



AM radio issues

An examination of technical and engineering issues, their impact on the AM radio business model, and digitalisation.

ISBN 0 642 78343 8

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Published by the Australian Communications and Media Authority
201 Sussex Street
Sydney NSW 2000

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Preface

The report was prepared in May 2005 for presentation to the Minister for Communications, Information Technology and the Arts.

The facts and circumstances reported are as at that time.

Summary

ACMA (as the Australian Broadcasting Authority) has been aware for some time of concerns about some of the regulatory settings applying to AM radio. Such concerns arise out of the perception that AM radio suffers from technical inadequacies and that these inadequacies are becoming more significant with time. In turn, AM radio can be considered a less attractive asset compared to FM radio, which should perhaps be subject to different planning and ownership and control rules.

In the light of these concerns, the ABA decided in early 2005 to provide a report to the Minister for Communications, Information Technology and the Arts, Senator the Hon. Helen Coonan, on AM radio issues. As ACMA, it is publishing those findings to assist in broader consideration of issues affecting AM radio, and to inform the development of policy for the use of AM in the future. As the report was prepared in May 2005, the facts and circumstances reported are as at that time.

The report examines three key issues in relation to AM radio. The first comprises technical, planning and site issues affecting the provision of AM services.

The second issue is the impact of these technical, planning and site issues on the business model of AM. For instance, the quality of AM transmissions has tended to limit its application for music and can affect the attractiveness of potential program formats. This, together with the higher costs associated with AM transmission facilities, leads to AM services generally being less profitable than FM services. This can, in turn, result in AM licences being traded at a discount to FM licences in the open market.

The report also considers a third key issue, digital radio, to analyse how this development might impact on the future of AM.

This report canvasses only information that is publicly available to ACMA.

Technical, planning and site issues

- AM radio generally has poorer sound quality and is less suited to music formats than FM.
- AM radio is more prone to ‘noise’ caused by other sources of electromagnetic radiation than is FM radio. This ‘noise’ is also increasing over time and is affecting AM coverage, particularly in urban areas.
- As AM radio can travel further than FM, there is a subset of AM services that can provide what FM cannot: very wide coverage in regional and rural areas.
- The cost of establishing and maintaining transmission facilities is higher for AM than for FM.

- Encroaching residential development in metropolitan areas and consequent community concern over potential risks from the sites puts pressure on AM radio operators to move the location of their transmission facilities, but it is difficult to find suitable alternative transmission sites.

Audience, profit, and ownership and control issues

- The dominant formats currently on AM radio—talk programming—appeal to older listeners.
- The introduction of commercial FM services since the 1980s has seen AM progressively lose younger listeners to FM radio services, and the shift of mainstream radio listeners away from AM.
- AM radio has maintained its audience share with older listeners and recently in metropolitan areas AM talk formats have performed well in terms of overall share.
- Audience share trends for ABC services in Sydney, Adelaide and Melbourne show increasing support for AM among most demographics.
- AM services comprised 42.5 per cent of the commercial radio licences in Australia, but accounted for only 28 per cent of total radio advertising revenue in 2002–03 or 15 per cent of the profit.
- Metropolitan AM services accounted for approximately 19 per cent of total radio advertising revenue in 2002–03, and regional AM services accounted for approximately nine per cent of the total advertising revenue.
- Of all commercial radio services (AM and FM), regional AM services were least likely to be profitable in 2002–03.
- With more than 260 commercial radio broadcasting licences in 97 distinct market areas, the structure of the commercial radio industry provided some opportunity for economies of scale to be achieved for AM services: as part of a network of licences across a number of areas; as part of a pair of licences within an area; or in some combination of the above.
- Networking opportunities provided by the concentration of control of AM licences across licence areas was high, with 10 companies in a position to exercise control of 75 per cent of the AM licences.
- Economies of scale within licence areas have also been realised, with around half of the commercial radio licences in regional areas owned by a monopoly in that market, and more than 95 per cent are owned by a monopoly or duopoly in that market. If racing radio services are excluded, 72 per cent of the AM licences in regional areas were owned in monopoly markets. Of these, 98 per cent were held as a pair with one FM licence. In these monopoly markets, the AM services averaged higher revenues than their FM counterparts. However, the profitability of the AM service was lower.
- There were 11 cases of an owner of one AM only in an area in competition with other services in that area. These licences averaged a loss of around \$95,000, and seven of these AM licences recorded a loss.
- Around 20 per cent of all AM commercial radio licences have been traded each year since 1994 (with the exception of 2001 and 2002). There has been a steady market in

the sales of commercial radio AM services, but the precise value of this market is unclear.

- With a key exception, it is likely that the value of an AM service would be generally much lower than an FM service. The value of a strongly performing AM metropolitan service is likely to be higher than a poorer rating FM service in the same market.

Conclusions

The AM radio market continues to evolve. Over time, there has been a shift of listeners from AM to FM and greater competition for audiences with the introduction of new FM radio services. At the same time, talk formats on metropolitan AM radio continue to perform relatively well in terms of audience share and profitability. In the early 2000s, the metropolitan AM sector has also seen an improvement in relative audience share against the FM sector. Recent audience share trends for ABC services in Sydney, Adelaide and Melbourne suggest that AM radio, as a medium, is capable of some degree of reinvention.

In monopoly markets where there is one AM and one FM service, the AM service receives higher average revenues than the FM service, but its profitability is lower. In competitive markets where an owner has one AM and one FM, the AM service generally receives lower revenue and its profitability is lower than the FM service owned by that person.

In the majority of cases, the opportunity for owners of AM licences to achieve economies of scale with other licences has already been realised, either within the same market, or across a number of markets.

Despite a lack of clarity about the precise value of AM licences, it is likely that the price an AM licence would attract upon sale, or has attracted in previous sales, would factor in, or would have factored in, its current performance and likely future performance. Further, as more than three-fifths of the available AM licences have been sold or partially sold in the last five years, it would seem that there is still capital interested in investment in AM despite technical, audience and profitability issues.

The steady market of AM licences for sale over time, and the inclusion of some high performing stations over the period would suggest that the AM sector is not in terminal decline.

ACMA will continue to monitor commercial AM market share, the industry's financial situation, and ownership and control issues affecting AM services.

At this stage ACMA does not see a need for AM specific changes to the regulatory settings governing control of commercial licences, particularly in metropolitan markets. However, if there is an increase in the number of services licensed as commercial radio broadcasting services that have narrow or niche formats, it might be appropriate to consider whether a legislative framework that would allow commercial radio services to convert to open narrowcasting services would be appropriate in the future. ACMA does not have any view on the merits of changing the control rules in relation to commercial radio broadcasting services generally.

Digitalisation

- There is uncertainty over the policy settings for digital radio and therefore uncertainty about the implications of digital radio for AM.
- The key digital radio technologies are Digital Audio Broadcasting (DAB) and Digital Radio Mondiale (DRM). Each has distinct characteristics that may affect AM.
- In addition to resolving current technical problems, conversion to DAB would allow AM operators to achieve greater audio clarity, ranging from FM to near-CD sound quality. However, DAB appears poorly suited to achieving equivalent coverage to wide-area regional AM radio.
- DRM also offers higher sound quality than AM, although only to around 'FM quality'. It is also less flexible than DAB in terms of ancillary data services. However, it is designed to operate on HF and MF frequencies that can achieve equivalent coverage to wide-area regional radio. However, there is now a move by DRM consortium to extend its use up to 108 MHz including the FM band.
- This comparison suggests DAB may be well suited for digital radio in urban areas but more problematic as a replacement for wide-coverage regional AM.
- The feasibility of conversion models involving DRM as well as DAB will depend on the availability of affordable dual-system receivers. While the European market appears set on adopting both DAB and DRM, the current generation of affordable receivers are DAB only. Dual system DAB/DRM radios are expected to be available in Europe late 2005.

Conclusions

Given the ability of the two digital radio technologies to meet different challenges posed by AM, ACMA will continue to monitor developments with both DAB and DRM technologies to identify appropriate digital solutions for AM radio.

ACMA (as the ABA) has sought public submissions on the merit of placing restrictions on the planning and allocation of broadcasting services in certain frequency bands that may be suitable for digital radio. In this context, ACMA is interested in receiving information on the merit of placing restrictions on vacant AM frequencies that may be of value either for DRM trials or for the provision of digital radio services under a DAB/DRM 'hybrid' model.

The majority of disadvantages experienced by AM services in the analog environment need not be replicated in the digital environment. Conversion of analog AM to FM ahead of digitalisation should therefore be considered in the framework of a holistic digitalisation policy.¹

¹ It should be noted that the Minister for Communications, Information Technology and the Arts announced such a framework for the introduction of digital radio in Australia on 14 October 2005, Media release 119/05
http://www.minister.dcita.gov.au/media/media_releases/framework_for_the_introduction_of_digital_radio

Technical and site issues

SERVICE QUALITY OF AM AND FM

Frequency specifications

AM broadcasting services use the medium frequency (MF) band and occupy the frequency range between 526.5 kHz and 1606.5 kHz, with each channel designated by its nominal carrier frequency. There are 120 AM channels from 531 kHz to 1602 kHz spaced at 9 kHz intervals; however, each channel occupies a bandwidth of 18 kHz.

FM broadcasting services use frequencies in the very high frequency (VHF) band, which are higher than the frequencies used by AM services. FM services are located in the frequency range 87.5 MHz to 108.0 MHz. FM channels are spaced at intervals of 200 kHz from 87.7 MHz up to and including 107.9 MHz. Each channel has a bandwidth of 200 kHz.

Audio frequency range

The quality of AM reception is generally poorer than FM as the AM channel bandwidth is relatively 'narrow' compared with FM radio. Due to the limited bandwidth of transmissions, the audio frequency range of AM is limited to 50 Hz to 7 kHz, whereas compact discs (CDs) for example have an audio frequency range of 20 Hz to 20 kHz, which is roughly equivalent to the full audio frequency range detectible by the human ear. Because of the limited audio bandwidth, the program format of AM radio services tends to be oriented towards applications involving speech rather than music. Typical services include talk and talkback style services, as well as racing radio services.

The limited audio frequency range of AM services is exacerbated by the design of most AM receivers, which have been constructed to filter out frequencies extending more than 4 or 5 kHz on each side of the carrier frequency.² This means that these receivers do not operate to effectively receive the full range of audio frequencies broadcast by AM services, further limiting the perceived service quality of AM radio.

² In some areas, like Europe and the USA, AM services on adjacent channels have been allocated at closer distances than in Australia. In an effort to minimise interference, manufacturers have built AM receivers that filter these overlapping frequencies.

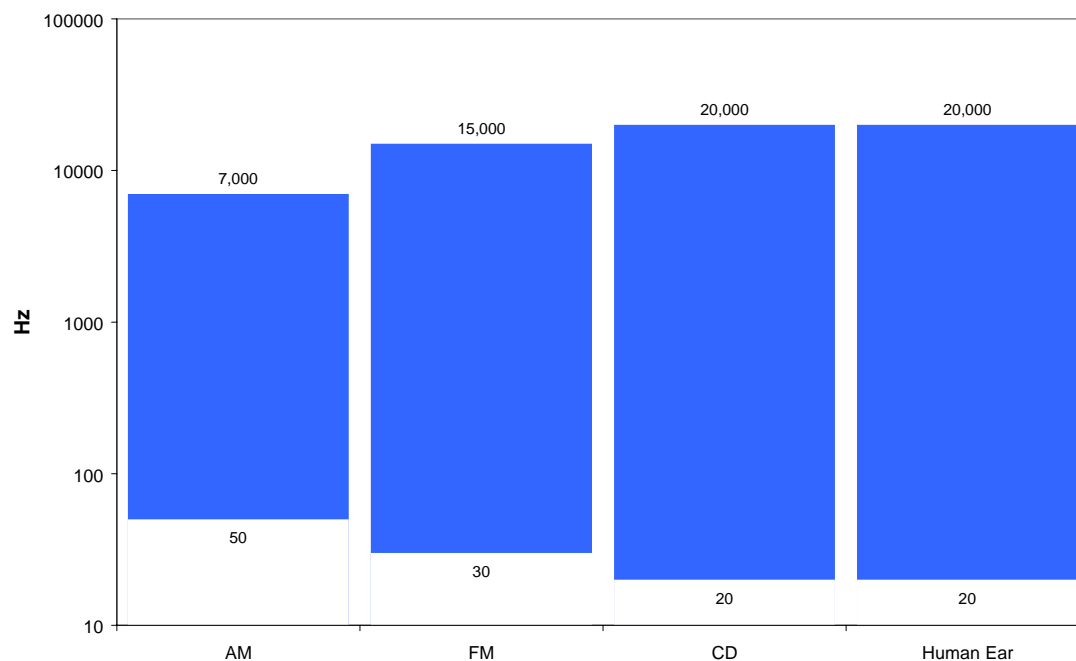


Figure 1 – Audio frequency range of AM, FM and CDs compared to the average human ear

FM radio's modulation system and greater channel capacity allows it to carry a larger amount of information than AM services, which contributes to better quality audio reception. The audio frequency range of an FM service is typically 30 Hz to 15 kHz, making it more popular for music oriented program formats.

INTERFERENCE

Physical environment

AM broadcasts are more prone to interference from environmental and man-made sources than FM broadcasts. This interference is variable, depending on the local conditions. Interference is generally higher in business and industrial areas of metropolitan areas and is lower in residential and rural areas. Over time, the increasing use of consumer electric and electronic devices and the greater reliance by industry on electromagnetic devices has caused the general level of interference to AM radio to also increase. It is not known exactly when or whether the increasing level of interference will become intolerable.

Day and night

The coverage area of an AM broadcast may also decrease during the night due to interference from other distant AM broadcasting services. This is because at night signals travel great distances (sometimes more than a thousand kilometres) by reflecting back to earth from the ionosphere. This phenomenon does not occur during the day as the sun's radiation changes the characteristics of the ionosphere. Due to this long distance propagation, Australia must coordinate its use of AM frequencies with neighbouring countries.

Long distance night time propagation and consequent interference to AM services interstate and internationally prevents most AM services from being able to increase power at all times of the day. Increasing the power only during the day is a possible way

of increasing the coverage of the AM signal in the day time, while not sending the signal too far at night. This is known as day/night switching, and to date has only been implemented by one AM station in Australia.

While day/night switching offers a theoretical technical benefit to AM broadcasters, the political reality is that local councils and other planning instrumentalities are likely to be reluctant to allow such increases in the transmission power of services, for fear that the electromagnetic radiation would be harmful to residents in areas near to the transmitter. Urban encroachment on existing AM sites, and a lack of suitable alternative sites in or around major cities, has considerably reduced the potential benefits of day/night switching as a measure for addressing rising levels of interference.

FM interference characteristics

FM broadcasts are less prone to interference from environmental and man-made sources than AM broadcasts. Frequency modulation is more immune to electromagnetic ‘noise’ than amplitude modulation and environmental and man-made electromagnetic ‘noise’ levels are lower at the higher frequencies used by FM broadcasts. This factor also contributes to the significantly better reception quality of FM broadcasts.

A further advantage of FM broadcasts is that the coverage does not change between day and night time. The main signal impairment for FM broadcasts is known as multipath propagation: multiple signals arrive at the receiver after reflecting off buildings or hills. These multiple signals can cancel each other out. The effect is most noticeable in slowly moving vehicles or when the program content is relatively quiet.

In an urban environment where the coverage of the proposed service is intended to include no more than the metropolitan centre in question, the cost of establishing an FM broadcast transmission facility is generally less than for an AM broadcast facility and the on-going costs are also lower.

PROPAGATION

AM suited to distance propagation, along the ground

AM radio has a technical advantage over FM radio in one key respect. The propagation characteristics of AM radio are such that it is better suited than FM to wide area transmission in sparsely settled areas. The potential coverage of an AM service in remote or rural areas can be superior to an FM service, particularly in areas where there is no suitably high mountain on which to site an FM transmitter.

The surface of the earth plays an important role in AM broadcasting services, as ‘ground’ waves are essentially responsible for the propagation of electromagnetic radiation in the MF radiofrequency band. Therefore, AM broadcasting stations are sited at relatively flat locations with high ground conductivity. High ground conductivity is usually found in wet areas, like swamps. To improve local ground conductivity ‘earth mats’, consisting of radial wires, extend from the base of the tower.

AM broadcast antennas are generally large, ranging between 30 m and 200 m tall. As they are so large, the mast or tower also doubles as the antenna. The whole structure therefore actively radiates the AM signal.

The area covered by signals emanating from an AM broadcasting station is related to the frequency of the signal. Where the power of the transmitter is the same, a lower frequency will cover a greater area than will a higher frequency.

FM propagation is through the air, using line of sight

FM broadcasts use a different propagation mode than AM, propagating through the air rather than along the ground. Generally, FM broadcast transmission antennas need to be situated where they have line-of-sight to the area to be covered. Some diffraction of the signal around obstacles can extend the coverage into other areas that are not in the line-of-sight of the transmitter. Due to this different propagation mode, FM transmission towers are typically sited on mountains, hilltops or on tall buildings. The FM antenna is also attached to the tower, rather than forming part of it as in the case of AM radio.

As FM services rely on line-of-sight to propagate and AM services are transmitted along the ground, AM services can travel over the horizon and beyond obstacles that would block the transmission of FM in rural areas. For example, in Western Australia it is possible for the AM national regional radio service 6DL (represented by the black lines in the map, see Figure 2) to cover an area of almost the entire south-west corner of Western Australia. In contrast, the FM national radio service, ABC Radio National, requires a number of transmitters to cover a similar area, and yet still only manages to reach the major population centres.

