Broadcast Australia

Response to Department Of Communications Digital Radio Discussion Paper

28 February 2014

Introduction

Broadcast Australia (BA) welcomes the opportunity to contribute to determining the future of digital radio in Australia. With many decades of experience in the delivery of national broadcaster services, including more recently digital radio, BA has a strong heritage and interest in the ongoing strength and success of the terrestrial radio platform.

It was an interesting coincidence that, during the discussion paper response period, that the UNESCO World Radio Day was celebrated, which aims to promote the value of radio across the global community, especially for those that are disadvantaged. In this regard, it is important to understand the advantages and disadvantages of the terrestrially broadcast digital radio platform relative to alternatives:

- All alternative platforms today require ongoing subscriptions, either through the provision of services themselves or through subscriptions to access them.
- Users, Government and the industry as a whole have invested very substantial sums in terrestrial delivery platform and reception devices (analogue and digital).
- No other platform offers the certainty of wide standardisation in terms of ongoing devices and platform longevity.
- No other platform can offer as economical a solution for ubiquitous delivery to all Australians, wherever they are located. The cost of providing equivalent streamed content, coverage and availability is likely to prove prohibitive for at least the foreseeable future.
- No other platform is as effectively regulated to ensure the content and quality meets the expectations of modern Australian society on a long term basis.
- No other platform is as resilient in times of natural or man-made disaster providing important information long after the mobile and fixed line Telco networks may have ceased to function.

BA submits that only a terrestrially radiated broadcast regional digital radio platform can meet the requirements of providing guaranteed access to a wide range of higher quality radio services to all Australians, regardless of their location on a capital city or a regional area. Critically, the terrestrial platform allows this to be done at low initial cost relative to alternatives and at no ongoing cost to the consumer.

In this submission, BA responds to many of the questions posed in the Government's Discussion Paper, with a focus on the technological, market and public policy issues concerning the future of digital radio in Australia. (Questions from the Discussion Paper where BA has no contribution to make have not been included).

Executive Summary

By 2013, 1.3 million digital radio devices had been sold across Australia enabling listeners to pick up the 209 'DAB+' services that currently reach 64% of the population[1]. It is now important that the next steps are made to help bring the consumer benefits of digital radio to regional and remote Australia, and avoid the prolongation of a divide that means listeners in these areas are 'missing out' vis a vis their capital city counterparts.

As an immediate and concrete step, BA believes that this means preparing a channel plan to ensure the Government and industry as a whole understands the relevant spectrum options and trade-offs to facilitate the future geographic expansion of digital radio.

BA believes that it is entirely appropriate that the existing DAB+ solution used in Australia's metropolitan cities also be used for regional digital radio, using the existing legislated VHF spectrum. That is likely to create some regulatory and commercial issues due to limited spectrum availability, but these should be resolvable based on the following general approach:

- Plan for a National broadcaster DAB+ multiplex which provides state or national based content, operating as a Single Frequency Network (a 'Category 3' Licence under the legislation) within each state.
- Plan for a second multiplex to carry the local content from the National Broadcasters combined with the local Commercial and Community services (a 'Category 2' Licence)
- Consider what spectrum planning and technical parameters should be put in place to ensure cost effective delivery of the maximum amount of content possible over the widest geographic area.

The translation of this general approach into a robust implementation methodology means that the next vital step is for the Government to authorise the commencement of a detailed channel planning process. This can be done partly in isolation of both technology and exact frequency band and will enable a potential rollout of regional digital radio to be quantified, and provide it a broad framework within which to operate. BA recommends that this commence in 2014 and be completed during 2015 in consultation with all industry players, in order to help the Government understand key challenges and opportunities and make informed decisions about a potential staged implementation.

It is recommended that the Department or the ACMA create a secretariat to facilitate industry participants developing the channel plan themselves. The Australian broadcasting industry has demonstrated through the Digital Television restack channel planning process that it has the capability to conduct a process of this sort in a highly effective and time/cost-efficient manner.

The output from the channel plan can be used to develop a staged implementation plan, which both manages the cost of rollout and provides appropriately increasing regional coverage. A potential plan is below:

1. Today: Existing metro facilities, providing approximately 64% population coverage
2. Year 1: 11 remaining metropolitan and 1st tier regional cities, providing 80% population coverage
3. Years 2, 3 and 4: 26 further regional centres extending coverage to 87%, 92% and 94% population coverage with each respective stage.

