



International Civil Aviation Organization

**Automatic Dependent Surveillance – Broadcast (ADS-B)
Study and Implementation Task Force**

Brisbane, Australia, 24-26 March 2003

Agenda Item 3: Evaluate information available on the selection of link technology as the preferred technology for Asia/Pacific Region.

GENERAL AVIATION AVIONICS

SUMMARY

This paper discusses the availability of low cost ADS-B avionics suitable for general aviation.

(Presented by Australia)

1. Introduction

1.1 It is clearly desirable for ADS-B avionics used by international and domestic air transport category aircraft to be interoperable with the ADS-B avionics used by general aviation in the same airspace.

1.2 Some studies have indicated that the cost of ADS-B avionics for 1090Mhz avionics is marginally higher than other technologies when avionics of certain “equivalent” baselines are compared. However if a very low capability baseline is chosen, the result is likely to be different. If “ADS-B out” is considered alone, then General aviation avionics can be quite inexpensive and possibly less expensive than alternatives.

1.3 The use of 1090Mhz Mode S ADS-B in general aviation means that a single avionics equipment can perform both the transponder and the ADS-B functions using the same RF components, antenna and antenna cabling. Aircraft which already have a transponder have a number of choices including :

- a) Upgrade by replacing the existing transponder with an ADS-B capable transponder and reusing the existing antenna or
- b) Keep the existing transponder and install a new avionics equipment which transmits ADS-B messages only or
- c) Upgrade by installing a combined transponder, mode S receiver and associated cockpit display of traffic.

2. Available avionics for GA

2.1 The Honeywell KT73 mode S transponder is available for GA class aircraft. This transponder has been TSOed against the FAA’s C112 requirement for mode S transponders. This fully capable Mode S transponder can also receive TIS and can broadcast ADS-B. The announced list price by Honeywell is \$5,460 USD

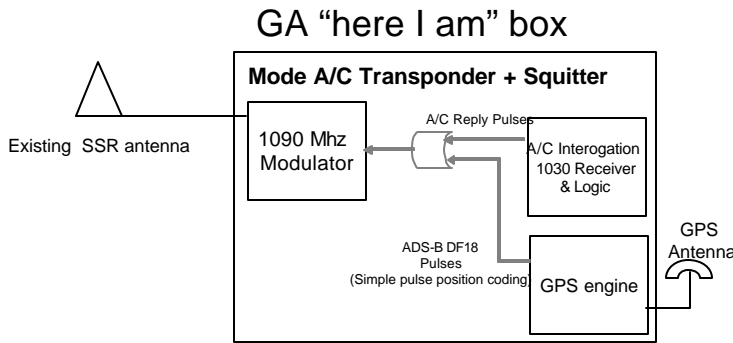
(see <http://www.bendixking.com/static/catalog/viewproductdetails.jsp?pid=136>)

2.2 A number of niche avionics manufacturers are making low cost Mode S transponder which they claim will be ADS-B capable. These niche companies are targeting gliders and ultralight aircraft market which requires low cost, low weight and low power requirements. Further details can be found in WP18.

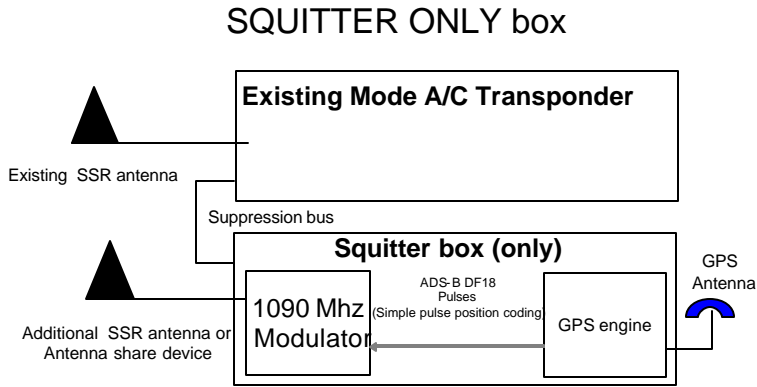
3. Squitter only avionics

3.1 Airservices Australia is examining the possibility with a number of vendors, of production of

- a) a mode S squitter box. This box would simply broadcast the ADS-B DF18 message and would not include all the capability to operate as a mode S transponder. Both production and certification costs could be expected to be very low as a result.



- b) A mode C transponder that can, in addition squitter ADS-B DF18 messages supporting ADS B out.



3.2 Mode S based DF18 messages are simple pulse position modulation of a 1090Mhz carrier. (see diagram above). Whilst no commercial product is yet available, it is expected that such units can be produced for less than \$5,000 USD including the GPS engine.

4. Recommendation

4.1 The meeting is invited to note that low cost ADS-B avionics may be available using mode S extended squitter – but not necessarily including full mode S transponder capabilities.

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