problems or hazards to be solved or mitigated, canvasses all possible solution or mitigators and determines which of these can be justified by the outcomes achieved. It is fundamental to the rigour in this approach that the cost benefit study must include only those benefits resulting from the mitigator under consideration and that all costs associated with the implementation of that mitigator must be included.

This approach has never been attempted by the ABIT team (responsible for the development of ADS-B application in Australia) apparently responsible for this JCP.

Sport Aviation believes that analysis of the work carried out by the GIT (Responsible fore the development of GNSS Navigation in Australia) and ABIT teams shows that the implementation of GNSS Navigation and the replacement of SSR with ADS-B to provide radar-like services, where required by capacity needs of the ATM system, has been justified; but that this study has already shown that the extension of the ADS-B mandate beyond that required to achieve these outcomes cannot be justified on a risk management and cost benefit basis and further, that the ABIT team agreed this fact at the last ABIT meeting.

Sport Aviation will agree any requirement which can be justified, but is implacably opposed to any requirement which cannot. Further, Sport Aviation will not agree to an exemption from a costly requirement based on inability to power, when the requirement itself cannot be justified for anyone.

DETAILED COMMENTS

The Discussion Paper

Much of the discussion paper obfuscates or simply avoids the decisions facing the Industry by proposing that this technology must be implemented as a single decision. This effectively asks the question – ‘Will Australia implement GPS based avionics or not?’ but avoids the real issues, which are – which aspects of this technology, where and by whom?

The paper proposes that the decision is a single issue on the transparently thin argument that there are cost savings if the avionics installation is done simultaneously and that aircraft operators might be more likely to install other GPS based avionics if they are forced to install ADS-B OUT.

Even if the installation of GPS avionics in individual aircraft is to be carried out in a single step it is a non sequitur to say the decision as to which capabilities need to be installed in which aircraft must also be a single global decision.

If it is a single global decision then, clearly, Australia must be part of this new technology – but the fallacy is the assumption that it is a single global decision. Accordingly, the primary outcome of this JCP is not a result of this analysis but is actually assumed in the starting assumptions of the analysis.

Risk Management Justification

Attached (Appendix A) is an analysis of the decisions facing the industry submitted by Sport Aviation as input to the discussion paper. This analysis is based on the work done by GIT and ABIT. This submission was apparently entirely ignored in the preparation of the current JCP.

Clearly, the Industry faces at least four decisions – each of which is, technically and conceptually, an independent issue; each with its own benefits and implementation costs. The only connection being they are, or may be, addressed by GPS based technology. Thus –

1. GNSS Nav. aids or not.
2. Replacement of SSR with ADS-B where capacity requirements justify a radar-like service.
3. Recommendation or mandate of avionics required to avoid CFIT accidents.
4. Extension of the ADS-B mandate beyond radar coverage justified by capacity requirements.

These are the reasons for considering a requirement for GPS based avionics. The analysis must start with these reasons – canvas all possible solution or mitigators and depend on a cost benefit analysis to determine which of the mitigators can be justified.

Points, 1) and 2) are business decisions. R&D by the GIT and ABIT teams have demonstrated that these new technologies are as good or better than the older technology and are more cost effective. Points 3) and 4) are mitigators designed to deal with identified hazards.

Analysis of the work done by the GIT and ABIT teams shows the following:

1. GNSS Nav. is clearly justified by the savings achieved.
2. Replacement of SSR as described in the JCP, is clearly cost beneficial and probably justifies some cross-subsidy of the cost of installation of ADS-B OUT in GA aircraft because the proposal disposes

capital investment from the ATM provider to GA. This should be an ongoing subsidy, not a one off subsidy, as the cost savings to the 'big' end of town are ongoing.

3. No systematic attempt has been made in these studies to address the avionics which may mitigate CFIT accidents except that it is clear that mandating ADS-B OUT will have no effect on this significant accident type.
4. Cost benefit justification of the extension of the ADS-B mandate beyond that required for radar-like services justified by capacity requirements, must stand alone. The benefits included must be limited to those which are a result of the extended mandate (ie depend on the fitment of ADS-B OUT in other aircraft in regions where radar-like services cannot be justified for capacity reasons) – and costs include all those required to achieve those benefits. (See following)

Cost Benefit Justification of Project B – Extension Beyond SSR Replacement

A detailed analysis, by Sport Aviation, of the shortcomings of the ABIT cost benefit analysis, which was accepted by ABIT and ASTRA but, despite assurances given Sport Aviation, has not been addressed in this updated cost benefit analysis, is attached (Appendix B).

In summary this shows:

- * GNSS Nav. and avoidance of CFIT accidents are not outcomes of fitment of ADS-B OUT.
- * Savings on SSR by replacement with ADS-B similarly do not depend on a mandate extended beyond radar coverage justified by capacity requirements.
- * Search and rescue benefits do not require ADS-B OUT in other aircraft.

Accordingly, none is a benefit of the extended mandate.

- * Collision avoidance depends on ADS-B IN as well as ADS-B OUT

Accordingly, if this benefit is to be included, then the costs must include fitment of ADS-B IN as well as ADS-B OUT.

On this valid basis, extension of an ADS-B OUT mandate beyond that required for replacement of SSR with ADS-B, falls well short of being cost beneficial and, accordingly, cannot be justified on a risk management basis (See Appendix B for more details). This proposal then cannot be implemented under the AAPS.

This result applies whether or not a means of funding these costs can be found.

A Reasonableness Test

Finally, the outcome does not pass a 'reasonableness' test.

The extended mandate is for Class E and for Class G above 5000' – this exclusively *en route* airspace where the collision hazard is vanishingly small. This is a return to the dark ages of mandatory radio above 5000' (with no protection in terminal airspace).

It is claimed that this will remove reliance on unalerted see-and-avoid in terminal airspace. This is a false claim as the proposal mandates ADS-B OUT for aircraft already required to carry and use radio and a transponder. This would add a third mitigator against this hazard.

Finally, it would appear that there is still no intention to mandate ADS-B IN for RPT aircraft in the same airspace. (The ADS-B OUT units may well be bleeping at no one.)

Cost Benefit Calculation Attached

Finally, the cost benefit study attached to the JCP is in fact more misleading than that previously rejected by Sport Aviation and the Board of Airservices and is, again, rejected by Sport Aviation and should be by all of the industry.

The study does not distinguish the clearly separate projects involved. It assumes that savings from one project can be used to justify costs for another.

Put simply, the approach by ABIT has always been that the technology must be implemented because it is technically superior. Any analysis of costs and benefits has been an attempt to work out 'how we can afford this great technology we have developed' – not to decide where its implementation can be justified.

If the exercise is to find a way of funding a project which has already been agreed, then this might be considered acceptable. However the AAPS requires a risk management and cost benefit justification for such an airspace change.

If this requirement is to be honoured, then the purpose of the examination of a mitigator as part of a risk management justification, is to determine whether the implementation of this mitigator is justified by the outcomes achieved. Clearly, then the cost must include all the costs required to achieve the outcomes and the value of outcomes must be limited to those actually produced by that mitigator.

The analysis attached the JCP calculates benefits which either do not depend on the fitment of ADS-B OUT in other aircraft (GNSS Nav., CFIT and search and rescue outcomes for example) or depend on the fitment of ADS-B IN in all or most aircraft (collision accidents) but the costs do not include the fitment of ADS-B IN.

If the benefits of the extended mandate are limited to those resulting from this extended mandate and the costs include both ADS-B OUT and ADS-B IN this extended mandate is not justified by the figures presented.

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