



**Submission and comments to the Australian Government:
Department of Communications, Information Technology and
the Arts. (20th April 2005)**

Based on:
**Introduction of Digital Radio
Issues Paper
December 2004**

Introduction

WorldAudio Limited has been invited to make a submission on policy issues associated with the introduction of digital radio broadcasting in Australia as part of an industry-wide government consultation process conducted by the Department of Communications Information Technology & the Arts.

WorldAudio Limited is a publicly listed Australian owned company; stock code WAG. WorldAudio is the operator of Radio 2 Pty Limited a 100% owned subsidiary.

The Radio 2 Network includes up to 50 AM band transmission sites with coverage areas in all states and territories in Australia. Radio 2 also delivers programming through the digital platforms on the Foxtel and Austar TV subscription services. Additionally, Radio 2 has recently commenced programme streaming through its internet site www.radio2.com.au.

Radio 2 has been at the forefront of the development of digital radio services in Australia right from the beginning. The broadcaster is a founding member of and plays an integral role in the Melbourne based research consortium, conducting DRB trials with a large consumer panel under the supervision of the respected research group Millward Brown.

The consortium has also conducted significant laboratory based 'listening' research into compression technology comparing a range of codecs and bit rates in co-operation with the R&D department of the ABC in Sydney.

Five year moratorium

Federal Communications Minister, Senator Helen Coonan, has stated publicly that there will be a five year moratorium on all new Licence Area Planned commercial digital radio licences. That means only incumbent commercial broadcasters will be granted digital access and will not have to face new competition for a period of 5 years from the “resolution of technology and spectrum issues and the determination of a timetable for the rollout of digital services”.

WorldAudio – Radio 2 is an incumbent commercial broadcaster. The Company holds a Section 40 commercial radio content licence issued by the Australian Broadcasting Authority (ABA), allowing it to broadcast a commercial radio service Australia-wide. WorldAudio – Radio 2 also owns apparatus licences on AM frequencies 1611, 1620 and 1629 issued by the Australian Communications Authority (ACA) which may be used to provide a commercial radio broadcast service.

The Company provides a commercial broadcast service through its Radio 2 AM network via up to 50 transmission sites in every state and territory capital city and most major regional centres.

No other existing commercial radio network can boast such widespread analogue broadcast coverage, nor such a widespread coverage of new digital radio broadcast services when implemented.

WorldAudio - Radio 2 is an incumbent commercial radio broadcaster.

There is no difference in the type of commercial broadcast content allowed under a Broadcast Services Band (BSB) licence and a Section 40 commercial licence used on the non-Broadcast Service Band (non-BSB). Listeners select their preferred broadcasters from the same receivers. There are no markings or barriers that identify passing from an AM BSB frequency range to another AM non-BSB frequency.

The commercial program content currently heard on Radio 2 is a unique mix of news, sport, personalities, entertainment and music with a target group in the adult 35-59 demographic.

The sport includes live coverage of AFL, Soccer (international and Australian), the NBL and WNBL, and expert commentary on a wide range of popular sports. There is a close association with Fox Sport presenters who co-host programmes.

National personalities include the popular Mikey Robbins, Ian Rogerson, Nick Bennett, and Colin Turner. News coverage is provided in a unique venture with Sky News Channel, and includes half hour programs at the beginning of the day at 6.30am and at 6.00pm. Regular hourly bulletins provide updates throughout the day. Radio 2 has also signed well known presenter Ross Symonds to anchor a Sunday morning Business program.

WorldAudio – Radio 2: A driving force in digital radio broadcasting

WorldAudio Limited has invested over \$20 million in national transmission and support infrastructure to prepare for the arrival of digital radio in Australia. Its purpose-built digital broadcast centre at Sydney Olympic Park, Homebush is designed specifically for digital radio. The Company has a legitimate presence in the existing analogue commercial radio market; pays licence fees to the Australian Broadcasting Authority (ABA) and Australian Communications Authority (ACA) and must obey content rules set out in the Broadcast Services Act in line with any other incumbent commercial broadcaster.

