

ABC Submission on the Draft Digital Radio Channel Plans and Draft Frequency Allotment Plan Variation

October 2007

Introduction

The ABC welcomes the opportunity to comment on the Draft Digital Radio Channel Plans (DRCPs) and Draft Frequency Allotment Plan Variations released by the Australian Communications and Media Authority (ACMA).

As a member of Digital Radio Broadcasting Australia, the ABC has been working closely with SBS and the members of Commercial Radio Australia in developing joint positions on many aspects of the planning and roll-out of digital radio in Australia. Engineering staff from all three organisations have also been in briefings and discussions with technical planning staff from the ACMA.

While the ACMA has invited submissions on three key issues of:

- a) minimum signal levels necessary to achieve adequate coverage
- b) methods to constrain the overspill of signal into adjoining licence area; and
- c) the optional radiation patterns presented in the accompanying engineering report;

the ABC would also like to comment on some threshold assumptions stated in the Discussion Paper released by the ACMA.

The ABC shares industry-wide concern that the present plans and technical specifications make the successful launch of Digital Radio difficult because of the substantial differences in coverage of the initial Digital Radio services with current analog radio broadcast services in the metropolitan areas. This will be difficult to market to the potential digital audience and confusing for the audience who will not understand the reason for the differences.

The ABC acknowledges that there are merits in sharing antenna and infrastructure for digital radio transmission services across the industry, and the potential benefits to both the audience and broadcasters where the signal strength of all services destined for a particular locality are equal.

Staged Approach to Planning

The ABC supports the roll-out of digital radio services in the capital cities in a series of stages due to the uncertainty regarding long term spectrum arrangements as identified by the ACMA. The lack of available suitable Band III VHF frequencies have led to planning of the transmission parameters for only the main or primary digital radio transmission site in each metropolitan radio area in the first instance. However, the ABC shares industry concerns about the lack of planning for any infill transmitters. Several key sites have been identified by the industry as being needed at launch to address coverage issues within the primary coverage of the main transmitters (for example surrounding the Sydney CBD). The ABC encourages ACMA to find a way to

accommodate these transmitters immediately to allow a more successful launch of the service to the public.

Number of Services Available with AAC+

There is an element of confusion in the Discussion Paper as to the number of services that can be delivered within a single T-DAB transmission. On page 6 of the Discussion Paper, it is claimed that with the incorporation of more efficient audio coding techniques known as Advanced Audio Coding (AAC) and Advanced Audio Coding (AAC+), that the number of audio program streams that can be carried for the same audio quality level is around three times greater than the nine stereo audio program streams at approximately the same audio quality as current FM radio that could be supported by the original T-DAB technology. Elsewhere, on page 13, it is suggested that the "ABC and SBS could jointly provide 16 'near CD' quality (64 kbit/s AAC) services or 21 'better than FM' quality (48kbit/s AAC) services.

AAC+ demands a higher allocation of the bitstream than with the original T-DAB technology for Forward Error Correction to ensure a robust signal. FEC level 3A was used in the field trials for AAC+ by the WorldDMB Technical Committee and has been determined as the minimum that should be used. Half of the bitstream is therefore taken by the primary error checking and correction system. There is also a secondary error correction using the Reed-Solomon coding that the ABC is assuming can be done after the FEC coding. As a result, with a protection level of 3-A, the net audio bitrate per multiplex is 1.056 Mbps. This yields a potential number of services similar to those mentioned in page 13 of the discussion paper and not the larger number shown on page 6 of the paper

Planning for National and Community Broadcasters

The introduction of digital radio multiplex transmitter (DRMT) licences brings in a new dimension for T-DAB planning. The ABC notes that the definition of DRMT licence states that it is for use for transmitting specified services 'in a designated BSA radio area' which effectively equates to a commercial licence area. Consequently planning of national digital radio services will be on an identical basis as planning for commercial and community digital radio broadcasting services.

Historically national analogue broadcasting services are not constrained to licence area. Having regard to interference, the design of ABC's analog services has always been optimised to provide a wide coverage where practicable. This results in a higher effective radiated power (except Sydney) and in most cases omnidirectional radiation pattern to further extend its reach to the audience.

The ABC acknowledges the technical challenges of planning for national digital radio services and notes that the definition of a category 3 DRMT licence states that it is for use for transmitting specified services 'in a designated Broadcast Services Act (BSA) radio area'. The limitations in coverage areas of VHF Band III services in comparison with the existing

coverage areas for the ABC's high powered FM services will result in additional transmitters being required by the ABC for digital radio.

For example, under the proposed planning regime for national digital radio services, separate high-powered national digital radio services will be required for the regional commercial radio licence areas close to metropolitan centres including Geelong in Victoria, Ipswich in Queensland, Murray Bridge in South Australia, Mandurah in Western Australia, and Campbelltown, Katoomba and Gosford in New South Wales. In an analog world, the ABC serviced these communities, apart from an occasional low-powered in-fill translator, from the main high powered FM and AM metropolitan services. The ABC notes that this is an additional cost impost ultimately for the Government. However, the benefits of infrastructure sharing, service planning and to the audience, of using common building blocks may outweigh the cost penalty in the long run, but this conclusion needs further detailed analysis that is not possible within the context of the current DRCP.

Considerable additional work is required to identify the final number of high powered national digital radio services and cost to Government that would be required to deliver equivalent coverage to existing ABC audiences using metropolitan and regional commercial digital radio transmission parameters.