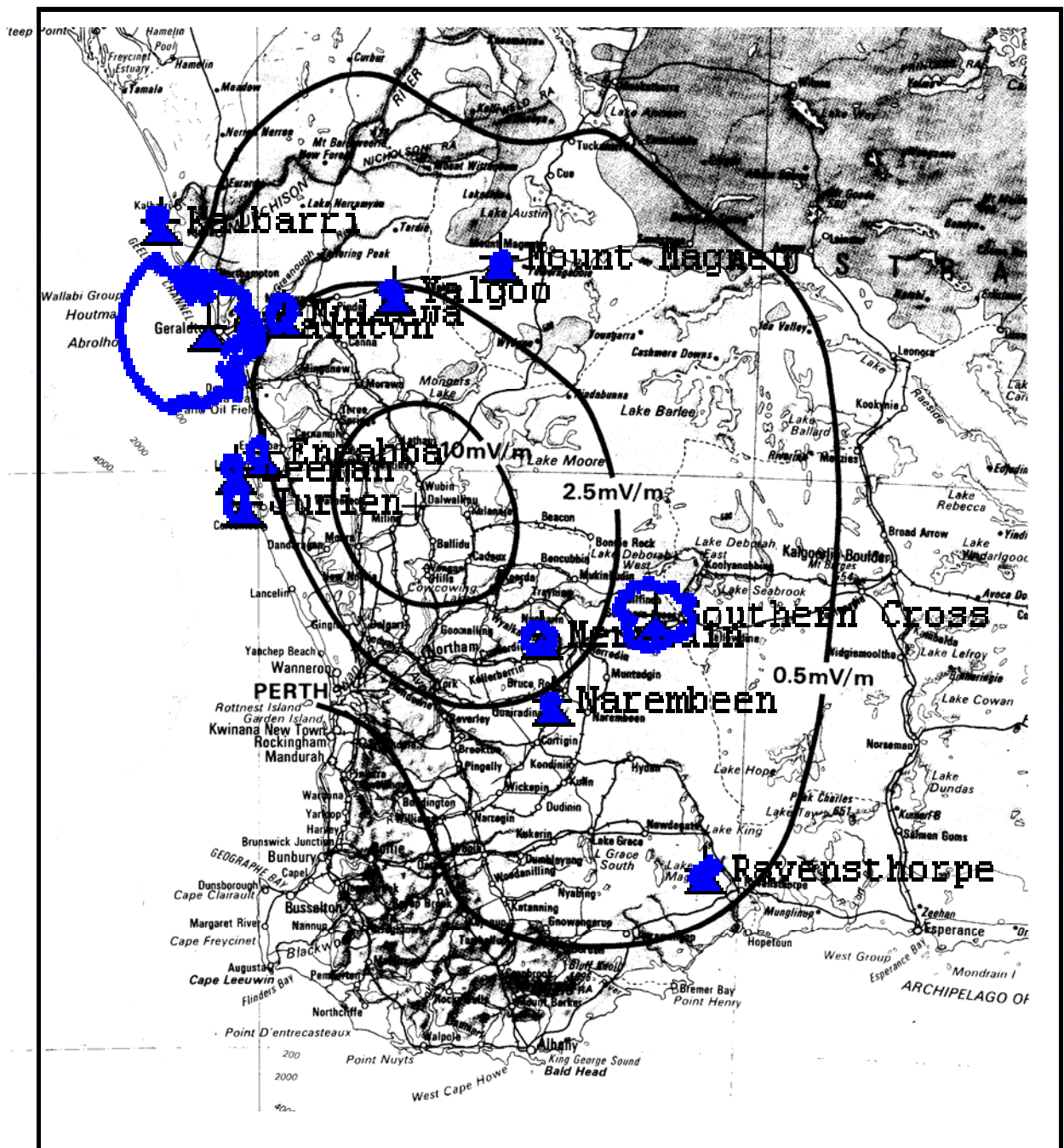


Figure 2 – AM and FM coverage areas compared (AM is represented by the black lines (each signifying different field strengths of the service), FM is represented by the blue lines).

SITE ACCESS AND LOCATION

Development pressures

Site tenure

As development encroaches on existing AM transmitter sites, community pressure builds for the transmitter to be relocated or reconfigured. For example, there are five transmitter sites in the Homebush Bay area in Sydney, which currently house the transmitters for the AM services of 2GB, 2UE, 2SM, 2CH, 2EA and 2KY. The tenure of these services is uncertain due to developmental pressures and consequent community concern over potential risks from closer residential proximity to the sites.

In metropolitan areas like Sydney where the availability of land is scarce, a suitable site alternative to Homebush Bay is likely to be on the periphery of the city. If so, the coverage of the re-located transmitter is unlikely to be able to match that of the existing services at Homebush Bay. If the service was simply moved from Homebush Bay to a location at the edge of Sydney with no amendment to the operating parameters of the service, this would cause reception difficulties for some current listeners of AM services. In order for an AM service to achieve the same coverage from this distance, much higher transmission powers would be required. Any scope for an increase in power to the service would be constrained by the need to ensure interference to other services in Australia and elsewhere is minimised. The consequent high overspill of this service into neighbouring licence areas, and the electromagnetic radiation or interference issues that would arise at the site would further limit the scope for such an increase of power.

Community concerns about radiation from AM services

Electromagnetic radiation (EMR)

In March 2003, the former Australian Communications Authority (now ACMA) made the *Radiocommunications Licence Conditions (Apparatus Licence) Determination 2003*, which mandated the maximum permissible emission from broadcasting services, including those licensed in the AM band. The determination specifies that the maximum field strength of any particular broadcasting service measured at a point that is accessible by a member of the public must not exceed the reference levels for general public exposure defined by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).³ The 'reference level' for the general public for services in the AM band is an E-field strength of 86.8 V/m rms.⁴ The determination applies to national broadcasters and narrowcasters, and special conditions requiring compliance with the ARPANSA standard are applied to each AM commercial radio broadcasting service's transmitter licence.

While the field strength of an individual broadcasting service within a given frequency range may not exceed the allowable health limit for general public exposure as specified by the ARPANSA, the cumulative field strength of all broadcasting services emanating from a site or an area also needs to be considered by the owner or operator of the transmission site concerned.

³ See Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields — 3 kHz to 300 GHz.

⁴ Alternatively, the 'reference level' for the general public for services in the AM band is an H-field strength of $0.729/f$ A/m rms, where f is the frequency of the service in MHz.

Electromagnetic compatibility (EMC)

High levels of electrical fields from a nearby AM transmitter can also cause electrical devices to operate as if they were a radio receiver.⁵ This effect is caused by problems with the electromagnetic compatibility of the device.

ACMA's *Technical Planning Guidelines*, developed under section 33 of the *Broadcasting Services Act 1992*, provide that no more than one per cent of the population of the licence area of an AM service should reside in an area where the maximum field strength exceeds 1 V/m. This limit is intended to ensure the minimisation of the number of radio receivers that are exposed to high electrical field strengths to avoid radio receiver overloads.

Experiences of electromagnetic compatibility issues may cause potential residents of apartments in the vicinity of transmitters to be concerned about the additional effect of the electromagnetic radiation on their health, despite assurances to the contrary from government agencies. As outlined above, the level of electrical field strengths that would cause electromagnetic compatibility issues in electrical equipment is much lower than would be required to cause health problems for an individual. However, the emotional impact of encountering a 'talking toaster', or receiving a slight electric shock from a metal object may create popular apprehension that health also could be affected. This may be sufficient to dissuade potential residents from moving into an apartment.

Occasional media reports drawing links between electromagnetic radiation and various possible health effects continue to feed public anxiety about facilities such as AM transmitters. It is important that broadcasters continue to publish objective scientific information about electromagnetic radiation in the light of the fact that broadcast towers produce weak radiofrequency (RF) electromagnetic energy (EME) exposure levels in the everyday environment. The weight of national and international scientific opinion is that there is no substantiated evidence that RF EME emissions associated with living near a broadcast tower poses a health risk.⁶

The publication of scientific data regarding actual transmitter site electromagnetic radiation levels may only go some way to persuading the public of the relative safety of residing close to transmission sites. In order to assist local planning instrumentalities conduct informed public consultative processes in future, the difference between electromagnetic compatibility issues and issues of excessive electromagnetic radiation could be highlighted in community communications.

Interface with state and local planning instrumentalities

While the services at Homebush Bay have been in operation for more than 50 years and have not significantly changed since 1985,⁷ local and state planning instrumentalities have recently permitted residential developments, like the Waterside Apartment development, to be constructed close to the transmission sites. There have also been contentious sites in other metropolitan areas. Thus, the encroachment by residential development onto long established AM transmission sites has raised the level of community concern over possible risks and reduced the scope for the introduction of

⁵ The colloquial reference describing this phenomenon is sometimes known as the 'talking toaster' effect.

⁶ Committee on Electromagnetic Energy Public Health Issues EME Series Fact Sheets *EME Series No.10 - What about broadcast towers – are there any health effects?* www.arpana.gov.au/pubs/eme_comitee/fact10.pdf

⁷ The only change to facilities at Homebush Bay since 1985 has been the change of frequency for the 2EA service.

measures designed to improve the coverage of AM services in metropolitan areas, like day/night transmitter power switching.⁸

It is not suggested that the vesting of a veto in Commonwealth radiofrequency planning agencies in relation to planning near transmitter sites would resolve the issue. The land use required for an AM transmitter site is quite large and given the value of land in metropolitan areas is also quite high, a balance must be struck between the importance of the radio industry and the value of other uses to which the land could be put.

Risks from transmission masts

The owners of transmission sites are ultimately responsible for the safety of people and assets in the vicinity of the mast. Traditionally, site owners have secured sufficient land to be in a position to ensure that, were a mast to fall over, the risk of damage would be minimal. However, in areas where land values are high there is pressure on site owners to reduce the safe margin around the mast, so the traditional method of managing the risk becomes less effective. This does increase the risk profile of the unlikely event of mast failure, since it increases the possible impact as higher value assets and residential tenancies populate the zone while leaving the possibility of occurrence unchanged.

Current proposals for Homebush Bay

In May 2004 Commercial Radio Australia submitted a proposal to the Planning Department of the New South Wales Government for the consolidation of the existing six medium broadcasting band services on two masts: one at the 2KY site and the other at the 2CH site. This would reduce the number of masts in the area by three, which may itself diminish risk from mast failure.

The then ABA reviewed the Commercial Radio Australia proposal at the time and indicated that the proposal would be likely to contain the concentration of maximum signal levels of 1 V/m and over for radio receiver overload to a smaller area than with the current arrangement of four transmitter sites. This would consequently reduce the population of radio receivers that would be exposed to signal levels of 1 V/m and over. The Planning Department of the New South Wales Government has since given in-principle approval to the proposal by Commercial Radio Australia.

CONCLUSIONS

ACMA is working with the New South Wales Government to facilitate alternative solutions to the transmitter site issue in Homebush Bay.

ACMA will liaise with local councils before approving significant changes to AM services and will encourage the relevant planning authorities to work closely with broadcasters and public in the planning approval process around transmitter sites.

⁸ See pp. 8 and 9 for a definition of day/night switching.

Audience, profit and ownership and control issues

AM RADIO FORMATS

As the sound quality of AM radio is technically inferior to FM radio, the formats found on AM radio tend towards those formats that do not require the full audio frequency perceptible by the human ear. While there are AM radio services that are music-based services, AM services are largely talk-based.

The predominant highest rating format of commercial radio broadcasting services on AM radio is talkback. However, some AM services also carry Gold or Easy Listening music formats. These formats are found in both regional and metropolitan areas of Australia. Commercial radio broadcasting services on the AM band are in competition with commercial radio broadcasting services on the FM band. AM services have tended not to run music formats that are identical or similar to those run by FM services in the same area, preferring instead to compete for different demographic sectors or appeal to different listener preferences.

National radio services on the AM band in metropolitan areas are primarily talk-based, with news, current affairs, parliamentary broadcasting and talkback formats being the key services available.

ACMA maintains a register of narrowcasting formats pursuant to the licence condition imposed on high power and networked low-power open narrowcasting radio services using both the AM and FM bands.⁹ This register indicates that the majority of AM narrowcasting services carry the predominantly talk-based format of racing radio.¹⁰ The other formats of AM open narrowcasting services include foreign-language services and country music services. Both of these latter service formats carry talk as well as music.¹¹ All three AM narrowcasting formats are also found on open narrowcasting radio services using the FM bands.

Whether an open narrowcasting service is located in the AM or FM band seems to have less relevance to its format than other factors. Open narrowcasting services are tailored for a niche market, and the availability of spectrum for open narrowcasting services is

⁹ http://www.acma.gov.au/ACMAINTER:STANDARD::pc=PC_90183

¹⁰ Racing radio consists primarily of calls of horse and dog races, but also broadcasts calls of some other sporting fixtures.

¹¹ In the case of foreign-language services, the format of the service is quite similar to commercial radio music formats, with talk interposed between songs.

limited. Identifying a niche market that is not served in a particular area would appear to be more important than locating the optimal frequency for the delivery of that format. Once chosen: where there is no alternative, it appears listeners will tune to a service that is unique to an area, regardless of the band it is on.

AUDIENCE

Since 1980, the audience share for AM radio in the five mainland state capital cities has decreased significantly, declining steeply until about 1994 then more gradually after that time for most capital cities. In 1980, AM accounted for 93 per cent of the audience share in the Sydney market, falling to 47 per cent in 1994, and 38 per cent in 2004.¹²

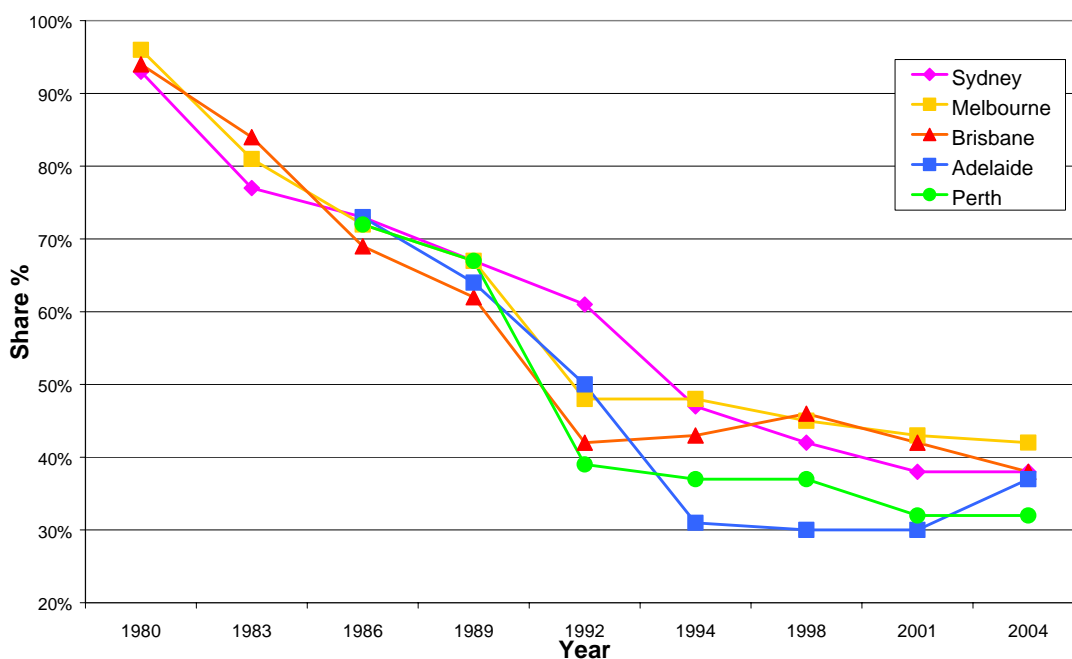


Figure 3 – AM station share – Five mainland state capitals – All people 10+, 1980–2004 (Source: Nielsen Media Research)

The steep decline in AM share of the audience began with the introduction of the first commercial radio services in the FM band from 1980 and continued with the conversion of a number of commercial AM services to FM services in the late 1980s and early 1990s. The decline has flattened since 1994 although the proportion of FM to AM services has continued to increase with the allocation of new commercial FM radio licences in the late 1990s and early 2000s.¹³ The proliferation of FM stations and the diversification of music formats on these stations has led to a major shift of mainstream radio listeners away from AM.

¹² Based on Australian Broadcasting Tribunal/ABA analysis of ratings data from Nielsen Media Research.

¹³ For instance, in 1980, there were nine AM services and three FM services in Sydney participating in the survey. By 2004, there were six AM services and seven FM services.

Music programming has proven to be the most popular radio format across all age groups and particularly for younger listeners. News, information and talkback programs also appeal to a range of age groups, but are of most interest to older listeners.¹⁴

However, when the audience share of AM services in each of the five mainland capital cities is considered together with the number of AM and FM services, a different trend is disclosed. Figure 4 shows the difference between the audience share of AM and the proportion of AM services in that capital city. A result of zero would indicate that AM was achieving an audience share in a particular market which equated to the proportion of AM services in that market. A positive result indicates that the audience share is higher than the proportion of AM services in that market.