[1] WorldDMB Update, at http://www.worlddab.org/public_document/file/387/WorldDMB-Global_Update-Sept_2013_-LoRes.pdf?1379926526

Part 1: The regulatory framework

Questions:

1. **Is the licensing and planning framework for digital radio operating effectively? Should any changes be made to the regulatory framework?**

   The digital radio framework is operating successfully in most respects, but there are some areas where change will be required particularly if there is to be a like-for-like replication of all of the content currently available on analogue radio. As detailed in the response to questions on spectrum (below), the limited spectrum available for regional digital radio services is likely to create constraints on the number of geographic areas. There is a range of ways this could be managed, for instance:

   - The spectrum available could be expanded beyond the current 14 MHz using the unused terrestrial broadcast spectrum (sometimes called the 6th Channel); or
   - An initial first wave of terrestrially radiated digital regional radio could be rolled out that does not replicate all the content available in analogue today, with the remainder of the content being made available at a later date.

   If the Government decided to adhere to the current 14 MHz block allocated for digital radio, then licensing/planning changes may be required in order to enable national broadcasters to provide the widest area of coverage. Currently, the national broadcasters are compelled under their metropolitan DAB licences to operate with radiation patterns limited by overspill restrictions into adjacent commercial markets). This can be overcome either by aggregating commercial license areas, to allow radiation patterns to have fewer restrictions, or to allow national broadcasters to have different radiation patterns. The former approach is likely to be preferable as national broadcasters will most likely have to share a multiplex with commercial services for local services as outlined in our response to spectrum questions, and having different radiation patterns creates service access equity issues. Obviously a change of this type would require consultation with commercial radio operators.

2. **Should the provisions concerning the commencement of digital radio services be modified or removed, allowing broadcasters to commence services whenever they wish (subject to spectrum planning considerations**)?

   BA agrees that there are advantages in allowing services to commence at different times. This may allow, for example, national broadcaster services to commence rapidly, helping to 'seed' each market before commercial services then choose to start. If national broadcaster services also serve to seed the start of BA's proposed second, local, category 2 licensed multiplex in an area, this will potentially allow community services to gain access earlier than may otherwise be the case.

Part 3: The Technological Environment and Audience Profile

Questions:

10. What is your assessment of the trends in digital terrestrial radio technology? Does the overseas experience with these technologies have anything to teach us about their merits and appropriateness in the Australian environment?

DAB technology is expanding globally. For example, in the UK the BBC has committed to build-out its national networks to 97% from the current 94.5% for national BBC stations. At least five new local multiplexes will be launched by the BBC in 2014.

The WorldDMB Global Update also gives a comprehensive overview of the current state of the DAB+ and related technologies, and can be found at http://www.worlddab.org/public_document/file/387/WorldDMB-Global_Update-Sept_2013_-LoRes.pdf?1379926526. This Global Update includes analysis of the Australian market, as well as other markets that have implemented DAB. It indicates that as at 2013, around 1.3 million digital radio devices had been sold across Australia enabling listeners to pick up the 209 DAB+ services that reach 64% of the population.

It is worth noting that radio is a dynamic and well used medium in Australia. The number of radio listeners in Australia has been growing (2% over the last two years based on Roy Morgan research[2]) and advertising on radio is forecast to increase at an annual real growth rate of 1.8% to 2017 (PwC Outlook 2013-2017).

Whilst DRM, DRM+, and IBOC solutions are potential alternatives, offering wider coverage and smaller, more locally managed multiplexes, they are unlikely to ever be as cost effective as a more highly multiplexed technology such as DAB+ as much more infrastructure is required to deliver the same number of services. For example, if DRM+ was implemented in VHF band I, designed to offer the same audio quality and number of services as a DAB+ multiplex, it would require 7-10 transmitters and transmitter combining equipment compared with one transmitter and transmitter filter for the DAB+ multiplex. This requirement arises because the multiplex bandwidth is typically 100kHz for DRM+ compared with 1.5 MHz for DAB+, and the capacity is typically 150kbps maximum for DRM+ compared with 1152kbps for DAB+ within those bandwidths.

As such, BA concludes that the most cost effective solution is to adopt DAB+ in the VHF band for the vast majority of a regional rollout. Potential alternatives could be examined in the future if even wider coverage is required.

11. What are your views about the impacts of smartphone and other streamed audio services on the future of 'traditional' radio listening? What data do you have to support these views?