WorldAudio – Radio 2 is involved in Australia's first VHF Band III terrestrial digital radio trial in Melbourne, in conjunction with Broadcast Australia, ABC, SBS, Sport927 and Community broadcasters.

Recent listener research at the ABC research and development studios at Ultimo, Sydney conducted by the Melbourne DRB consortium demonstrates that by using the latest digital compression codec technology, every existing commercial and community radio station, plus the ABC and SBS, will be able to deliver full digital radio services (CD-quality audio plus data) in every radio market in Australia, including Sydney and Melbourne within existing spectrum availabilities.

In fact, this research demonstrates that there would be adequate space on the digital spectrum for all incumbent broadcasters plus a number of future new entrants based on a recommended bit rate allocation of between 96kbps and 128kbps for digital content providers (broadcasters).

The WorldAudio – Radio 2 presence across metropolitan and regional Australia will drive the take up of digital radio. This will be particularly so in many rural areas, where but for the presence of WorldAudio there would be little or no competition in the commercial radio market and thus no motivation for incumbent broadcasters to migrate to digital broadcast spectrum.

WorldAudio – Radio 2 argues that without its presence in the digital radio landscape there could be a repeat of the digital TV experience, where free-to-air incumbents secured a closed shop to new entrants. This approach has fallen a long way short of what was hoped and has resulted in a lack of competition necessary to drive consumer take up of the new technology.

WorldAudio – Radio 2 will drive the introduction of digital radio in Australia. The Company will deliver greater choice, diversity and benefit to listeners.

COMMENTARY ON MATTERS RAISED IN THE ISSUES PAPER

Commentary on the Study Group's conclusions that Eureka 147 would appear to be the appropriate platform for Australia to adopt for terrestrial digital services.

The DRB trials being conducted in Melbourne in which WorldAudio – Radio 2 is participating is utilizing the Eureka 147 platform and broadcasting on VHF Band III. Eureka is the most mature terrestrial digital radio technology currently available. It is generally considered a robust system.

Insofar as the delivery platform is transparent to the general population, the Melbourne DRB trial has been measuring panel perceptions of the reception quality of audio services.

Quality perceptions of analogue radio have decreased amongst panellists exposed to 'the digital radio experience', from 59% rating analogue quality as Excellent/Very Good, to 45% in the post-trial period.

The post trial figure for **digital quality** of reception was 71%.

- a) Other points of difference covered "more information for listeners.." As a digital service benefit, this figure went from 19% to 31% through the trial period.
- b) Other benefit factors of "variety/range/choice" went from an aggregate of 14% to 29% during the trial.

The consumer trial is ongoing and has recently been extended by the Australian Broadcasting Authority until May 2006. Results of the consumer trials and associated research conducted by the Melbourne trial consortium will form part of a further report which will be made available to government and its agencies.

Commentary on the appropriate model for the introduction of terrestrial digital radio services in Australia.

Commentary on consideration of digital radio as replacement technology for existing analog radio services, including likely time frame and other relevant factors.

A major factor in consideration of the optimal model for DRB introduction is the fact that consumers will be required to purchase brand new units of new technology. In other words current radio receivers will not be able to receive digital radio broadcasts. There is no 'conversion' such as a set-top box. There is no 'soft' introduction period such as the early appearance of FM receivers in cars and audio units in the 70s prior to the official launch. However models of DRB receivers also incorporate the ability to tune to AM and FM services as well.

The issues paper places a Managed Introduction model between the Full Conversion and Market Based models.

The early introduction of an analogue switch-off date (as in Full Conversion) would not be advisable. International experience has demonstrated the fact that a slow take up of the new service makes it extremely difficult to project levels of set saturation. Attempts to switch off analogue television have met with considerable unrest in the UK.

WorldAudio - Radio 2 is of the opinion that both the consumer and business markets will meet at a point where consumers are comfortable with operators who will switch themselves off AM/FM and migrate exclusively to DRB. It will in other words be a market based decision by the operators. Some radio target groups may be earlier adopters and this will be a major factor influencing the total broadcast market - including non-commercial.