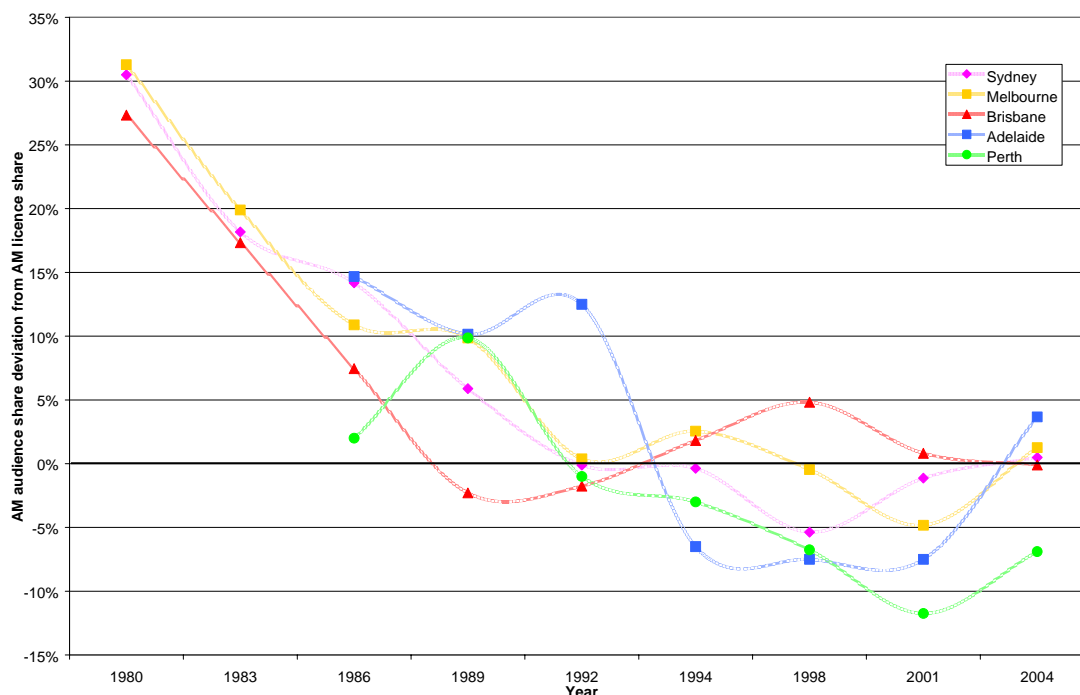


Figure 4 – Adjusted audience share of AM (taking account of the proportion of AM licences in a market)

If AM and FM were equal, it would be expected that the trend would be for the adjusted audience share of AM to be at or around the zero level. Any long-term deviation from zero might indicate some intrinsic feature of AM or FM that suggests the relative merits of the AM or FM bands have a bearing on audience share.

Figure 4 shows that AM radio began the early 1980s with relatively high audience shares when compared with the proportion of AM licences in the market. With the introduction of FM licences (and specifically the introduction of FM commercial radio licences) in the early 1980s and the conversion of some AM to FM licences in the late 1980s and early 1990s, the AM audience share became lower than might otherwise be expected. This might be attributed to the increasing popularity of FM and the transition of some listeners as some of the popular AM stations converted to FM. Alternatively, it could be due to the

¹⁴ *Understanding community attitudes to radio content*, ABA, Monograph 11, October 2003, pp 31–33.

number of new commercial and community services introduced into the FM band and the relatively static nature of the AM band with respect to new services. In the early 2000s, the AM sector saw a general improvement in relative fortunes, as its audience share tends upwards towards (and in some cases above) zero. This rise in relative fortunes for AM extends to the late 1990s for AM in Sydney.

The unusual peak in Adelaide in 1992 can be attributed to the conversion of two AM services to FM and the introduction of one community FM radio station and the national parliamentary broadcast service on the AM band. These changes appear not to have adversely affected the absolute audience share of the remaining AM services.

The peak in Perth in 1989 may be accounted by the introduction of two community services and the ABC national Triple J service. These services do not appear to have attracted sufficient audience share to adversely affect the total AM audience share when adjusted for the proportion of AM services in Perth.

Figure 5 shows the current talk and talkback formats offered by AM radio services have greatest appeal to older listeners. An analysis of the demographics in the capital cities reveals that listening to AM is highest amongst listeners 55 years and older. The share of the audience is lowest for listeners aged 10 to 24 years, increasing with the age of listeners.

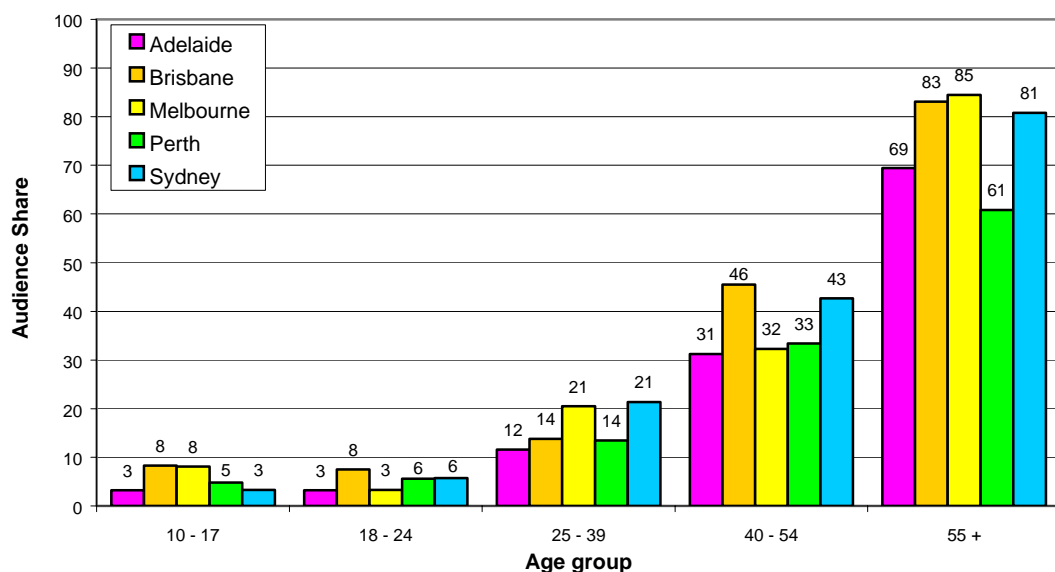


Figure 5 – AM station share by age – Five mainland state capital cities (Survey 2) 2003 (Source: Nielsen Media Research)

Station share trends since 1989 show that AM services in Sydney and the other mainland state capitals have largely retained their share of listeners in the 55 years and over age group (particularly in Brisbane, Melbourne and Sydney), but have progressively lost the younger age groups to FM radio services.

Figure 6 shows this trend for the Sydney market. While AM formats clearly appeal more to older listeners, it is not clear whether or to what extent younger listeners, who grew up with FM, will increase their AM listening as they age.

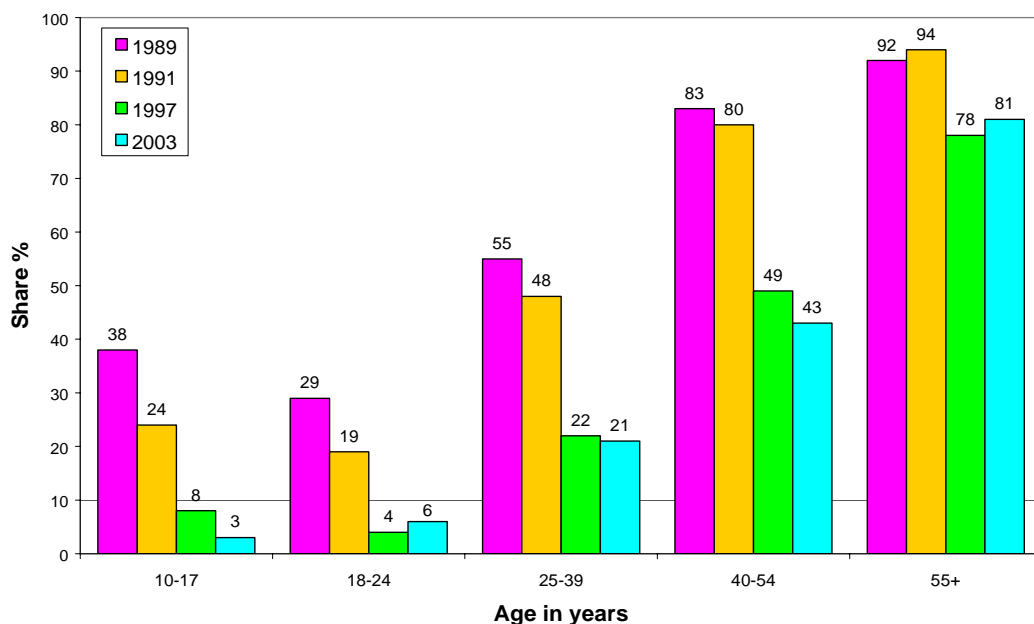


Figure 6 – AM station share by age – Sydney, 1989–2003 (Source: Nielsen Media Research)

There is some fluidity in the market at least in the major metropolitan areas of Sydney and Melbourne where there has been a resurgence of audience support for the AM formats of talk and talkback.^{15,16} Topping the station share figures for the fifth and eighth survey periods of 2004 were commercial AM radio stations 2GB in Sydney and 3AW in Melbourne, both of which carry the talkback format. In Sydney, talk format national radio AM broadcasting service ABC702 achieved third in both surveys, while the talkback format commercial radio AM broadcasting service 2UE was fifth in the fifth survey and fourth in the eighth survey. In Melbourne, the talk format national radio AM broadcasting service ABC774 rated fourth in the fifth survey and second in the eighth survey.

Commercial FM radio topped the station share figures in Adelaide, Brisbane and Perth in the fifth survey of 2004. The AM radio stations with the highest station shares were ranked second in Adelaide, fourth in Brisbane and third in Perth.

ABC AM audience share statistics from 1997 to 2003 in Sydney, Adelaide and Melbourne show an increasing share over the five years for nearly all demographics.¹⁷ This would suggest that AM radio, as a medium, is capable of some degree of reinvention.

Trends in commercial FM radio also have the potential to shape the radio market. For example, a number of commercial FM stations are experimenting with formats by

¹⁵ See 'Listeners tune out music for the sound of talkback', *Sydney Morning Herald*, 11 August 2004, p. 7; 'Talk radio on the crest of airwaves', *Australian*, 11 August 2004, p. 3; 'Old Aunty really knows what she is talking about: life really does begin at 40', *Sydney Morning Herald*, 8 December 2004, p. 3; and 'meanwhile, back in the mainstream, 3AW picks up after Stan', *The Age*, 8 December 2004, p. 3.

¹⁶ It is unclear the extent to which the 'resurgence' of AM radio in the metropolitan markets is matched in regional areas as station share figures are not readily available.

¹⁷ The exception is the 10–17 age demographic in Adelaide and Sydney, which decreased from 2.7 per cent to 2.5 per cent over the period in Adelaide, and from 2.3 per cent to 1.3 per cent over the period in Sydney. Also, the 18-24 demographic in Melbourne declined from 3.2 to 2 per cent (Source: Nielsen Media Research).

changing their program mix to include more talkback.¹⁸ This is a response to people accessing music in new ways, audience desire for greater interaction with radio personalities, and increasing competition between FM stations. The question arises about the extent to which commercial FM stations might increasingly meet listeners' needs for talk programs.

OWNERSHIP AND CONTROL OF COMMERCIAL RADIO LICENCES¹⁹

Current ownership and control rules

The Broadcasting Services Act permits a person to be in a position to exercise control of no more than two commercial radio broadcasting licences that have the same licence area.²⁰ There is no distinction made between licences that use the AM band, licences that use the FM band, or licences that do not use the broadcasting services bands at all.

Together with the limitation on control of more than two commercial radio licences in an area are ancillary prohibitions. For example:

- a person must not be a director of a company that is or companies that are in a position to exercise control of more than two commercial radio broadcasting licences in the same licence area or
- a person must not be in a position to exercise control of two commercial radio licences in a licence area, and be a director of a company that is in a position to exercise control of another commercial radio broadcasting licence in that area or
- a person must not be a director of a company that is or companies that are in a position to exercise control of two commercial radio broadcasting licences in an area and be in a position to exercise control of another commercial radio broadcasting licence in that licence area.²¹

There is no prohibition preventing a person who is in a position to exercise control of a commercial radio broadcasting licence from also operating one or more open narrowcasting radio services in the same area.

Radio ownership concentration

There were 108 AM commercial radio broadcasting licences in the broadcasting services bands and an additional 12 not in the broadcasting services bands, although these services are technically inferior to the AM services in the broadcasting services bands.²² There were also 153 FM commercial radio broadcasting licences in the broadcasting services bands.

¹⁸ 'Is talk the new FM?' segment on *Mondo Thingo*, ABC television, Thursday 7 October 2004. Transcript at www.abc.net.au/thingo/txt/s1215101.htm

¹⁹ The data in this section is from May 2005, when this report was prepared.

²⁰ See section 54 of the Broadcasting Services Act.

²¹ See section 56 of the Broadcasting Services Act.

²² The 12 commercial radio broadcasting licences that were not in the broadcasting services bands use the MF bands and amplitude modulation to transmit their signals and hence are technically AM services. However, non-broadcasting services bands AM licences are technically inferior to AM services in the broadcasting services bands as they operate using a narrower bandwidth, and do not receive the same interference protection as services in the broadcasting services bands.

This section reviews the trends in ownership and control of AM commercial radio licences in the broadcasting services bands, up to May 2005. The AM licences outside the broadcasting services bands have been excluded from this review as they are technically inferior, and are therefore considered as a separate category from the AM commercial radio broadcasting licences in the broadcasting services bands.

Forty-one companies controlled the 261 AM and FM licences that use the broadcasting services bands. The five companies that controlled the most of these broadcasting licences in their own right were in a position to exercise control of 60.92 per cent of the licences on issue, while the top ten companies controlled 73.18 per cent of the licences on issue. In relation to control of AM licences using the broadcasting services bands, the top five companies controlled 60.19 per cent of these licences, while the top ten companies controlled 75 per cent. While control of the AM radio industry is quite concentrated, the concentration of control of AM licences is in line with industry norms.

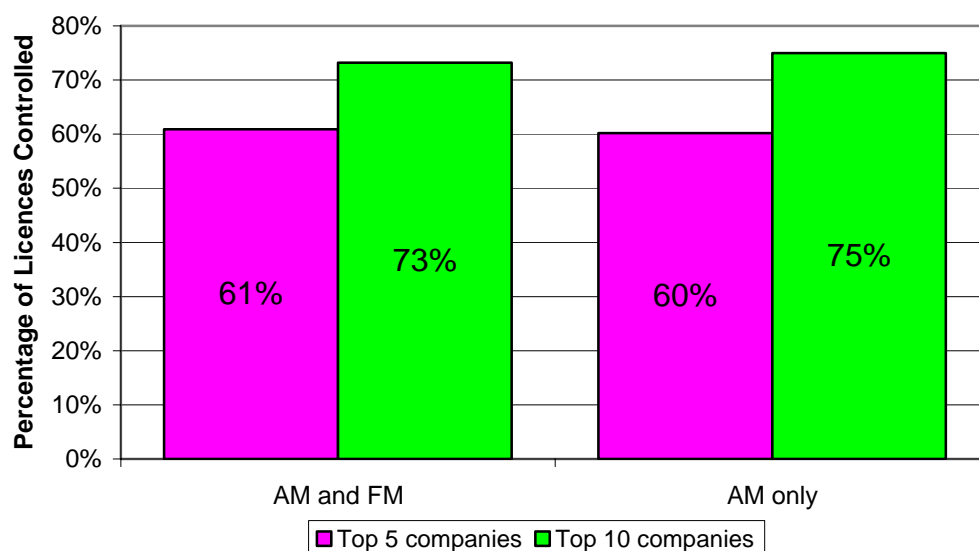


Figure 7 – Concentration of control of commercial radio licences

Macquarie Bank Limited controlled the most licences in both the AM and FM broadcasting services bands, due to its purchase in November 2004 of the regional radio business of Daily Mail and General Trust, and the entire radio business of RG Capital Radio Pty Limited. Excluding those licences held with other companies in a joint venture, it controlled 34.87 per cent of all licences. Taking into account the licences it controlled in a joint venture with another company, the figure for all licences increased to 37.93 per cent. Some licences controlled by Macquarie Bank Limited were the subject of an approval under section 67 of the Broadcasting Services Act, as they were held in breach of the two to a market rule in section 54 of the Act. Once sold, Macquarie Bank Limited would be in a position to exercise control of approximately 34 per cent of all the commercial radio broadcasting licences in Australia.

The proportion of people in a position to exercise control of one or two AM licences only was 24 per cent of the AM licences on issue in the broadcasting services bands. Only 16.13 per cent of FM licences were controlled by people who control only one or two FM

licences. The proportion of people controlling one or two licences only (AM or FM or both) was 15.21 per cent.

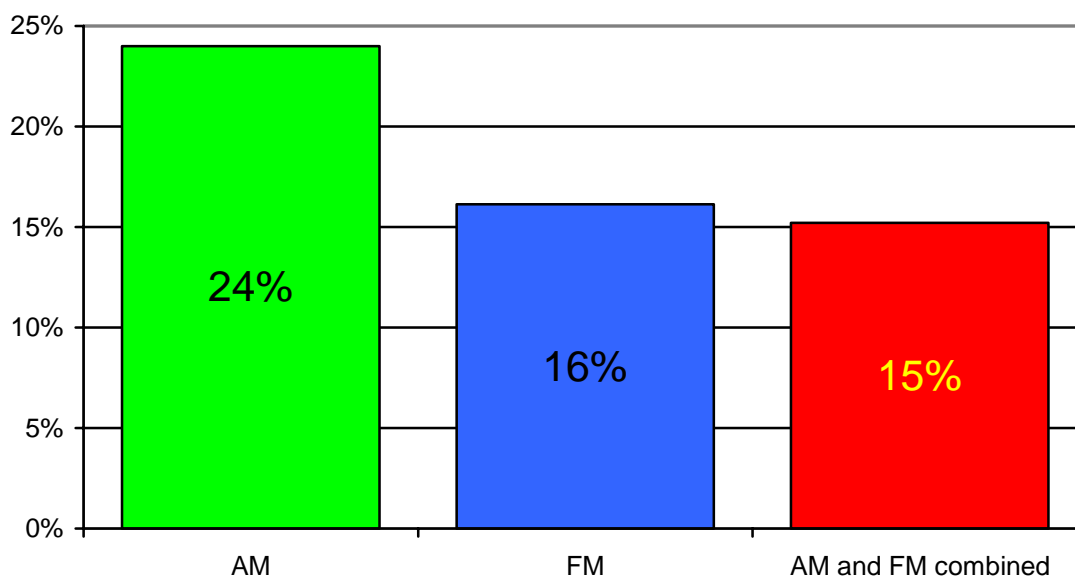


Figure 8 – Proportion of people in a position to exercise control of only one or two licences (by market segment)

The columns in Figure 8 did not account for the possibility that the people may also hold other licences. People who control one or two AM licences may also control FM licences, and vice versa.