Streamed audio services are growing fast domestically and overseas and BA submits that these can be seen as complementary over the foreseeable future to the 'primary' ubiquitous services that are provided through Australia's terrestrially radiated platform.

Importantly, streamed audio services cannot offer the benefits of low cost ubiquity of terrestrial radio. According to the latest OECD research, Australia has the highest mobile broadband penetration rate in the world at over 100%. However, this figure masks the fact that certain portions of the population are unable to access streamed services. These people are often the elderly and/or lower socio-economic groups in regional areas. They cannot access them either because streamed services require ongoing subscriptions, through the provision of the content services themselves or through subscriptions to access them. Alternatively they cannot access them because mobile coverage is not ubiquitous and they therefore depend on the additional coverage of terrestrially delivered radio.

[2] **Average number of people who have listened to a radio station in metropolitan markets (SYD/MEL/BRI/ADE/PER)**

From a cost efficiency perspective, it is also important to recognise that the audience, Government and the industry as a whole has invested significantly in the terrestrial delivery platform and reception devices, reducing the cost and complexities of expanding to regional areas in DAB+.

While it is true that cars can be fitted retrospectively with the ability to amplify a streamed service from a mobile phone, this is costly and unlikely to prove to be a compelling consumer proposition in the foreseeable future.

BA's understanding is that streamed services are currently nascent and lack the certainty of worldwide standardisation in terms of ongoing devices and platform longevity. Streamed services also lack the same regulatory controls that cover terrestrial broadcasters to guarantee content and quality and therefore should not be considered a true alternative to the terrestrial platform as a 'primary' service to the Australian community. Finally, they rely on the mobile or fixed line networks which lack the resilience of the broadcast networks especially in times of man made or natural disaster. The broadcast radio receivers are also likely to have the ability to function on battery power longer than current cellular handset technology.

In relation to the cost equation, a 2013 study by Teracom[3] calculated that for Sweden the cost of broadcasting linear radio via a cellular network would be Euro860 million per annum Vs Euro10-20 million for the current terrestrial network (excluding one-off capital costs). A variety of reasons account for this huge cost difference, not least the massive amount of capacity that is required to broadcast twenty five channels. This cost estimate applied to both unicast and multicast (LTE/eMBMS) delivery methods. This research also indicates a high degree of unwillingness by consumers to pay for radio services that they receive for free today.

BA has undertaken some desk-based analysis on the Australian market place to explore some of the cost-related issues contained in the Teracom study. To permit guaranteed simultaneous unicast listening to the current peak drive time demand would require a potentially uneconomic density of mobile base stations. Based on 4G mobile technology, BA estimates that individual cell sizes would have to be kept to approximately 375 persons to guarantee a user could get sufficient capacity for radio at the edge of a cell, and with 40% of the overall cell resources consumed by unicast radio.

Similarly, using a multicast telco technology to deliver radio services within each cell is estimated to consume up to 15% of cell resources to duplicate typical DAB+ multiplex capacity. If a true "broadcast" 4G technology was used such as LTE-Broadcast, then using the broadcast-like multicast SFN allocation across a network would reduce cell resource consumption to around 5% to replicate the capacity of a single DAB+ multiplex. This RF resource estimate, extended to consider the comparative cost to invest to build and operate cellular networks compared with DAB+, results in the following conclusions:

- A DAB+ network is much more cost effective than a unicast delivery network, with much higher attributed capital expenditure costs for unicast (at least twice as much), and attributed operational expenditure (i.e. ongoing running costs) for unicast at least seven times higher for the transmission network alone. This estimate does not include the cost comparison for core network and distribution which will again highly favour the broadcast DAB+ network.

- A DAB+ network is more cost effective than a multicast network, and a better investment, with attributed operational expenditure costs for multicast at least 2.5 times higher for the transmission network alone.

- A DAB+ network is as cost effective as a LTE-Broadcast network, and has a major advantage: the LTE-Broadcast network would still be tied to a specific network operator and SIM. Allowing access to all potential users would be problematic, either requiring widespread use of dual SIM phones, or requiring all networks to offer the LTE-broadcast radio services.

[3] Can the Cellular networks cope with linear radio broadcasting?, available free of charge from Lotta Darlin at Teracom, lotta.darlin@teracom.se

12. Given its importance in the radio listening environment, what digital radio technologies are likely to be adopted by car manufacturers in the short to medium term?

As per the WorldDMB Global Update, there is already significant adoption of DAB+ by vehicle manufacturers in many markets, including Australia, as the standard is very widely adopted. It is the only digital radio standard likely to be adopted by vehicle manufacturers outside of the USA.