There would not be any current analogue broadcasters who would not benefit in some way from a migration to DRB - enhanced music and voice quality, improved station identification, and the opportunities that additional data forms such as pictures and text would present. It will be up to those individuals however to convince their core target groups that switching is worthwhile. It's quite possible that some stations or networks may incorporate special retail offers into their promotional efforts (i.e. become a direct market source for various DRB receivers).

Australians have been amongst the forefront of new technology adaptation - from microwave ovens to mobile telephony.

We need to fully understand and acknowledge the complexity of the Australian traditional mix of AM/FM City/Country, the range of radios in home and car, availability and permitted use at work - also use of radio stations in public places such as shops and restaurants, buses etc. To this environment we can now add listening at home or work through the internet, the use of television (subscription) for audio, and future listening through mobiles and other portable devices such as PDAs and iPod.

Full conversion could simply result in duplication of existing services with no real inducement for added digital services. Managed conversion should encourage Digital operators to compete with existing analogue and let the market and their listeners decide.

Eventually DRB would become the dominant broadcast platform and would replace current analogue technology as the preferred platform for both broadcasters and consumers alike.

WorldAudio – Radio 2 would favour a type of Managed Introduction approach that enables priority access to digital capacity for incumbent analogue broadcasters on a “voluntary” basis. Those broadcasters that indicate a willingness and have the ability to prioritise a digital platform transition and provide more than just a simulcast of programming currently found on existing analogue platforms should be allocated digital spectrum to develop value-added services such as audio, data, pictures and text for the benefit of consumers.

WorldAudio – Radio 2 would be prepared to provide full service digital radio broadcasts to major metropolitan cities including regional and rural areas of Australia as a priority.

<p>Commentary on issues associated with the availability and performance of spectrum for terrestrial digital radio services. Commentary on issues associated with audio bit rates, audio quality, coding systems and the number of services (and possible constraints on channel availability) that may be made available in Australia.</p>

Spectrum availability and performance issues have been clouded by existing technology that has appeared to default to levels that are higher than are now necessary for providing acceptable levels of broadcast quality.

The issues paper observes that in the current international services, bit rates between 128kbps and 192kbps for music and 64kbps to 128kbps for voice are 'typical'.

There is now compelling evidence that improved encoders provide better quality broadcast listening at lesser bit rates than currently perceived as acceptable minimums.

International research carried out by Digital One (UK, October 2004), entitled "*Subjective Evaluation of Stereo Audio Coders for Digital Radio*" [Dr. Gilbert Soulodre, Camden Labs, Canada] under rigorous methodology tested three stereo audio coders for digital radio over a range of bit rates 112, 128 and 160 kbps and concluded that:

- *"New coders at 112kbps give better or equivalent quality to existing coders at 128kbps."*
- *"New coders at 128kbps give better or equivalent quality to existing coders at 160kbps."*

The results of the study indicate that the new implementations of the Layer II coder offer the possibility to improve subjective performance while reducing bitrate.

The reduction in bitrate would make additional capacity available in the multiplex to accommodate additional services.

Following from these observations, the Melbourne research consortium resolved to undertake similar tests, employing a panel of 'golden ears' - ie people who are professionally experienced in listening to sounds and music.

In March 2005 the consortium tested a panel of 34 expert listeners along strict ITU guidelines (in similar form to the UK Digital One tests), and measured results from three codecs. The panel included members from government departments including the ACA and DCITA.

Two of these codecs were current MPEG-1 Layer II models, and the third, a high efficiency (or HE) AAC.

The research took place at Ultimo, in the ABC's Broadcast and New Media Research & Development Department. The study was supervised by Department Head Spencer Lieng and administered by Michael Bennet and Ian Dash of that department.

A formal preliminary report (more stages are planned) is in preparation; however there were some immediate basic findings which will have major impact on the number of digital radio broadcast services that can be made available.