Figure 9 takes account of this possibility. It shows that eight people were in a position to exercise control of one or two AM licences and did not also control FM licences in any area. These eight people held 12 licences between them. Of these 12 AM licences, eight were used for racing radio purposes by five companies, and the performance of these services was arguably incidental to the performance of the overall business. The remaining four AM licences were controlled by three companies. One of these companies controlled two strongly performing AM licences in the Sydney licence area. Another AM licence was controlled in a joint venture by parties who also individually controlled other commercial radio broadcasting licences (each partner to the joint venture also controlled one other AM and one other FM licence).

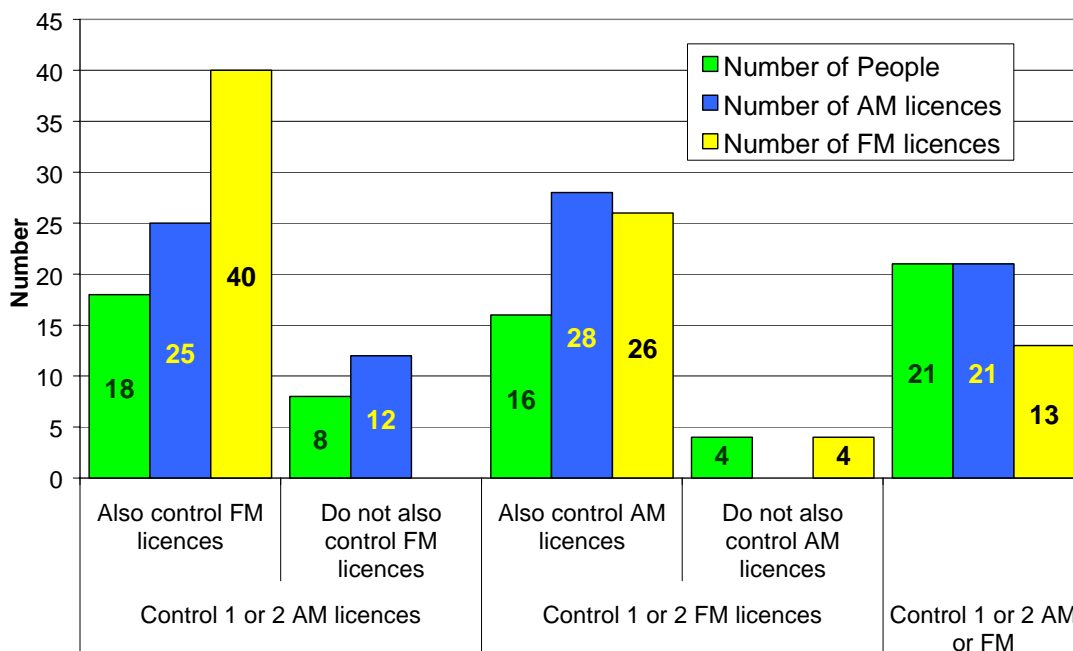


Figure 9 – Comparison of people controlling one or two licences only (by market segment)

Competition among commercial radio broadcasting licences in the same area

Commercial radio broadcasting licences are licensed to serve particular areas of Australia. An analysis of the competition position of commercial radio licences in each area before the purchase by Macquarie Bank Limited (which resulted in a market distortion away from competition) shows that the majority of areas were organised so that the available commercial radio broadcasting licences in an area were controlled by only one person: 133 of the 261 licences were in this category. Seventy-five licences were in areas where the available commercial radio broadcasting licences were controlled by two people, and areas where three or more people controlled the available licences accounted for 53 licences.

If the effect on competition of the existence of national, community and narrowcasting radio services in each area is ignored, 50.96 per cent of the available commercial radio licences were held by a monopoly and 79.63 per cent of licences were held in either a monopoly or duopoly arrangement.

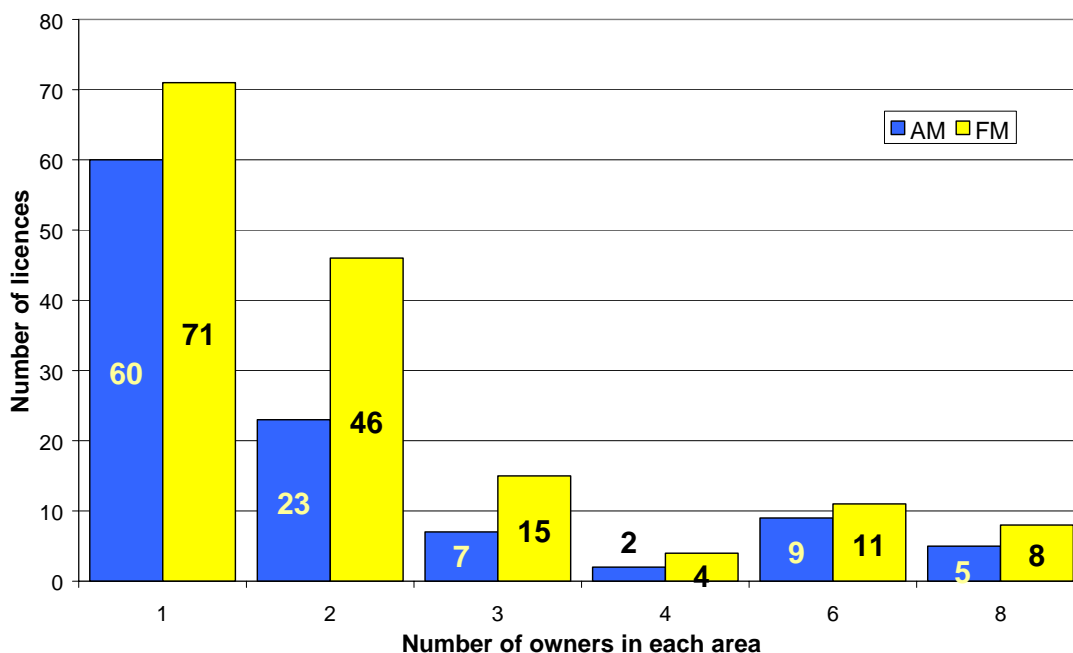


Figure 10 – Extent of competition in the commercial radio market grouped by the number of AM and FM licences

Figure 10 shows that the majority of licences were in areas where there were one or two owners. These are the regional licence areas, which characteristically have fewer people than metropolitan areas (and are also geographically small). There are therefore more areas and more licences in regional Australia than in metropolitan Australia.

In each metropolitan area, there were at least three distinct owners of the available commercial radio broadcasting licensees. In Adelaide, there were three owners, there were four in Perth, six in Brisbane and Melbourne, and eight in Sydney. However, there were also regional areas where there were three owners in the area: Cairns, Mackay, Gold Coast (including Murwillumbah), and Shepparton (including Deniliquin).

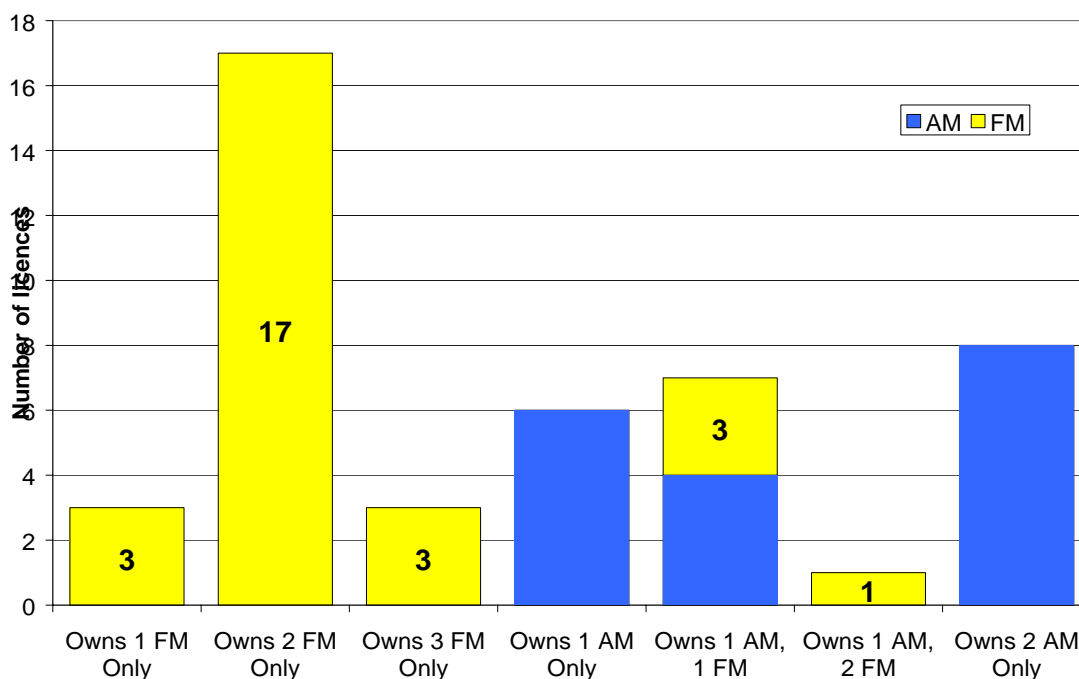


Figure 11 – Ownership structure and competition of commercial radio in metropolitan licence areas

Figure 11 shows how AM and FM licensees compete in metropolitan areas. For example,

- there were three FM licensees who were competing in a metropolitan licence area who did not hold any other licences in that area (AM or FM) and
- there were 14 AM licensees who are competing in a metropolitan licence area who did not hold any other licences in that area (AM or FM).

Figure 11 also shows that, in any given metropolitan area, it is more likely that a person will own either AM or FM (not both). Thirty-seven of the 45 metropolitan licences (82.22 per cent) were held by a person who did not also hold a licence of the other type in that area.

Figure 11 also discloses two anomalous situations in relation to Sydney²³ and Brisbane²⁴ where it might appear that there was a person in control of more than two licences in an area (which would seem to be a breach of the two to a market control rule).

²³ In Sydney, one person owned more than two FM licences in the one area (three FM licences in the greater Sydney area). This case is anomalous because there are three separate licence areas which substantially overlap, permitting the licensee to own one licence in each of the areas and not breach the 'two to a market' rule. The three licence areas are Sydney RA1, Western Sydney RA1 and Katoomba RA1. The other area in which an overlap has been counted is the Ipswich RA1 licence area, which has a similar size overlap with Brisbane RA1 as the overlaps in the Sydney area. However, this does not result in anomalous ownership figures because there is only one overlap.

²⁴ In Brisbane, one person owned one AM and also two FM (due to a joint-venture arrangement in relation to an FM licence). One party to the joint-venture controlled an AM licence while the other controlled an FM licence. Each of the parties to the joint-venture therefore only controlled two licences, but the joint-venture itself was 'connected' to three licences. This results in the figure for 'Owns No AM/Owns 2 FM' and the total for 'Owns 1 AM/Owns 1 FM' being odd numbers. The entry '1' in the 'Owns 1 AM/Owns 2 FM' category could be counted in either of these columns.

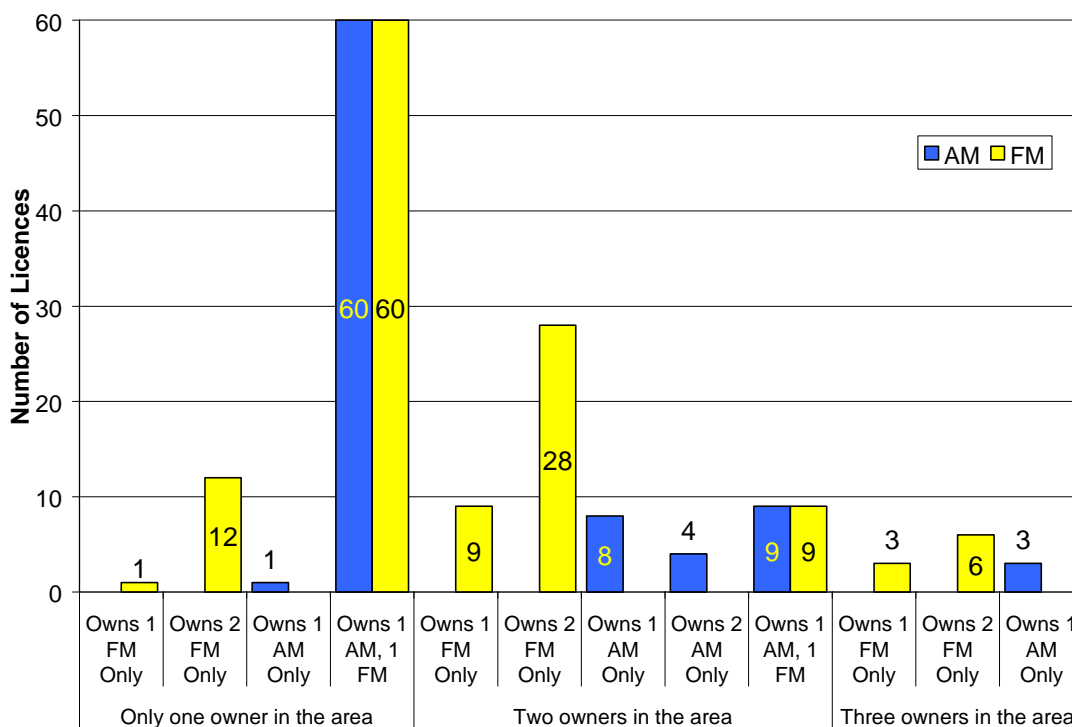


Figure 12 – Ownership structure and competition of commercial radio in regional licence areas (excluding services carrying racing radio formats)

Figure 12 groups the regional licence areas into broad categories based on the competitive arrangement existing in the licence area before the purchase of commercial radio broadcasting licences by Macquarie Bank Limited, and excluding services carrying racing radio formats.²⁵ The main grouping relates to the number of owners in the area (one, two or three). The second grouping within the main grouping relates to the number and type of commercial radio broadcasting licences owned by the people who are in that category. For example, when there was only one owner in the area, there were 13 FM licences owned by people who did not own any AM licences in the same area. These 13 licences are in the left two columns of Figure 12.

There are 92 regional markets in which licence areas that overlap more than 30 per cent are included as one market. Of these, and excluding racing radio services from the analysis,²⁶ 68 markets had only one owner (monopoly markets), 21 markets had two owners (duopoly markets), and three had three owners. There were 213 licences spread across these market types.

It is in regional areas where monopoly and duopoly arrangements are most pronounced. There were 201 licences (94.37 per cent) in regional areas that were held by a monopoly or duopoly. Of the 68 monopoly markets, there were 60 markets in which the owner

²⁵ There were three racing radio services in regional markets, all AM services, in Launceston (Tasmania), Maryborough (Queensland) and Shepparton (Victoria).

²⁶ Excluding racing radio services from the analysis changes the number of owners in the Launceston, Maryborough and Shepparton (including Deniliquin) markets. The number of owners in these areas decreases by one in each area, from two in Launceston, two in Maryborough and three in Shepparton (including Deniliquin).

owned one AM and one FM licence. This is largely due to the allocation of an additional, FM, licence to AM licensees in one-station markets, under section 39 of the Broadcasting Services Act.

Further, there were only 12 licences in areas where there are three owners in the area (Cairns, the Gold Coast (including Murwillumbah) and Mackay, with four licences in each). The licences in the Cairns and Mackay areas have been purchased by Macquarie Bank Limited, and at the date of this report, it is therefore likely that when some are sold to ensure Macquarie Bank Limited no longer holds more than two in each area, there will no longer be three owners, but two.

Only a small number of people had AM licences only in a competitive market (with two or three owners). Figure 12 shows that only 15 AM licences (7.04 per cent of all regional licences) were held in competitive markets where the owner did not also own some FM licences. Conversely, there were 46 FM licences held by an owner who did not also own some AM licences in that market.

More people in competitive areas were in a position to control either AM or FM licences than in a position to control both (the reverse of the situation in monopoly markets). The percentage of AM licences that were owned together with FM licences in competitive regional areas was 22.78 per cent, whereas 89.55 per cent of AM and FM licences were held in this way in monopoly areas.

There were 16 AM licences held in markets where the owner did not also hold an FM licence. Fifteen of these were in the competitive markets of: Canberra (two licences) (Australian Capital Territory); Coffs Harbour, Kempsey and Orange (New South Wales); Ballarat, Bendigo, Mildura and Shepparton (including Deniliquin) (Victoria); Cairns, the Gold Coast (including Murwillumbah), Mackay, and Toowoomba/Warwick (two licences) (Queensland); and Bunbury (Western Australia). The remaining licence was in the non-competitive Launceston market.

Metropolitan AM

The 18 AM commercial radio licences in metropolitan Australia were controlled by 10 companies (Figure 13). Southern Cross Broadcasting (Australia) Limited controlled six of these, or one third of all metropolitan AM licences, but did not control any regional AM service. It also controlled only one FM commercial radio broadcasting licence, the 6NOW commercial radio broadcasting service in Perth.

Six companies controlled only one metropolitan AM licence. The four companies that controlled more than one metropolitan AM licence were in a position to exercise control of 12 metropolitan AM licences, or 66 per cent of the metropolitan AM licences.