13. What impact, if any, will the intent of several car manufacturers to install internet-connected entertainment systems have on the future of digital radio?

Car manufacturers have started to offer integration of specific streaming service clients in recent in-car media consoles, and projections are for increased penetration over the next 20 years. It is important to note that these are generally software clients embedded in media consoles, accessing the internet via a Bluetooth connection to a bring-your-own smartphone. BA does not believe that streamed services to cars are likely to be able to be a mass market solution in the foreseeable future.

It is also important to recognise that one of the advantages of a broadcast service in a car environment is the reduced need for active interaction with the media console, compared with other platforms. Consequently, a broadcast radio solution is likely to be a safer one.

15. Given its ability to cover large geographic areas, do you think satellite radio may have a future in Australia?

BA responded on this issue in the response to the ACMA discussion paper on Technologies for Digital Radio in Regional Australia in 2010, and our reviewed position has not changed:

- It is unlikely that the satellite services would be offered on a free to air basis, which is unlikely to be acceptable to regional consumers.
- The economics of providing sufficiently local content for consumers is questionable.
- Some areas would still not be able to receive satellite signals, which would give rise to the requirement for a terrestrial in-fill network in order to provide sufficiently wide coverage. Overseas satellite broadcasting solutions aimed at mobile environments such as XM in the USA, the S-DMB service in South Korea have needed to provide terrestrial in-fill supplementation.
- Proprietary receivers would likely be required and this would fragment Australia's relatively small consumer market.

Part 4: Spectrum and licensing

Questions:

18. Are there alternative allocations of spectrum the Government could be considering for terrestrially based digital radio?

BA submits that the VHF band III spectrum already allocated for digital radio is the most appropriate solution. It offers good coverage, and is able to be used by a wide range of existing digital radio technologies and consumer devices already in the market for those technologies.

VHF band I could potentially be used, and is now largely vacant after analogue television switch over, but is currently not used in a 'real' market environment by a digital broadcasting system suitable for digital radio. Consequently, infrastructure and consumer device costs are likely to be higher, and with less choice available, resulting in a more expensive and delayed rollout in band I compared with DAB+ in band III.

Given the same RF channel bandwidths and similar propagation between band I and band III, a channel plan could be developed which would suit the use of two 7 MHz RF channels in either band successfully, regardless of the exact occupied multiplex bandwidth or technology, using a block approach similar to that adopted in the "restack" planning of the UHF broadcasting spectrum.

Despite the appropriateness of the VHF band III allocation, the limited number of RF channels allocated is likely to create spectrum shortage issues in some markets, especially in areas where there are a relatively large number of commercial radio licensees and those adjacent to the existing metropolitan DAB+ allocations. Typical examples are the Gold Coast/NSW border area in Queensland, and the major Victorian regional markets ringing Melbourne. BA has conducted limited channel planning exercises in these regions to examine some of the impacts of the frequency constraints.

To minimise the number of frequency blocks required, BA would propose to have a National broadcaster DAB+ multiplex which provides state based content operate as a Single Frequency Network (a Category 3 Licence) and have a second multiplex to carry the local content from the National, Commercial and Community Broadcasters (a Category 2 Licence). This is likely to involve some compromises in terms of geographic extent compared with the number of services available.

19. What has been your experience of the establishment and operation of a digital radio multiplex? Are there alternative arrangements for sharing multiplexes which would be more efficient, particularly in regional areas, where there are generally fewer services than in metropolitan areas?

As discussed in our response to question 10, technologies that are designed to support smaller multiplexes such as DRM, DRM+ and IBOC solutions do allow simpler mechanisms to localise content, and can permit a one-to-one broadcaster to infrastructure relationship if that is desirable. However, a larger multiplex can still offer similarly localised content, and is far more cost effective on a service by service basis, as there is a higher degree of common infrastructure. For example, the cost to provide and operate infrastructure for a 20 service DAB+ multiplex is only slightly more expensive than that for a 2 service DRM+ multiplex.

20. Is the current regulatory and technical framework for digital radio best suited to providing digital radio in regional and remote Australia? What mix of features (for example, range of services, signal/population coverage) are desirable?

The framework should be sufficient to allow for the regional digital radio rollout to:

- Eventually match the coverage and population of the existing national AM and FM networks
- Provide sufficient services for equity of National broadcaster services in each area
- Provide sufficient services for commercial and community services as demanded