The results from these tests showed some statistically significant rankings of subjective audio performance of each of the three types of codecs.

There were significant overall differences between MPEG-1 Layer II codecs at rates of 64kbps and 128kbps and the MPEG-4 (AAC+) codec with the latter performing significantly better, even at much lower bit-rates, around 48 kbps.

The ratings showed almost no perceived difference between 64kbps and 128kbps codecs on narrow-band voice which suggests that there is no advantage in using a 128 kbps codec for such voice programme material.

More will come out of this research later, however there are strong indications that even 48kbps through the new AAC+ can achieve a quality level equivalent to 128kbps on the older models.

When requirements for data alongside audio are taken into account, WorldAudio – Radio 2 is of the opinion that good quality (listener perception) full array services could be provided on or from as little as 48kbps audio plus 48kbps data. Even at 96+48 or 96+96 this technology can fit many more current and potential future operators into the available bandwidth of a single Eureka 147 multiplex than was previously thought.

This also indicates that best practice multiplex management could mean that from the above, an operating norm might be only be a base level for each broadcaster, with programmable room for additional space - exactly as the Melbourne test participants have experienced and cooperated on.

In Europe and the U.K. current maximum standards in use for digital broadcasts are around 128kbps. New generation codecs that are currently being deployed will bring the maximum bitrate levels even lower.

Commentary on the introduction of the multiplex operator into the radio value chain including the implications for Australia's broadcasting market and regulatory frameworks and also including comment on the appropriate arrangements for allocation of multiplex licences and associated spectrum.

We understand that Broadcast Australia will be making a significant submission addressing this issue.

However, WorldAudio – Radio 2 is in favour of third party multiplex operators providing a managed digital transmission service.

The U.K. model is currently based on this approach and functions to the benefit of broadcasters utilising the service. The multiplex operator is providing a managed transmission service under strict government guidelines and control. Broadcasters are provided with a 'must carry' spectrum access guarantee for a lengthy period of time (10 to 20 years) a minimum bit rate guarantee, minimum transmission reach parameters and regulatory controls on pricing for the provision of the service.

Commentary on the role of the national broadcasters and the community broadcasting sector in the introduction of digital radio, including arrangements for the implementation of digital services by the non-commercial sector and access to multiplex facilities and (community) licence allocation.

The national broadcasters, ABC & SBS and Community broadcasters will need to play a pivotal role in the uptake of digital radio broadcasting in Australia to develop the success of the technology at a consumer level.

Radio listening patterns can be divided in a large number of ways. One particular measure used is that of 'exclusive listening'. That is, those people who only listen to one or perhaps no more than two stations in their home market. There are exclusive listeners to commercial stations, and there are exclusive listeners to 'the ABC'. Within the range of ABC program offerings there would also be exclusive listeners to particular services (eg ABC Classic FM).

In terms of equal availability of services, it is vital that the ABC play a major role in implementation, alongside the commercial sectors. Cooperation has already been well demonstrated by the now long term association of the Broadcast Australia multiplex, commercial, community ABC and SBS operators in the Melbourne trial. The interest and single objective are the same: that is, a timely introduction of publicly available digital radio services. Competition in an open market for listener shares follows as a given.

It has been a significant finding in the UK that uptake of the new technology has been notable amongst an otherwise unlikely group of classical music / relatively mature people who would otherwise not be counted as 'early adopters'. It seems their search for quality output has motivated an early changeover to digital audio. This has been driven by the BBC which has invested in an array of digital broadcast services with a wide range of content provision.

Commentary on key drivers that are likely to be important in support of take-up of digital radio in Australia including issues associated with the provision of new and niche audio services and innovative data services.

WorldAudio - Radio 2 is currently a key driver in the introduction of digital radio broadcasting. The Company is of the opinion that providing more than just a simulcast program stream, and providing diversity and innovative extra services on the digital platform including enhanced audio, text, graphics and pictures would by offering these "value-added" elements only enhance and encourage faster consumer take-up.