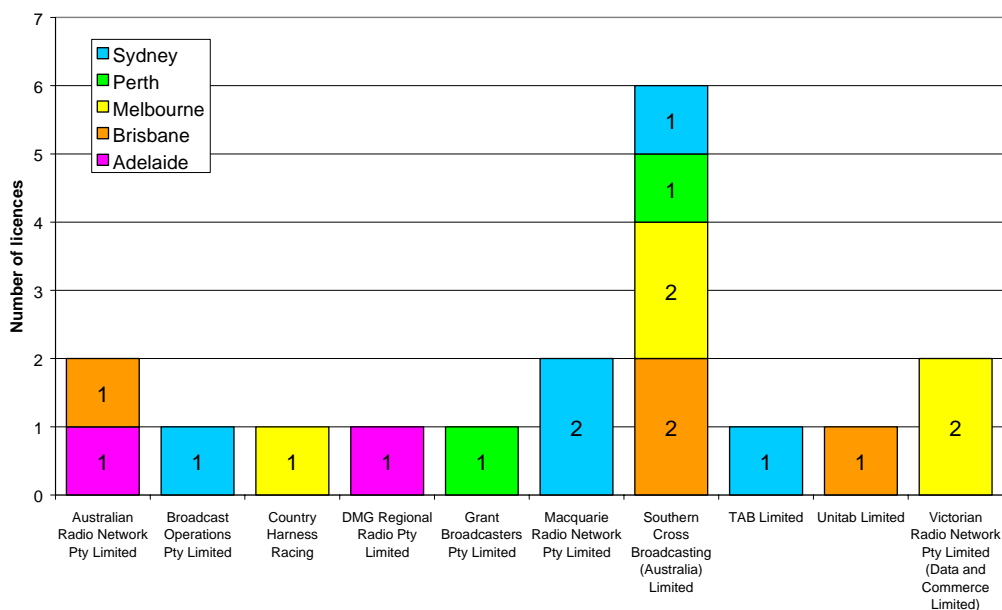


Figure 13 – Control of AM commercial radio broadcasting licences using the broadcasting services bands in metropolitan areas

Regional AM

The largest controller of regional AM commercial radio broadcasting licences that use the broadcasting services bands was Macquarie Bank Limited (see Figure 14), which was in a position to exercise control either directly, or through a controlled subsidiary, AMI Radio Pty Limited of 36 licences, or 40 per cent of regional AM licences.

A number of the broadcasters with the most commercial radio licences have also entered into joint venture agreements with other broadcasters to share control of a number of commercial radio licences. In most cases, the joint venture arrangements related to regional licences in the FM bands,²⁷ however Figure 14 shows that one joint venture related to licences in the AM bands.²⁸

²⁷ The following companies were in joint venture arrangements in relation to FM licences:

- Macquarie Bank Ltd and Goulburn Valley Broadcasters Pty Ltd, two licences, one in Albury and two in Shepparton
- Capital Radio Network Pty Ltd and Grant Broadcasters Pty Ltd, one licence in Canberra
- Austereo Pty Ltd and Macquarie Bank Ltd, two licences in Newcastle
- Austereo Pty Ltd and Australian Radio Network Pty Ltd, two licences in Canberra and
- DMG Radio Investments Pty Ltd and Australian Radio Network Pty Ltd, two licences, one in each of Brisbane and Perth, although these are metropolitan licence areas.

²⁸ Capital Radio Network Pty Limited and Grant Broadcasters Pty Limited entered into an arrangement in relation to three AM commercial radio broadcasting licences: two in Canberra and one in Goulburn.

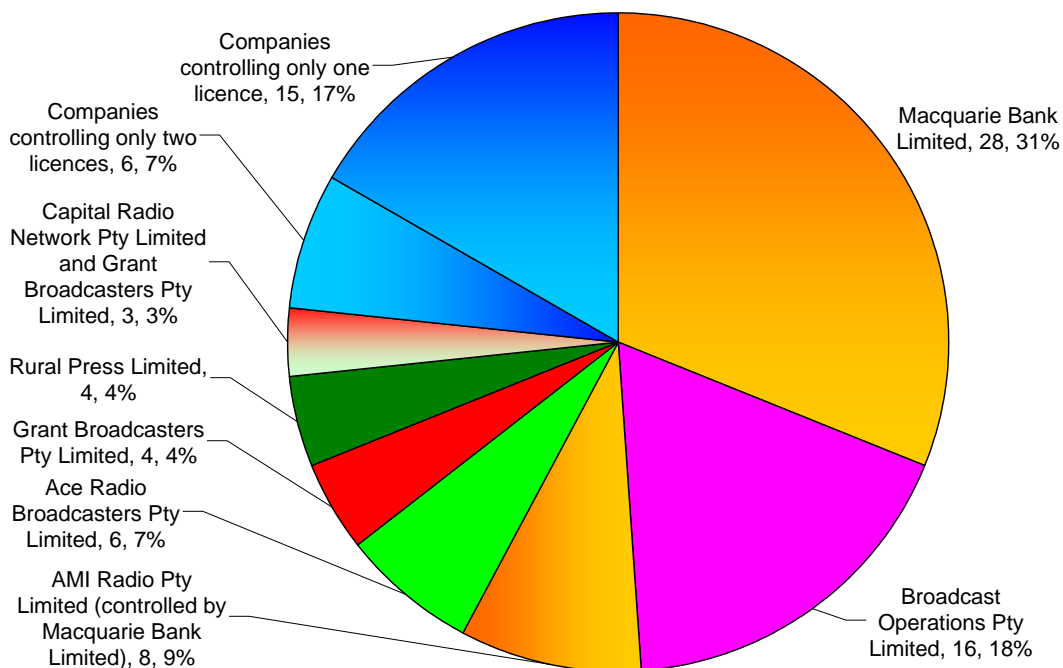


Figure 14 – Concentration of control of AM commercial radio broadcasting licences using the broadcasting services bands in regional Australia (Controlling company, number of AM licences controlled, percentage of all AM licences controlled)

There have been suggestions that ACMA review its long-standing policy that it will not plan for the conversion of AM commercial services to FM but will meet any requests for conversion by allocating additional FM licences to the highest bidder. The ABA provided an exception to this policy in Launceston, a small radio market that was unique in having no commercial FM radio services. It converted both existing AM commercial radio services to FM. The ABA received submissions inviting it to consider whether the situation in Launceston warranted the widening of the exception to extend to AM services in other regional markets.

There are broader sensitivities around the policy for conversion of AM services to FM in regional markets. Some operators in metropolitan markets view the creation of an exception to the policy against conversion in regional markets as establishing a precedent for the conversion of AM services in metropolitan markets. However, the availability of FM spectrum in metropolitan areas is limited, and conversion of existing AM services would require fundamental changes to the policy settings that are unlikely to be acceptable. These changes include reducing the protection threshold for existing FM services, thereby reducing their service quality and coverage. It is unlikely that audiences would appreciate the diminution of existing services for the conversion of already existing services to FM.

Trends in the sales of AM services

An argument suggested for exempting AM services from the current ‘two to a market’ rule is that AM radio services are not as attractive an asset as FM radio services.

ACMA maintains a register, under section 75 of the Broadcasting Services Act, of notifications of changes in control of commercial broadcasting services. ACMA examined the register to identify trends in relation these notifications in relation to AM radio services since 1992. As full year records do not exist for 1993, the analysis covers the years 1994 to 2004. The register records the reasons for the notification, and these have been split into four categories of ‘notifiable event’: full sale; part sale; receivership; and restructure. Three AM licences were allocated by the ABA during the period, increasing the number of AM licences in Australia from 105 in 1992 to 108 in 2004: the allocation of these licences has been ignored for the purpose of this analysis.

A full sale is defined as a notifiable control event for which all registered controllers are relinquishing control of the licence and the reason given is other than as a result of the licensee going into receivership or liquidation. A part sale is defined as a notifiable control event for which additional people will be entered into the register as controllers of the licence and the reason given is other than as a result of restructure. A part sale represents an opportunity for the owners of an AM commercial radio licence to seek additional capital from interested investors.

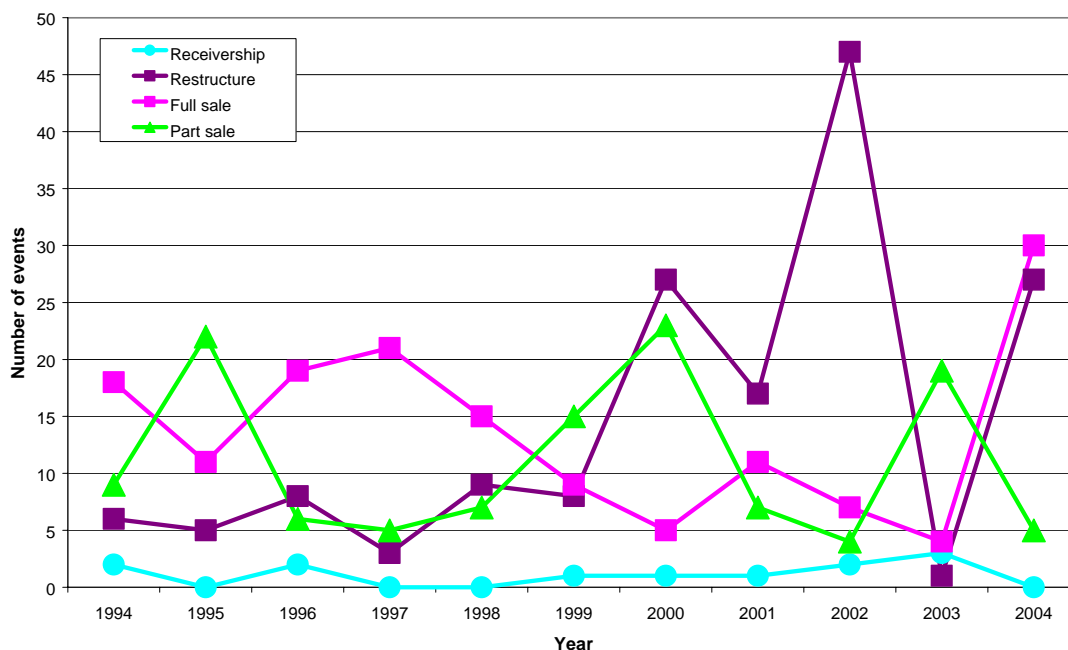


Figure 15 – Sales events by category over time

The number of part sales of AM commercial radio licences has not changed significantly over time. The number of full sales has marginally declined, from an average of around 15.5 between 1994 and 1999, to an average of around 13 between 1999 and 2004.

The large number of restructure events that took place in 2000, 2002 and 2004 can be attributed to significant restructure transactions involving the Daily Mail and General Trust group of companies, which held a large number of AM licences.

- Of the 27 AM licences that were the subject of restructure in 2000, 23 were restructured in an internal restructure of the Daily Mail and General Trust group in a transaction on 30 September 2000.
- Of the AM 47 licences that were the subject of restructure in 2002, 20 were restructured in a transaction on 1 July 2002 when Daily Mail and General Holdings Limited transferred its control of the licences to Daily Mail International Limited, and 22 were restructured in a transaction on 25 September 2002, when Daily Mail International Limited transferred its control of the licences to DMG Radio Holdings Pty Limited.
- Of the 25 AM licences that were the subject of restructure in 2004, 21 were restructured in a transaction on 31 March 2004 in which shares held by Hobsons plc and Leicester Mercury Group Limited were transferred to Daily Mail and General Holdings Limited.

The number of AM commercial radio services in receivership or liquidation between 1994 and 2004 did not vary markedly, averaging around one per year. This is not a significant number of licences to be in liquidation or receivership from a sample of between 105 and 108 licences, and, over the period, would tend to indicate a reasonably healthy industry, albeit not always profitable.

Of the 108 AM licences that could be traded between 1994 and 2004, 88 (81.48 per cent) of these have been the subject of a full or part sale at least once. Sixty-nine (63.89 per cent) AM licences have been sold or partially sold at least twice over the same period. In the period between 1999 and 2004, 71 (65.74 per cent) AM licences were sold or partially sold at least once, and 40 (37.04 per cent) were sold or partially sold more than once. The similarities in the period 1999 to 2004 to the period 1994 to 2004 can be attributed to the sale of 28 AM licences and 63 FM licences in regional Australia to Macquarie Bank Limited in November 2004. The sale of 28 AM licences in a single year represents 25.93 per cent of the entire AM radio market sold in one ‘bundle’ of transactions.²⁹

²⁹ While there were two transactions involved (the sale by Daily Mail and General Trust and the sale by RG Capital Radio Pty Limited) in both of these transactions the purchaser was Macquarie Bank Limited.

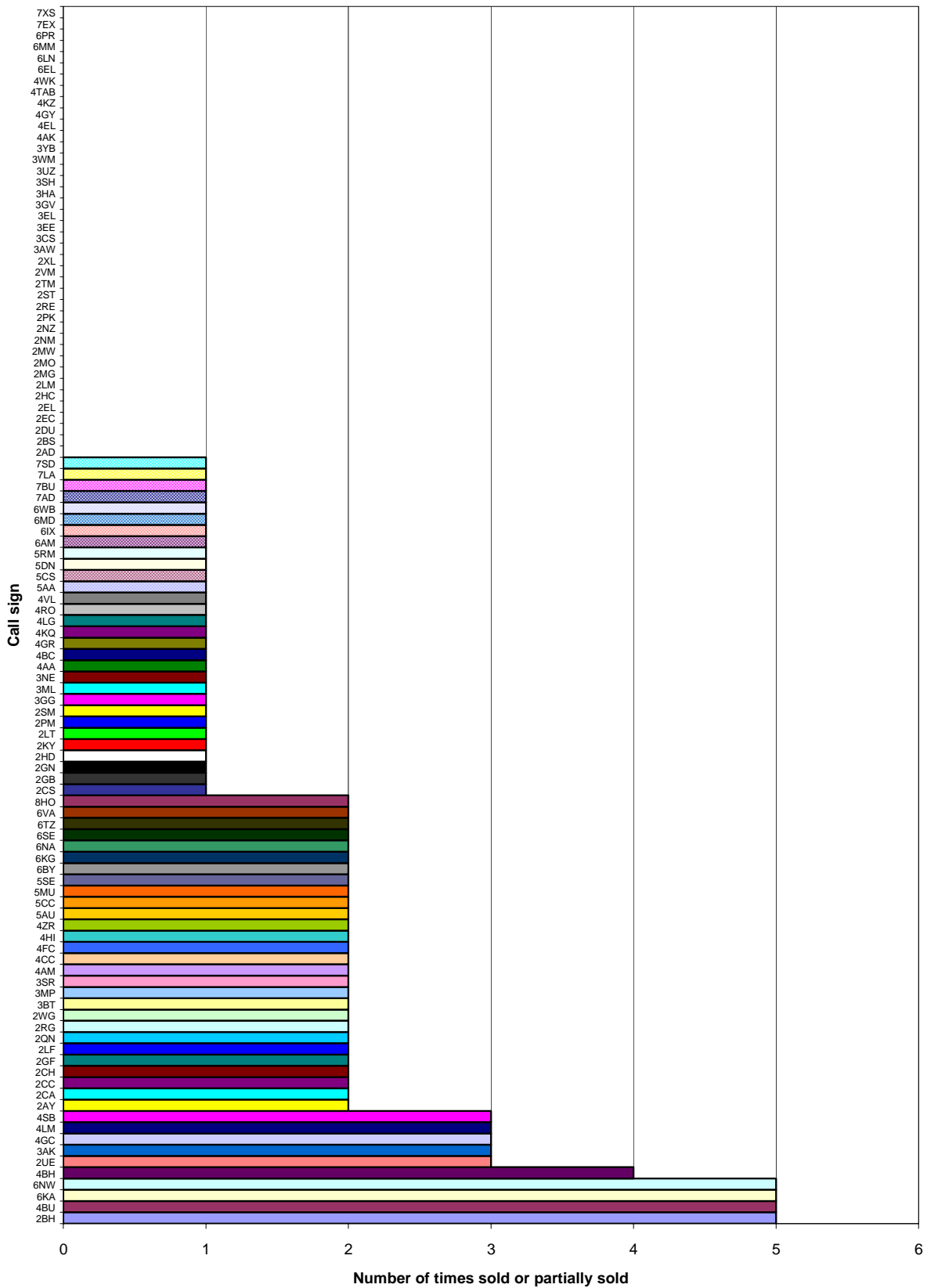


Figure 16 – AM licences sold or partially sold in the period from 1999 to 2004

Figure 16 shows the AM licences traded in the period between 1999 and 2004.

As more than three-fifths of the available AM licences have been sold or partially sold in the last five years, it would seem that there is still capital interested in investment in AM despite the technical, audience and profitability issues associated with it.

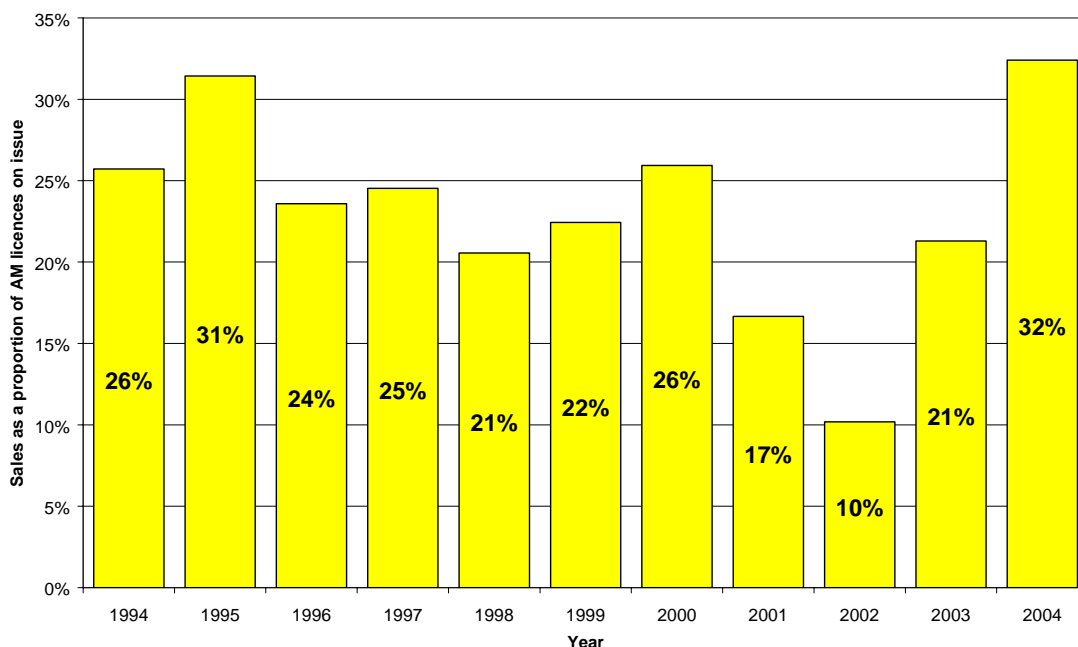


Figure 17 – Full and part sales (AM only or combined AM and FM) as a percentage of AM licences on issue

The percentage of all sales (full sales and part sales) that included an AM service as part of the sale has not significantly changed over time. With the exception of 2001 and 2002, more than 20 per cent of all AM licences per annum were involved in a sale transaction. This would seem to suggest that there is a steady market of AM licences available for purchase, which is met by the availability of capital. There is a perception in the market however, that over the past eight years sales of commercial radio licences, both AM and FM, have generally been instigated by those wishing to off-load underperforming services.³⁰ This would tend to suggest that capital investment over the period to 2004 in AM services is at the lower end of the value of AM radio as a whole.