T-DAB Introductory Framework

The ABC is seeking the ACMA's advice on the framework of the DRCP process. The ABC is concerned about the detailed process and whether it will be similar to the DCP process and whether an Implementation Plan will be required to roll out each T-DAB service. This matter must be resolved urgently because such approvals will fall on the critical path of contracting transmission services to achieve the required January 2009 commencement dates.

The lack of certainty about final specifications is also a matter that will impact on costs and implementation decisions. For instance, if the ABC were to know the final power levels and anticipated dates they might be permitted, then the transmission contracts could consider the economic consequences of incorporating sufficient headroom into the initial specifications of equipment. In the absence of such information, there may well be the need for a complete system upgrade or replacement once the final specifications are known. This is particularly of concern in relation to antenna pattern difference between the initial and final services.

Whilst ABC appreciates the DRCPs have been prepared in an environment of tight time-frames and uncertainty regarding long-term spectrum arrangements, the ABC is of the view that it is important for ACMA to establish the technical planning guidelines for digital radio at the onset of the planning stage, similar to the one developed for planning DTTB services. An indicative time-frame should also be given for ACMA to address the need for, and transmission parameters of repeaters that may be required to either in-fill coverage deficiencies or extend coverage.

An interference management scheme should also be considered and in place to effectively manage any interference issues arising from the commencement of T-DAB services.

Minimum signal level considerations

The ABC shares the concerns of the broader radio industry in terms of the definition of minimal signal levels.

For digital radio to be a success in Australia, it needs to be able to be received throughout a given radio market with the variety of receivers that Australians have long used to listen to radio. Radio is a mobile and a personal portable media, as well as a high fidelity fixed media. As a consequence, digital radio needs to be able to be received in a consistent fashion by hand-held "pocket" radios as well as mobile receivers in automobiles and benchtop or "kitchen" radios. Listeners using "pocket radios", of which there are a range of models already widely sold in Europe using the traditional T-DAB technology, expect their radio reception to continue as they move in and out of buildings, especially domestic dwellings.

The less than optimal reception that is being currently planned will limit the success of digital radio for listeners who adopt the new technology.

Power levels

The ABC believes that the ERP can be higher than that proposed in the DRCP and that there needs to be some reconsideration of the antenna patterns to accommodate the practical antenna design possibilities and at the same time provide a service to the audience that will promote rather than hinder consumer acceptance of digital radio. The ABC has been party to and supports the detailed technical work undertaken by CRA in the context of Digital Radio Broadcasting Australia to identify potential adjustments to the current planning.

It is noted that an ERP of 12.5 kW has been proposed for all T-DAB services in the six state capital cities. The ABC has concerns on the low ERP proposed in the DRCP. Even with the use of the worse protection ratio (15.4 dB for frequency block 9A), the ERP calculated should be 14.5 kW.

The ABC also believes that it is important that the final ERP for these services following the closure of analogue television be included in DRCP.

In addition, as Channel 12 has been assigned for T-DAB services in Hobart, this provides a better protection ratio compared to channel 9A as the interference is to a DVB-T service. As a result, the ERP can be higher than 12.5 kW as proposed by ACMA.

More importantly the ABC is of the view that the protection ratio requirement needs to be further canvassed and agreed to by key stakeholders at the onset of the planning process. Using protection ratio figures from current standards without qualification would not be acceptable and is likely to compromise on T-DAB coverage.

Constraining the overspill of signal into adjoining licence area

The ABC believes that planning to remove the possibility of overspill of signal into an adjoining licence area will result in additional technical restrictions on the main services. At the fringes of the reception area, it is already clear that there will be limited in-building reception and other factors that will reduce the reliability of universal reception of the digital radio services. Fortuitous reception of the overspill signal has not been and continues to not be of concern to the ABC.

The ABC is of the view that overspill of signal into adjacent licence area is more an issue of potentially devaluing broadcasting services in terms of revenue derived from advertising within specific commercial markets. As such ABC should not be bound by the signal overspill requirement with a view to not compromising its intended coverage.

Optional radiation patterns presented in the Engineering Report

In some instances, the planning and delivery of a radiation pattern to alleviate co-channel and adjacent channel interference into particularly low-powered television translator services is potentially much more difficult than replanning and moving the television service. For example, the ACMA should look at the consequential reassigning of the SBS Lileah digital television translator service to the UHF band as this would remove the need to incorporate a significant and difficult to implement notches into the patterns for both the Hobart and Melbourne digital radio services.

Interference Issues

The ABC has concerns on digital radio channel assignment which has interference issues with existing or proposed Digital Terrestrial Television Broadcasting (DTTB) services. The ABC is of the view that where possible, ACMA should avoid channel allocation which result in ERP restrictions due to interference to DTTB services, which replace their analog counterpart after the analog switch-off.

In the event where interference is caused to a Band III ABC DTTB service, the ABC may consider moving that service to its analog channel on the same band after the analog switch-off. The ABC would request ACMA to reserve that vacated analog channel so that its T-DAB coverage is not compromised in the long term. An example would be at Wide Bay in Queensland where ABC may consider moving its DTTB service from channel 9A to channel 6 after the analog switch-off.

Nominal Sites

The ABC is in the process of assessing the Request for Purchase for transmission services and other aspects of the initial rollout of T-DAB for the national broadcasters and as such, all sites proposed in the DRCP document can only be considered as nominal locations.