It has become apparent from the Melbourne DRB trials that apart from the perception of high quality audio, there are strong expectations of back-up or complementary data services or features (which become benefits) such as rewind or storage.

These expectations have become stronger as the panel have lived with their digital sets. We are aware that some panellists have taken steps to improve their experience by hooking the basic test receiver up to their computer.

A comment from another panellist in a group discussion also rings significantly: "I like having the information, if you listen to sports paying out dividends (sic). That would be really good. Might even give you horse's names."

Other indications of interest levels

In their 2004 series of omnibus surveys around Australia, the Roy Morgan Research Centre found that nearly two million people had bet with either the TAB, a bookmaker or the internet in the last three months - some 12% of the adult (18+) population.

The same data base picked up a projected 1.7 million people intending to purchase an audio or audio related product in the next 12 months. Another significant group of 1.1 million intend to buy a new car in the next 2 years (duplicates partly with the 'audio' or 'betting' group). The significance of the latter new vehicle group is of course that with the emerging interest of vehicle manufacturers, digital radio in-car will be seen as a major consumer feature/benefit.

In the Melbourne digital trial at the end of phase 1 2005, and during the trial period, **panel intent to purchase floated between 69% and 75% claiming they would probably or definitely purchase a digital radio.**

When 'prompted' with **more information about the added features of digital services, this figure rose to 91%** (and that included a group of panellists who had experienced some technical difficulties at some stage during the previous 6 months).

Essentially, this is text book marketing of a 'new pioneering phase' of a product category previously known as "radio" (receivers and broadcasting). That is, in the formative period, the heaviest emphasis will be on education, to drive early adoption and to convert 'features' into 'benefits'. Broadcasters who focus on news, or current contemporary music, or racing (or sport in general), or classical music and so on right through the whole product mix will be looking to aspects of digital radio broadcasting that best suit their needs. Data transmission of an opera libretto could be as meaningful and beneficial to its fans as much as the lyrics to a track by Silver Chair, to its fans. Or as the respondent above alluded to, maybe we will even see horse's names! All of these points or benefits add up to stimulation to purchase.

Marketing [market/consumer education] should probably be seen therefore as a shared manufacturer, retailer, government, industry and individual or network broadcaster responsibility.

Commentary on regulatory measures - their necessity or appropriateness in matters related to content and services on digital radio, including simulcast requirements, limits on non-audio services or limits on new digital-only services.

WorldAudio believes that this is the ideal opportunity for a complete overhaul of the Broadcast Services Act, in line with now and future convergent media technology attributes.

The Government has already started this process with the upcoming merger of the ABA and ACA into one governing body the Australian Media and Communications Authority [AMCA].

Apart from basic requirements of decency, and accepted levels of correctness as described in the BSA then content providers (broadcasters) should be responsible in relation to the determination and regulation of content and services.

It is currently part of the BSA policy to facilitate diversity and choice in relation to the provision of broadcast services. This policy could be enhanced by allowing for a smooth transition to digital broadcasting and support for broadcasters that have expressed a willingness to develop the digital transition expediently.

As a matter of policy the Government should treat all technologies as neutral in terms of the delivery mechanism to market. That is from a regulatory perspective, the regulation should focus on ensuring maximum diversity and choice rather than trying to control how much non-audio versus audio services are being provided.

Commentary on the potential for data-only service providers to operate on digital radio platforms.

The government has committed to a five year moratorium on the issue of new licence area planned digital radio licences. It is WorldAudio-Radio 2's view that this moratorium could extend to data-only operators as they would be by definition 'new'.

Should incumbent commercial and non-commercial operators be allowed to introduce data-only services? This may be a commercial decision for existing operators, but on the face of it does not seem to make sense or proper use of the full DRB opportunities.

Commentary on other issues or matters relevant to regulation.