There are a few notable exceptions however, with the sale in 2001 of the high rating AM service 2UE in Sydney to Southern Cross Broadcasting (Australia) Limited being the most prominent. The 2UE service has also been the subject of two other sales or part sales over the period 1999 to 2004, as shown in Figure 16.

Another notable example from Figure 16 are the four sales or part sales of the reasonably high rating 4BH Brisbane AM service. Also, the sale of 28 AM licences to Macquarie Bank Limited in November 2004 was arguably not instigated by operators wishing to offload underperforming services. Rather, these two transactions represent the exit from

³⁰ Bob Peters, Global Media Analysis, 30 August 2004, personal communication. This is excluding the commercial licences allocated by the ABA through the price-based allocation process.

the entire radio market of one company, RG Capital Radio Pty Limited, and the exit from the regional radio market of another company, Daily Mail and General Trust. The transactions included both AM and FM commercial radio licences.

The steady market for AM licences over the period in question, with some high performing stations sold, suggests that the AM sector is not in terminal decline.

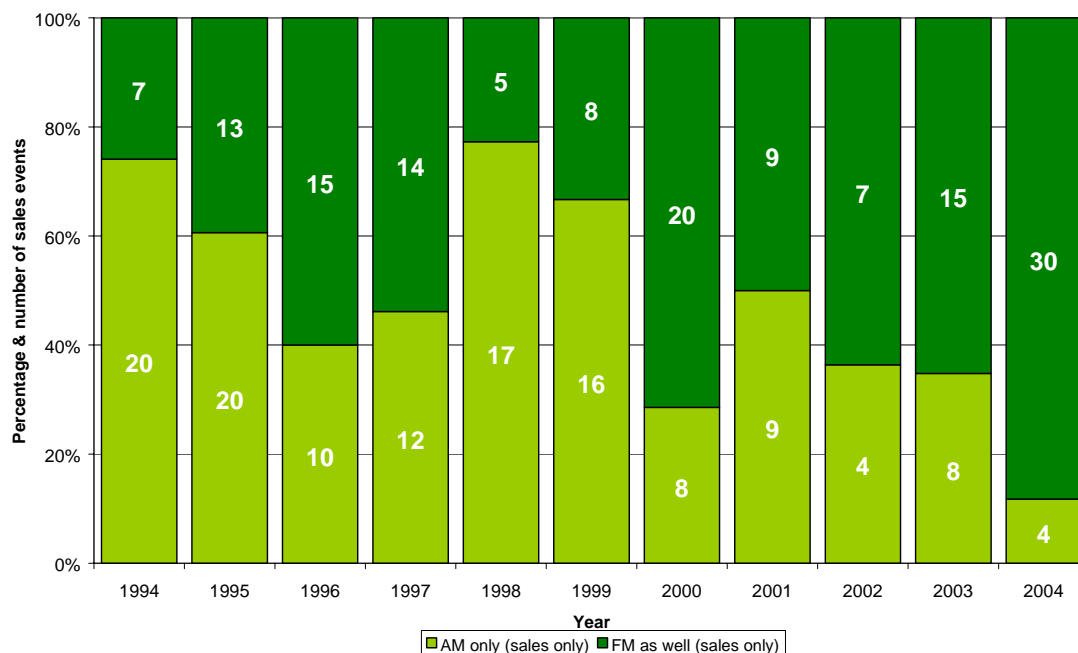


Figure 18 – Number of AM sales (AM only and AM and FM combined)

An analysis of the types of licences traded as part of a sale indicates that there are a significant proportion of sales where only AM licences are traded. This would seem to suggest that there is capital available to invest in AM licences, even though it may generally be at the lower end of the potential value of a ‘generic’ AM service.

While it is generally true to say that AM services are valued by the market at a discount to FM services, there are also exceptions. For example, analysts suggest that the highest rating AM service in a metropolitan area may attract a higher sale price than the lowest rating FM service in the same area.³¹

FINANCIAL PERFORMANCE

In 2002–03, the AM sector of the radio industry generated \$228.9 million in revenue, of a total of \$774.2 million generated by the entire radio industry. The sector made a profit of \$8.9 million, of a profit of \$106.2 million for the entire radio industry. The AM sector’s increase in revenue was 2.4 per cent, while the increase in overall revenue for the entire industry was six per cent. Although the radio industry reported a slight decline of 2.1 per cent on the previous year’s profit of \$110.1 million, the AM sector reported a significant

³¹ Mr Peters, Global Media Analysis, 30 August 2004, personal communication.

improvement in profit performance. In 2002–03, the AM sector recorded a profit of 8.9 million, in marked contrast to the previous year's loss of 1 million.

The figures in Table 1 show the total advertising received and the profit before interest and tax of all radio licences in 2002–03, while Table 2 shows the number of profitable and unprofitable licences in 2002–03.

Table 1 – 2002–03 AM and FM radio services performance: Revenue and profit before interest and tax

AM/FM service location	Number of stations	% of all stations	Total advertising revenue (2002-03)		Profit before interest and tax (2002-03)	
			\$M	%	\$M	%
Metropolitan AM	18	7.09	136.5	19.23	14.8	11.76
Metropolitan FM	26	10.24	350.0	49.30	55.7	44.24
Regional AM	90	35.43	66.1	9.31	3.9	3.10
Regional FM	120	47.24	157.3	22.16	51.5	40.91
Total	254	100	709.9	100.00	125.9	100.00

Table 2 – Profitability of AM and FM radio services in 2002–03

AM/FM service location	Number of stations	Number of profitable stations (% within location)	Number of unprofitable stations (% within location)
Metropolitan AM	18	12 (66.7%)	6 (33.3%)
Metropolitan FM	26	19 (73.1%)	7 (26.9%)
Regional AM	90	57 (63.3%)	33 (36.7%)
Regional FM	120	99 (82.5%)	21 (17.5%)
Total	254	187 (73.6%)	67 (26.4%)

Advertising revenue and profitability are only two indicators of the health of the AM commercial radio industry. Other useful indicators include return on investment and the share price movements of companies holding AM licences. However, share price movements are not available in relation to companies that are privately owned and it is difficult to establish accurate figures for return on investment in relation to companies that also control other media assets.

Profitability

Twenty-six metropolitan FM stations accounted for the majority (44.2 per cent) of profit before interest and tax (PBIT) generated by the commercial radio industry. The 120 regional FM stations were the next largest contributor to industry profits, accounting for 40.9 per cent of PBIT in 2002–03. This means that the FM band across both the metropolitan and regional markets accounted for approximately 85 per cent of industry PBIT in 2002–03. Eighteen metropolitan AM stations accounted for 11.8 per cent of the radio industry's PBIT, with 90 regional AM stations accounting for the remaining 3.1 per cent. Figure 19 shows that the performance of regional AM services was poorest of the

radio industry: 35.4 per cent of all licences accounted for just 3.1 per cent of the profit earned by the industry. Metropolitan AM services performed slightly better than average, but best performing sector was clearly metropolitan FM: 10.2 per cent of licences accounted for 44.24 per cent of the entire industry’s profit.

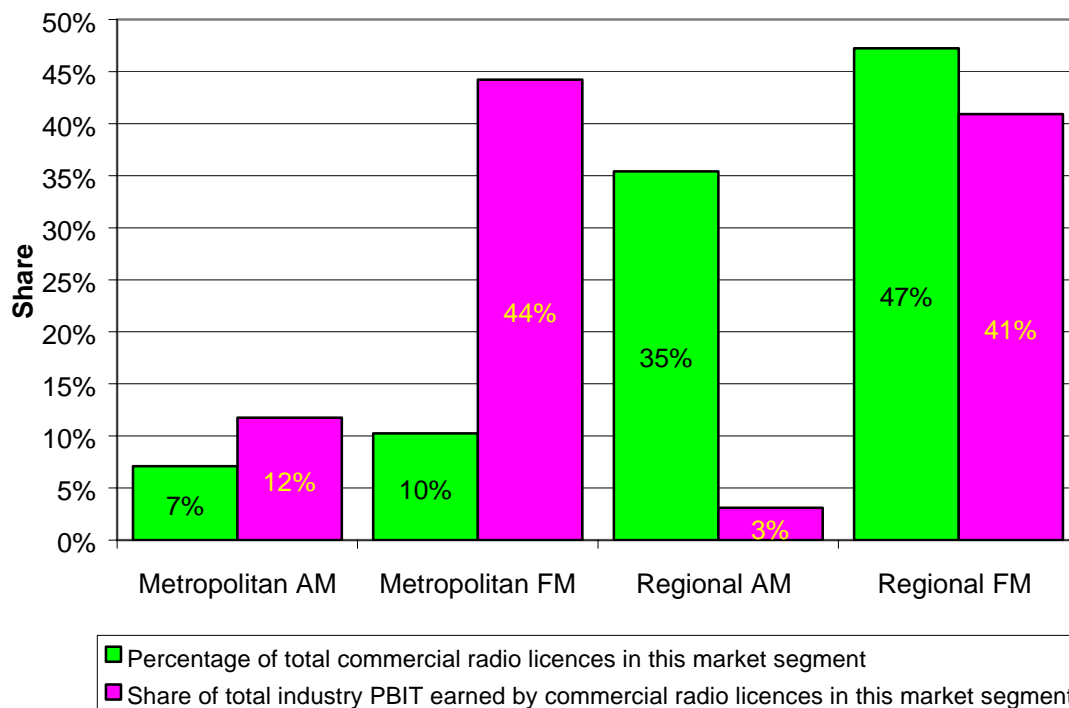


Figure 19 – Share of 2002–03 radio industry profit compared with proportion of licences in that market segment

In 2002–03, regional FM services were most likely to be profitable: 82.5 per cent were profitable. In comparison, regional AM services were least likely to be profitable, with 36.7 per cent of services reporting as unprofitable.

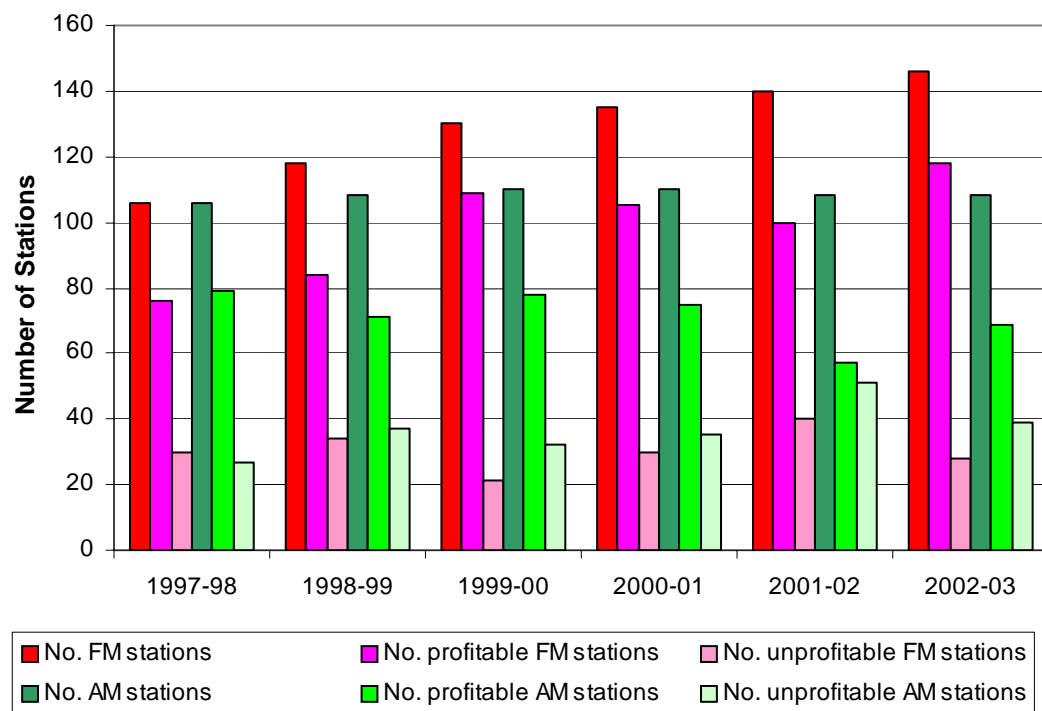


Figure 20 – Number of profitable FM and AM radio stations, 1997–98 to 2002–03

Advertising revenue

The sale of advertising is the largest single source of revenue for the commercial radio industry, accounting for 91.8 per cent of total service revenue (a total of \$709.9 million in 2002–03). FM accounts for the majority of this (71.5 per cent), with the metropolitan stations attracting 49.3 per cent and the regional services attracting 22.2 per cent. Of AM radio's 28.5 per cent, 19.2 per cent went to the metropolitan AM services, with the remaining 9.3 per cent going to the regional AM services.

Given that 42.5 per cent of the commercial radio licences were AM licences, the disproportionate advertising revenue share obtained by FM services indicates the relative strength of the FM market generally. However, the share of revenue obtained by metropolitan AM licences compared with other segments of the radio industry was nevertheless high: metropolitan AM licences accounted for 7.1 per cent of the radio industry, but accounted for 19.23 per cent of advertising revenue.

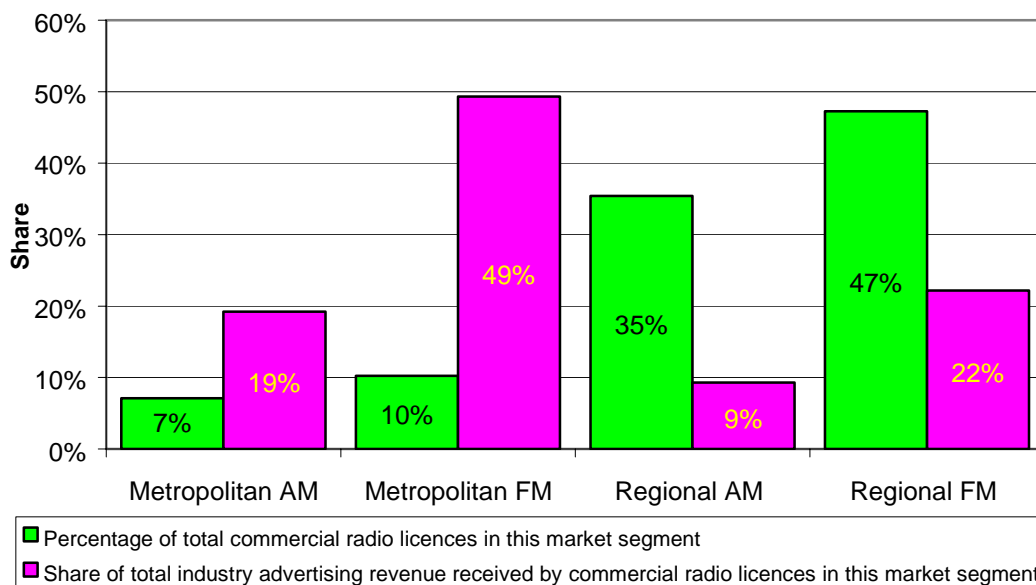


Figure 21 – Share of 2002–03 radio industry advertising revenue compared with proportion of licences in that market segment

In line with the trends noted earlier, metropolitan radio stations attracted the higher proportion of advertisers. Metropolitan FM and AM station revenues from the sale of airtime have been divided around the 70/30 level since the late 1990s. In the 2002–03 year, metropolitan FM stations accounted for 71 per cent of metropolitan advertising revenue, which represented a small decline of two per cent in comparison to the previous year. The same trend was evident in the regional markets, where FM attracted 70.2 per cent of total revenue in all regional markets from the sale of air time, with regional AM accounting for the remaining 29.8 per cent.

Given that approximately 60 per cent of the licences were FM, the flow of about 70 per cent of the advertising revenue to FM services was marginally better than the average, highlighting the comparative value of FM to advertisers over AM services.

Competitive factors affecting the financial performance of AM and FM services

The competitive arrangements in different markets may have some bearing on the financial performance of commercial radio broadcasting services. This section analyses the performance of AM services in individual markets taking account of the ownership structures in place in that market.

AM racing radio services

In the main, the financial analysis in this section of the competitive performance of AM commercial radio broadcasting services excludes the financial performance of racing radio services. This is because the format of racing radio services is so different to that of other commercial radio formats that in many cases, the competition is negligible. Further, the business model of racing radio is also different from that of other commercial radio

services. Racing radio services form part of a larger enterprise, where the financial performance of the broadcasting service is not crucial to the main operation of the business as a whole. Including racing radio financial details in an analysis of the competitive arrangements in regional Australia would therefore have a distorting effect.

However, for completeness, the financial performance of racing radio services is detailed in Figure 22.

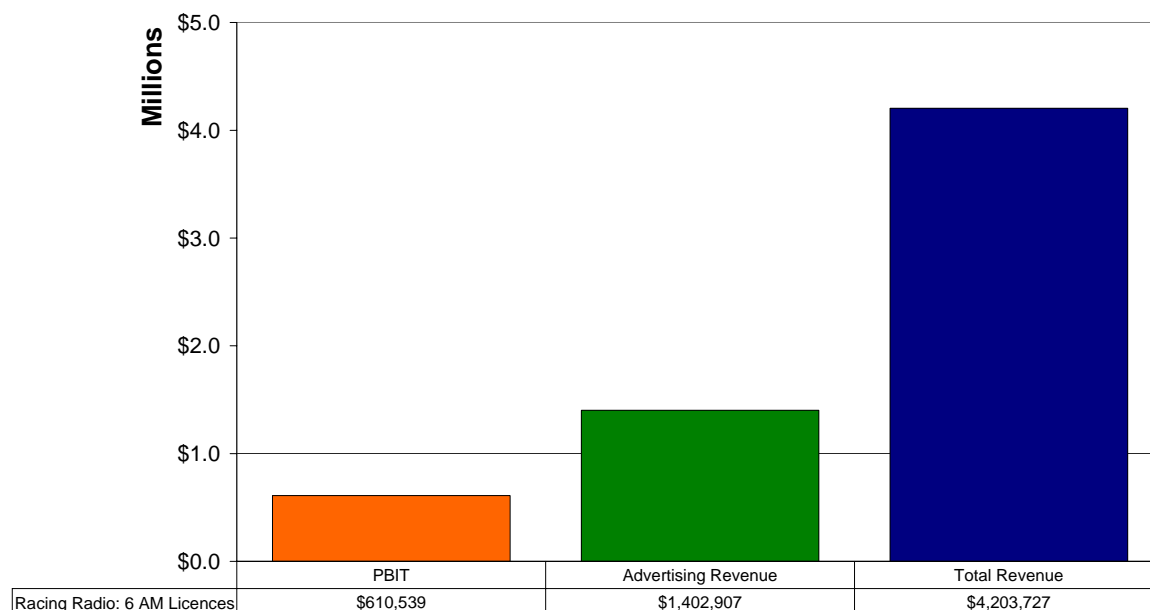


Figure 22 – Financial performance of AM commercial radio broadcasting services with the racing radio format

Figure 22 shows a large differential between advertising revenue and total revenue for racing radio services. This differential can be attributed to the revenue gained from the networking of racing radio services to narrowcasting services in regional Australia, and the relative non-importance of advertising revenue to the racing radio business model. This highlights the difference between racing radio and other commercial radio broadcasting services: advertising revenue represents approximately 93 per cent of total revenue for non-racing radio services, and 33 per cent for racing radio services.

Confidentiality prevents the extraction of data in Figure 22 to distinguish between regional and metropolitan racing radio services because data cannot be extracted if the total revenue of two services in a category adds to more than 85 per cent of the total for that category. This is the case for regional racing radio services.

Regional AM commercial radio broadcasting services (excluding racing radio)

Figure 12 has been used as the basis for analysing the financial performance of AM and FM services in different competitive environments across competitive regional markets. Confidentiality prevents the extraction of data for licences where fewer than three licences exist in the category. Therefore, it has not been possible to extract data for areas in which:

- a person owned one AM only in a monopoly market
- a person owned one FM only in a monopoly market and
- a person owned two AM only in a competitive market.

This is because only one licence was in the former categories, and there were only two owners in the latter category.³²

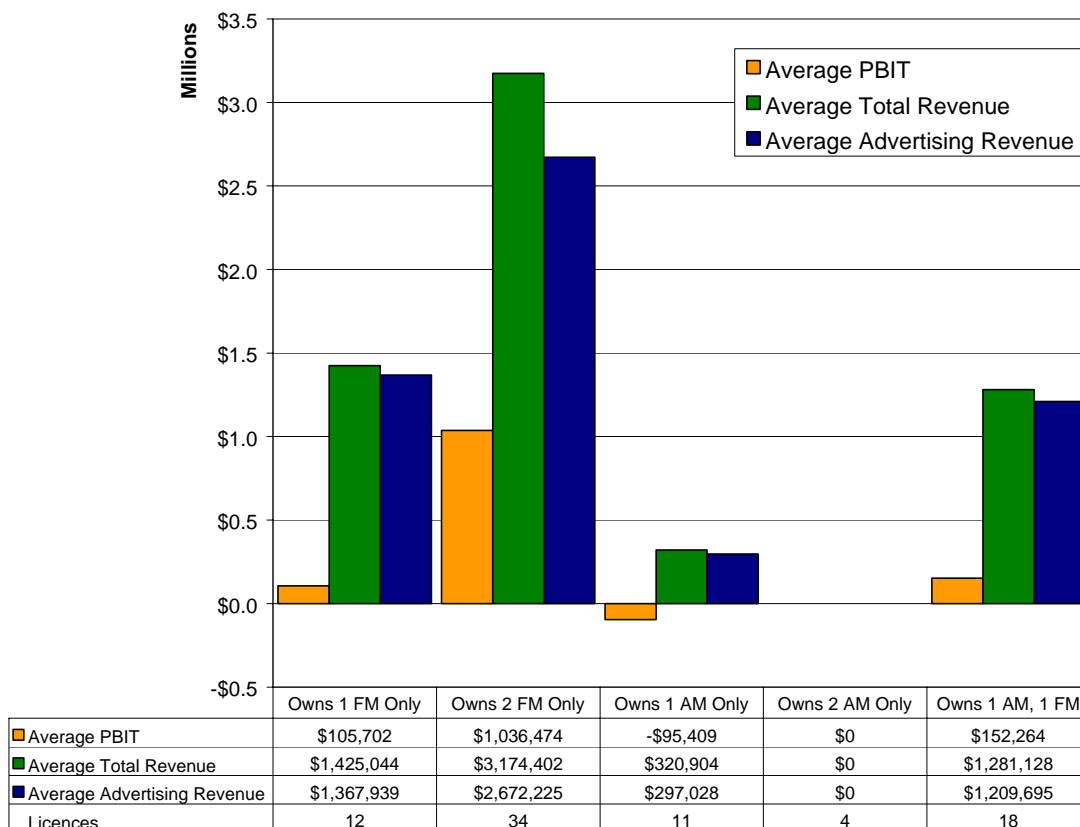


Figure 23 – Financial performance of all competitive markets (grouped by licences owned in the market)

Figure 23 shows that the highest profitability was recorded in those competitive markets where the owner owned two FM licences only and competed against AM and FM services in that market. These licences also received the highest total revenue and advertising revenue. These are the areas of Canberra in the Australian Capital Territory; Coffs Harbour, Gosford, Kempsey, Newcastle and Orange (New South Wales); Ballarat, Bendigo, Mildura and Shepparton (Victoria); Cairns, Gold Coast, Mackay, Nambour and Townsville (Queensland); and Hobart (Tasmania), which are larger regional areas.

³² There were only two AM licences in the Launceston RA1 licence area, each of which is owned by a different person. One of these was a racing radio service, and was therefore excluded from this analysis, making the Launceston RA1 licence area a monopoly market. In the case of owners holding two AM licences only in a competitive market, this occurred in the Canberra RA1 and Toowoomba/Warwick RA1 licence areas. While there were four licences in this category, disclosure of the details would enable the owner in one market to work out the details of the licences in the other.

The second most profitable category is licences in competitive markets where the owner owns one AM and one FM. A licence in this category averaged a profit of around \$150,000, with advertising revenue of \$1,200,000.

The third most profitable category is for those who own one FM licence only in that market. These are the areas of Albury, Dubbo, Gosford, Moree, Wollongong (two licences) (New South Wales); Bundaberg, Cairns, Gold Coast (including Murwillumbah), Mackay and Nambour (Queensland); and Hobart (Tasmania). Most of these markets are larger regional areas.

The services which record the smallest reportable revenues are those whose owner owned one AM licence only. The average advertising revenue for these licences was around \$300,000. These licences are in the areas of Coffs Harbour, Kempsey, Orange, (New South Wales); Ballarat, Bendigo, Mildura, Shepparton (including Deniliquin) (Victoria); Bunbury, Cairns, Gold Coast (including Murwillumbah), Mackay (Queensland). These services also averaged a loss of around \$95,000, with only four of these licences recording a profit.

In order to examine the difference between AM and FM services held by the same person in competitive markets, the profitability, total revenue and advertising revenue for these licences are compared in Figure 24.

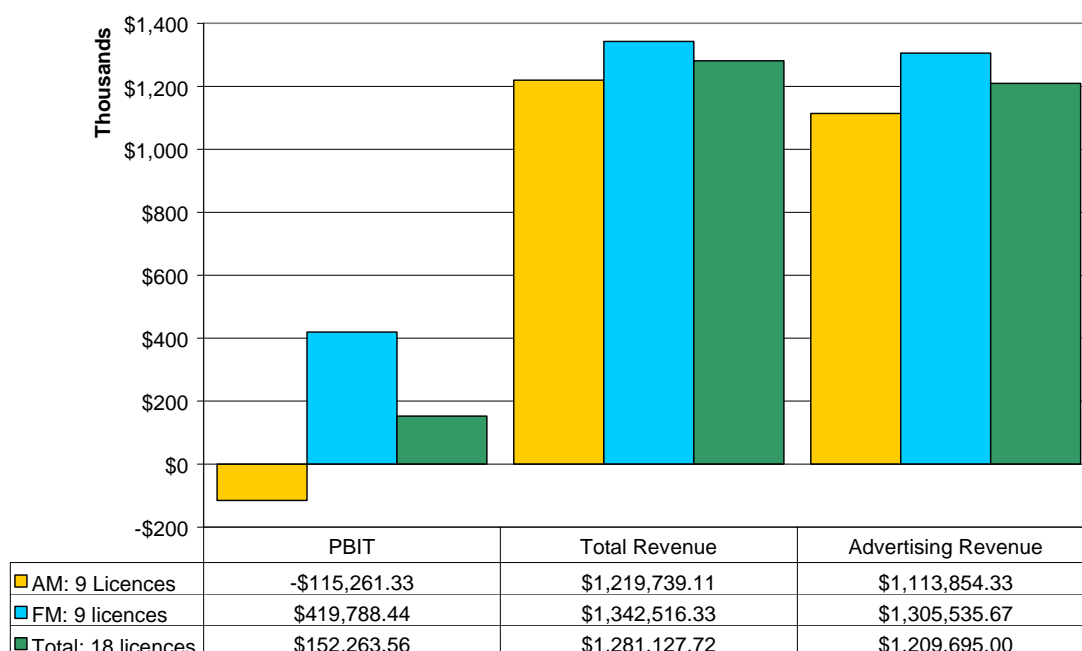


Figure 24 – Financial performance of AM and FM licences in competitive markets where the owner owns one of each

Figure 24 shows the different financial performance of AM and FM licences where the owner was in competition in that market. These are the markets of Albury, Dubbo, Moree, Newcastle (New South Wales); Bunbury, Bundaberg, Rockhampton and Toowoomba / Warwick (Queensland). In these markets, FM services received greater average revenues than AM, and higher profitability. However, the proportional revenue difference between AM and FM is not as great as the difference in profitability would

suggest. While AM received around \$150,000 less in average total revenue from a base of \$1,280,000, these AM stations averaged a loss of \$115,000 while FM licences averaged a profit of \$420,000. In this category, six stations in three markets were in loss, two of which were FM, albeit in different markets.

In Rockhampton, there are two owners, who each owned an AM and an FM. In Bunbury and Toowoomba/Warwick, the owners competed against AM licences (one in Bunbury and two in Toowoomba/Warwick). In the other five licence areas, the competition was against FM licences only.

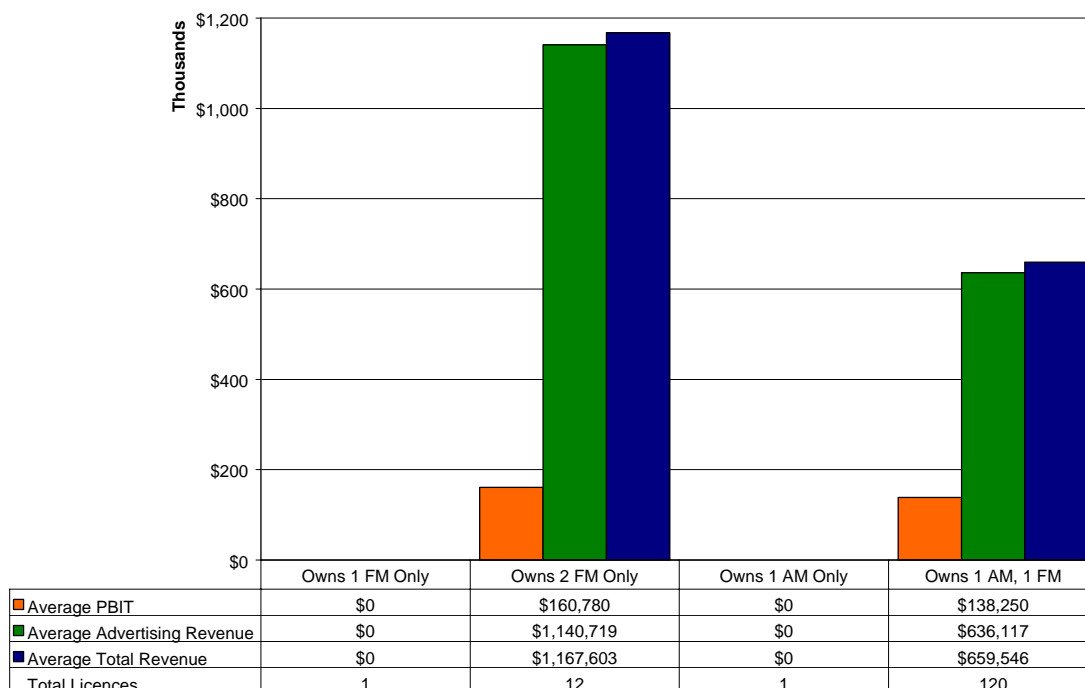


Figure 25 – Financial performance of all monopoly markets (grouped by licences held in the market)

Figure 25 suggests that the most lucrative monopoly markets were those where there are two FM licences only. These markets’ average advertising revenue was around \$1.15 million. These markets are Geelong (Victoria), Maryborough (Queensland), Geraldton (Western Australia), Darwin (Northern Territory) and the Remote West/North East Queensland and Remote Western Zones. There was a large standard deviation of the advertising revenue, around \$830,000, which is accounted for by the inclusion of some large regional as well as some relatively remote areas within this category.

The average advertising revenue in markets where the owner has one AM and one FM licence is around \$635,000. The advertising revenue of these markets is also quite disparate, with a standard deviation of around \$490,000. As there were 60 markets in this category, the individual market sizes are quite differentiated, which may account for the relatively large standard deviation.

As there was only one monopoly market with one AM licence only (in Launceston) the performance of this service cannot be disclosed. There was also only one monopoly market where there was one FM licence only. This is the Remote Central Zone area.

However, as this area is a remote area covering a large area with relatively few people, the financial figures are likely to be at the lower end of the performance of monopoly markets.

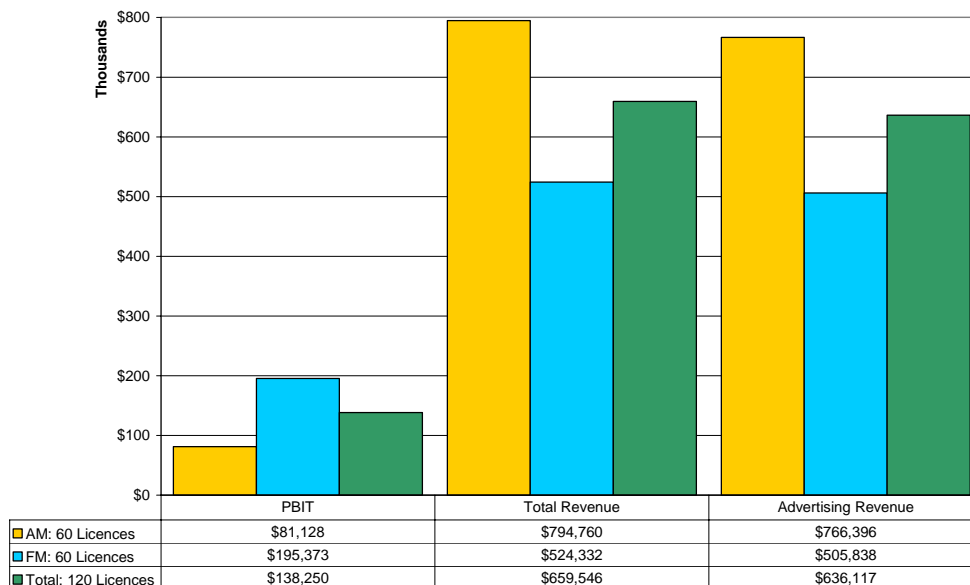


Figure 26 – Financial performance of AM and FM licences in monopoly markets where there is only one AM and one FM licence in the market

Examining those monopoly markets where the owner has one AM and one FM licence shows that the revenues received for AM licences is, on average, better than the revenues received for FM services. However, the profitability of AM services in this category is low, averaging less than half the profitability of the FM licences in the same category. The reason for this is not clear, although services in these areas might be recording shared costs in relation to the AM service only.

Transmission establishment and operating costs

Capital costs

It is difficult to compare the cost of establishing an AM transmission facility as against an FM transmission facility given the different requirements of broadcasting services, site to site and service to service. However, some generalisations can be made if it is assumed that the service in question does not have restrictions on its coverage pattern and if the frequency assignment and transmitter power of the service in question is similar to other services in the same market.

There are a number of ways in which a transmission facility can be established. The most common ways include:

- purchasing a new transmitter and antenna, and constructing the tower or mast. This is the most expensive option, as all the capital cost is borne by one person
- purchasing a new transmitter, but sharing the antenna and tower or mast of another. This requires the addition of a shared combiner, which enables the different signals to be combined in the one antenna. This is likely to be the cheapest option, provided that

the technical characteristics of the service are similar to those of the other services sharing the antenna and tower or mast, and

- purchasing a new transmitter and antenna, but sharing the mast or tower. This option represents the mid-cost option.

Generally, it is more expensive to share an antenna when the service in question is AM. This is because the antenna should be an appropriate length in relation to the wavelength of the frequency of the signal. If the wavelength is similar, it is possible to use an antenna that is appropriate for both frequencies. If the wavelength is too dissimilar, this becomes more costly, or causes transmission difficulties.