Future-proofing of Technology platform

Allocations of spectrum in the near future will be according to contemporary and near future needs and technical abilities. However an appropriate starting point could be to issue 128kbps to existing incumbent commercial broadcasters in line with current accepted maximum bit rate standards operating effectively and without unacceptable broadcast quality degradation in Europe and the U.K. We have already seen in controlled research tests described in this document how developments in compression technology can free up more spectrum space, by allowing reductions in bit rates without damaging perceptions of quality sacrifice.

WorldAudio suggests that a Technology Review Process be set up, that would examine these developments, on say, a 2 or 3 year cycle. This review should be empowered to re-allocate maximum bit rate bandwidth and/or spectrum according to the ability to deliver services at lower bit rates without perceived quality sacrifice.

This measurement process is already in place, and is already influencing the market world wide.

Simulcasting

The Company is of the opinion that simulcasting should not be a regulatory or mandatory matter. It is quite likely that new digital content will not convert to analogue and that to simulcast analogue content on a digital platform would be defeating the whole purpose of implementing innovative new technology. One obvious example is a broadcast that closely relates the audio content with a data delivery unable to be transmitted on an analogue platform.

Market pressures and competition will largely govern this aspect of the introduction period. Broadcasters should make their own decision based on their own specific business models as whether to continue to broadcast both analogue and digital content.

Commentary on the potential role for new digital audio platforms and additional regulatory measures including the question of replication of terrestrial services.

We understand that WorldSpace will be making a significant submission on this subject.

Satellite digital multimedia broadcasting (S-DMB) is the capability for broadcasting digital data files containing audio, text, pictures, or video

WorldAudio currently enjoys a relationship with WorldSpace that is examining the future possibilities of satellite delivery internationally and domestically of free to air digital multimedia content. WorldAudio is currently conducting Australia's first consumer trial of S-DMB in Darwin.

The results of this first ever consumer trial of its kind in Australian broadcasting will be provided to Government and its agencies on completion.

Commentary on other relevant matters.

CONCLUSION

WorldAudio – Radio 2 is in a position to commence operational free to air commercial digital radio broadcasting now, starting in Melbourne and Sydney and commencing in regional and rural areas of Australia in the short term. Our facilities have been purpose built for its introduction.

The Company will cooperate with industry leaders, manufacturers, government departments, service providers, and retailers in whatever way we can to be proactive and productive in the introduction, implementation and operation of digital radio broadcast technology.

Headquartered in the Sydney Olympic Park Homebush, WorldAudio Limited via its 100% owned subsidiary Radio 2 broadcasts in all states and territories with up to 50 AM commercial radio sites. The National AM network has an estimated population reach of over 12 million people all ages. WorldAudio – Radio 2 was the first commercial broadcaster in Australia to trial terrestrial distribution of free-to-air digital radio broadcasting (DRB) on VHF band III channel 9 in Melbourne, the DRB trials will continue to May 2006.

Radio 2 is the only national commercial digital broadcaster on the digital audio channel of the Austar / Foxtel subscription TV platform currently received in an estimated 1.4 million homes Australia-wide [Austar Channel 2, Foxtel Channel 831]. Radio 2 can now be heard via the World Wide Web as a digital content stream 24/7 at www.radio2.com.au

WorldAudio Limited is a credible existing business listed on the Australian Stock Exchange. The Company owns Commercial Radio Broadcast licences issued by Australian government agencies; The Australian Broadcasting Authority and The Australian Communications Authority.

The Company pays licence fees to government in line with any other existing commercial radio broadcaster, and is obligated under law to abide by the terms of Broadcast Services Act. WorldAudio through its 100% owned subsidiary Radio 2 provides a commercial radio service to a growing audience. WorldAudio – Radio 2 is contributing to choice and diversity by providing a consumer benefit to regional and rural areas including all major metropolitan areas Australia-wide.

WorldAudio – Radio 2 is ready willing and able to migrate to the next level of broadcast technology, digital radio broadcasting, at the same time and in line with any other incumbent commercial radio broadcaster in Australia.

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Readers are invited to sample the new **Radio 2**
National programming streaming live on the internet from May 2nd 2005 on
www.radio2.com.au