In the case of the FM band, the wavelength of frequencies deviates approximately 10 per cent from the centre of the band, while in the case of AM the deviation is approximately 50 per cent. The relatively large deviation in the wavelength of frequencies used in the AM band means that it is difficult to engineer an antenna that will perform effectively for frequencies at different ends of the band. This in turn makes sharing an antenna or mast uneconomic in some circumstances.

Indicative capital costs of establishing a new broadcasting service are:

- purchase of a 20 kW transmitter and antenna and construction of a tower for an FM service – between \$500,000 and \$1,000,000, depending on requirements and location
- purchase of a 20 kW transmitter for an FM service, sharing a suitable antenna on an already existing tower – approximately \$550,000
- purchase of a 1 kW transmitter and a new antenna for an FM service on an already existing tower – approximately \$250,000
- purchase of a 10 kW transmitter and construction of two masts for an AM service – approximately \$2,500,000
- purchase of a 5k W transmitter for an AM service, sharing a suitable antenna on an existing single mast – approximately \$600,000.³³

Ongoing costs

The ongoing cost of running transmission facilities is largely dependent on the equipment used and the power requirements of the transmitter. These are not significantly different as between AM and FM. The key ongoing costs for transmission of broadcasting services in the AM and FM bands are:

- power costs for the transmitter and other equipment
- maintenance of the transmitter and other equipment
- access fees to the site or infrastructure (where the site or infrastructure is a shared facility) and
- return on investment exacted by a transmission service provider over the life of the contract where new capital invested in establishment of the service has been purchased by the transmission service provider.

³³ Clive Morton, Broadcast Australia, 11 April 2005, personal communication.

Suggestions for changes to the ownership and control rules

As discussed in the previous section some AM licences remain both popular and lucrative. However, it has been suggested that the two-station limit should be varied for AM licences in light of their disadvantages in comparison with FM. The regulatory policy underpinning the current rules states:

The Parliament intends that different levels of regulatory control be applied across the range of broadcasting services ... according to the degree of influence that different types of broadcasting services ... are able to exert in shaping community views in Australia.³⁴

AM services that carry high rating talkback formats are considered by many to be among the most influential of radio services.

While commercial radio broadcasting services are intended to provide broadcasting services of general appeal, open narrowcasting services are broadcasting services whose reception is limited because:

- the service targets special interest groups or
- the service is intended for limited locations or
- the service is provided during a limited period or to cover a special event or
- the service provides programs of limited appeal or
- the reception of the service is limited for some other reason.³⁵

There is no mechanism for a commercial radio broadcasting licensee to convert their commercial broadcasting service into a narrowcasting service. Therefore, where the format of an AM commercial radio service becomes limited for some reason, for instance if it becomes a foreign-language service or a racing radio service,³⁶ it is not treated by the Broadcasting Services Act as a narrowcasting service and the control restrictions still operate to prevent its owners from purchasing extra commercial radio licences. This is despite the likelihood ACMA would treat the service as narrowcasting in the absence of a commercial radio broadcasting licence.

However, the number of AM commercial radio services that ACMA would treat as narrowcasting in the absence of a commercial licence is still quite small. If an appreciable trend in AM commercial services gravitating towards narrowcasting formats were to develop in future, it may be that the continuation of the concentration rules would be inappropriate for such uninfluential services. In the alternative, relaxation of the concentration rules in relation to commercial services that have become narrowcast services may undermine the licence area planning processes undertaken by ACMA.

Wholesale relaxation of the ownership and control concentration rules for the entire AM commercial radio sector would not appear to be justified given that some of the most profitable and highest rating commercial radio services use AM.

³⁴ Section 4(1) of the Broadcasting Services Act.

³⁵ See section 18 of the Broadcasting Services Act.

³⁶ Provided that the racing radio service is compliant with the relevant determination under section 19 of the Broadcasting Services Act.

CONCLUSIONS

The AM radio market continues to evolve. Over time, there has been a shift of listeners from AM to FM and greater competition for audiences with the introduction of new FM radio services. At the same time, talk formats on metropolitan AM radio continue to perform relatively well in terms of audience share and profitability. In the early 2000s, the metropolitan AM sector has also seen an improvement in relative audience share against the FM sector. Recent audience share trends for ABC services in Sydney, Melbourne and Adelaide suggest that AM radio, as a medium, is capable of some degree of reinvention.

In monopoly markets where there is one AM and one FM service, the AM service receives higher average revenues than the FM service, but its profitability is lower. In competitive markets where an owner has one AM and one FM, the AM service generally receives lower revenues and profitability than the FM service owned by that person.

In the majority of cases, the opportunity for owners of AM licences to achieve economies of scale with other licences has already been realised, either within the same market, or across a number of markets.

Despite a lack of clarity of the precise value of AM licences, it is likely that the price an AM licence would attract upon sale or has attracted in previous sales would factor or would have factored in its current performance and likely future performance. Further, as more than three-fifths of the available AM licences have been sold or partially sold in the last five years, it would seem that there is still capital interested in investment in AM despite technical, audience and profitability issues.

The steady market of AM licences for sale over time, and the inclusion of some high performing stations over the period would suggest that the AM sector is not in terminal decline.

ACMA will continue to monitor commercial AM market share (including in regional markets), the industry's financial situation, and ownership and control issues affecting AM services.

At this stage ACMA does not see a need for AM specific changes to the regulatory settings governing control of commercial licences, particularly in metropolitan markets. However, if there is an increase in the number of services licensed as commercial radio broadcasting services that have narrow or niche formats, it might be appropriate to consider ways of amending the legislative framework to provide for more appropriate regulatory settings. ACMA does not have any view on the merits of changing the control rules in relation to commercial radio broadcasting services generally. However, consideration might be given to whether a legislative framework that would allow commercial radio services to convert to open narrowcasting services would be appropriate in the future.

Digitalisation

Digital radio promises higher quality audio, ancillary data (for example, radio play-lists) and clear reception. Depending on the standard selected, digitalisation of AM services also has the potential to resolve some of the transmission concerns and issues surrounding urban encroachment on AM transmitter towers. Of course, digitalisation may encounter site difficulties and community concern about electromagnetic radiation issues arising from urban encroachment in its own right.

Given the potential benefits of digitalisation for AM radio services, it may be that the history of AM radio to date will not be an adequate predictor of its future performance.

There are a number of ways in which digital audio services can be introduced. One option is for the existing analog radio services (AM and/or FM) to be converted to digital as a means of achieving spectrum efficiency and make spectrum available for future reuse. Alternatively, the introduction of digital radio services could be seen as an opportunity for the incremental increase in platforms providing audio services. Overseas experience suggests that both of these options have some currency.

At this stage, the appropriate model for introducing digital radio in Australia or indeed which technical standard or standards to adopt has not been determined. Of the currently available digital standards for radio, Eureka 147 (also known as Digital Audio Broadcasting (DAB)) is pre-eminent, although many observers see Digital Radio Mondiale (DRM) as a complementary standard to DAB.³⁷ The DAB standard is the most mature, while DRM is only now being deployed and few commercial receivers are available.

Digitalisation policy is of particular relevance to AM for several reasons. Racing radio, which is a common AM format, has an interest in the ancillary data-carrying capacity of DAB. Also, the particular problems and challenges faced by AM operators have made AM licensees supporters of radio digitalisation in the past. Radio digitalisation is sometimes touted as a solution to transmitter site access problems, notably in relation to Homebush Bay. However, early conversion of AM radio to a digital system is highly unlikely to provide an early solution to Homebush Bay. Even if a full conversion model were adopted tomorrow, with priority for AM services, ACMA would see little prospect of an end to AM simulcasting for decades. Nor are there any other pressing reasons to clear the MF AM bands. Internationally, there are no new applications emerging for these bands other than the digital radio systems DRM and AM IBOC (In-band On channel).

On the other hand, the existence of wide coverage regional AM radio alongside more limited coverage FM regional radio poses a major challenge for radio digitalisation in the event a conversion model was adopted.

³⁷ An alternative digital standard using frequencies in the AM band is the AM in-band on-channel standard (AM IBOC), although this has only been standardised for the 10 kHz channel spacing used in the USA, whereas Australia and many other countries use 9 kHz channel spacing.

EUREKA 147 – DIGITAL AUDIO BROADCASTING SYSTEM (DAB)

The DAB standard would enable the conversion of AM radio to digital and could achieve near-CD quality signals, which is superior in quality to current FM broadcasts. The DAB standard also allows trade-offs between sound quality, the number of radio services and the amount of ancillary or other data carried. The DAB standard is not ideal for rural areas due to a shortage of vacant VHF band III spectrum in Australia and because it cannot match the current wide coverage of some regional AM radio services. The ‘one size fits all’ nature of broadband DAB multiplexes makes it an awkward system to adopt to a full conversion model in regional Australia, where relatively small numbers of radio services with overlapping licence and coverage areas (based around AM and FM propagation) serve many areas. There is no prospect DAB could match the coverage of existing high power national AM services in regional areas. The eventual clearance of analogue television services from VHF Band III would considerably widen the opportunities for wide coverage DAB radio services in regional areas, but even DAB using VHF Band III is unlikely to completely replace the wide coverage AM services due to the differing propagation characteristics of the MF and VHF spectrum.

Furthermore, as the DAB standard relies on a ‘multiplex’ arrangement, it is not possible to design different licence areas for individual services to cover similar but distinct areas: a number of services must share the same licence area. If conversion of existing commercial, national and community services were desired, including city-wide and suburban services, it may prove challenging to match the same coverage areas as are currently achieved by the individual services.

During negotiations with landowners of transmission sites in Homebush Bay, commercial radio broadcasters have indicated that if digital conversion of all current Sydney analog radio services to the DAB standard occurs, it may be possible to decommission use of the Homebush Bay sites within 10–20 years. If this were to occur, it may overcome the pressures currently being experienced in metropolitan areas for the clearance of AM transmission sites near built-up or residential areas. However, there is uncertainty about whether a conversion time-frame of 20 years is realistic if there is no other compelling feature of digital radio other than an increase in quality of broadcast.

The experience of conversion of analog television to digital may prove informative in predicting a realistic conversion timetable for analog radio. The policy settings for digital television currently favour digital television as a medium primarily aimed at increasing the picture and sound quality of television broadcasts, with limited ability to capitalise on additional features that may be possible in a digital environment. In metropolitan Australia, almost half of the simulcast period has elapsed,³⁸ but the number of Australian homes with digital set-top boxes or integrated digital televisions to June 2005 was around 820,000,³⁹ which is a take-up rate of about 10.8 per cent of households.⁴⁰ It would appear

³⁸ Currently the full suite of digital services reaches 84 per cent of the Australian population.

³⁹ Press release from Digital Broadcasting Australia, ‘DTV sales to June 2005 reach 920,000 units’, 2 August 2005, www.dba.org.au.

⁴⁰ Digital Broadcasting Australia indicate that sales of digital television receivers to retailers does not directly compute into free-to-view digital television home up-take or penetration. This is because a certain amount of sales to retailers are held in inventory, which Digital Broadcasting Australia estimated to be around 50,000 receivers or somewhere around one month of stock. Secondly, an unreported number of television homes will have more than one free-to-view digital television receiver. Digital Broadcasting Australia assumed that around 50,000 free-to-view digital television homes have more than one free-to-view digital television receiver.

that a model that provided for no more than the conversion of analog radio to digital would be unlikely to achieve decommissioning of analog AM transmitter sites within 10 years of the commencement of simulcast. Were there to be some other benefit of digital radio however, such as additional services or enhancements clearly distinguishing it from FM, it may be possible to achieve quicker conversion than otherwise. However, the current cost of digital radio receivers, the evident loyalty of older Australian audiences to AM rather than FM radio and the absence of international pressure to resume the MF spectrum for other purposes all suggest that a conversion timeframe of 10 years is likely to be unrealistic, despite the availability of attractive new applications using DAB.

DIGITAL RADIO MONDIALE (DRM)

According to the DRM consortium, DRM offers near FM quality sound and an improvement in reception over analog in the AM band.

Trials of DRM are currently underway in the medium frequency (MF) band in Europe, China, New Zealand and Thailand.⁴¹ More extensive broadcasting is taking place in the high frequency (HF) bands by the world's major HF broadcasters.⁴² According to the DRM consortium, there are currently more than 70 broadcasters transmitting DRM services worldwide.⁴³

The DRM standard allows digital services to be interleaved with analog services in the same band, using the same channel bandwidth as analog AM radio, thus allowing for additional DRM services to be allocated in the AM band or, where there are adequate frequencies available, for AM services to be converted to digital within the AM band.

Instead of merely interleaving DRM services with analog AM services, the DRM standard would also allow an AM broadcaster to modify its AM analog transmitter to transmit in digital, simply switching off the analog service one day and transmitting the DRM service the next.

On 10 March 2005, the DRM consortium announced plans to extend the applicability of DRM beyond the MF and HF bands to incorporate frequencies up to 120 MHz in the VHF band.⁴⁴ This would include the frequencies currently in use for FM radio in Australia (87.5 MHz–108 MHz) as well as frequencies used for VHF Band I (45–70 MHz) television services (i.e. channels 0, 1 and 2). It is expected that the new standard would be completed testing by 2010.

Conversion to DRM (digital – in the MF band or VHF Band I) and/or FM (analog – in VHF Band II) in regional areas

If a conversion model is ever adopted, the wider reception area achievable with DRM in the MF band could make it a suitable standard for conversion from analog AM services to digital AM in rural areas where wider coverage is more important than the greater ancillary data carrying capacity of DAB. This is because the DRM standard in the MF band utilises the propagation features of that band, which is known for its ability to travel long distances.

⁴¹ The AM band (526.5 kHz–1606.5 kHz) is in the MF band (300 kHz–3 MHz).

⁴² The HF band (3 MHz–30 MHz) is for use by short-wave broadcasting.

⁴³ <http://www.drm.org/pdfs/newsevents/DRMatNAB05final.pdf>, 14 April 2005.

⁴⁴ <http://www.drm.org/pdfs/newsevents/DRMDABpressrelease.pdf>.

However, the potential for AM to cover long distances has traditionally been of greater significance to the national broadcasters (especially the ABC) than it has to commercial radio operators. Many of the regional AM commercial radio broadcasting services value quality of service over distance of coverage, and would therefore prefer conversion to FM. As the number of available wide coverage AM frequencies for use by DRM is currently limited, converting regional AM commercial services to FM may be warranted. Conversion would be likely to yield additional wide coverage AM frequencies for DRM for use by national broadcasters in the short to medium-term.

Further, there may be little or no disadvantage to other commercial services in the same market, especially where there are only two services, and both of these are controlled by the same operator.

However, with the possible extension of the DRM standard to include VHF Band I it may be that a medium-term solution is the provision of radio services using DRM in VHF Band I. The coverage of VHF Band I is wider than VHF Band II, but not as wide as the MF band. Depending on the DRM standard developed in the VHF band, the requirements of commercial radio broadcasters for higher quality might offset the narrower coverage of DRM in VHF Bands I and II. Furthermore, ACMA (as the former ABA) has not extensively allocated television frequencies in VHF Band I, and it is therefore likely that there will be sufficient spectrum in the medium term to utilise both the AM band as well as VHF Band I to convert existing AM broadcasters to DRM.

DRM in metropolitan areas

There does not seem to be a compelling case for the conversion of AM services to FM in metropolitan areas. As noted above, metropolitan AM services are considered by many to be among the most influential commercial radio services in Australia, and would seem to be attracting healthy revenues at the moment. Further, the spectrum capacity in the FM bands in metropolitan areas is quite limited, and the conversion of AM services to FM in these areas would only be likely to be possible with the degradation of coverage and reception quality of existing FM services. This is unlikely to be a palatable option for listeners or existing FM operators.

In metropolitan areas, DRM in the MF band could also be used to introduce new wide-area digital services. However, as the DRM standard in the MF band would use the same transmission facilities as current AM services, adding another service could add to community concerns regarding electromagnetic radiation in built-up areas around transmitters, like at Homebush Bay. In order to avoid these problems should DRM be introduced in metropolitan areas in the MF band, it might be necessary to address the cumulative effect caused by introducing DRM services in the MF band. It should be noted that to match existing AM coverage the DRM transmissions would operate with approximately one quarter the power of the current AM services. To date, Commercial Radio Australia has indicated it has no interest in DRM as a metropolitan area solution, preferring an all-DAB approach in the biggest cities. The views of national broadcasters are unknown but they may be more positively disposed towards DRM in the MF band in cities. SBS has expressed interest in trialling DRM in the MF band. Some ABC city services are in effect regional services with extremely wide coverage that DAB (using VHF Band III) could not match.

The extension of DRM to include VHF Bands I and II could, in the medium to long term, ease the current congestion of services in metropolitan areas and enable the allocation of new radio services as well as the conversion of sub-metropolitan community radio services to digital mode. This could, in turn, reduce the number of services using the AM band in metropolitan areas, leaving only those services which seek extremely wide coverage, such as the national services.

HYBRID RADIO DIGITALISATION STRATEGY?

The utility of DAB in metropolitan areas and DRM in rural areas raises the question of whether it would be feasible to introduce both DAB and DRM into Australia as a hybrid digital solution.

For such a hybrid solution to succeed, a market for affordable combined DAB/DRM radio receivers would need to develop. Without an overseas market for such devices, it is unlikely that manufacturers would consider it economical to manufacture them specifically for Australia. It has been predicted that in Europe, broadcasters may adopt both the DRM and DAB standards.⁴⁵ If this dual digital solution were to be adopted in Europe, it would be likely that a market for affordable hybrid receivers would develop. However, there are currently no dual DRM/DAB tuners. Despite this, at least one country, Germany, has both DRM and DAB services operating in the same area. DRM is at an early stage of deployment, with consumer receivers not generally available, so the current lack of dual system receivers is not unexpected. Dual system DAB/DRM receivers are expected to be available in Europe late 2005.

Although DRM is designed to use the same channels currently available for use by AM services, it nevertheless requires a clear frequency. Conducting trials of DRM or introducing DRM in parallel with analog AM radio will mean frequencies will need to be identified and possibly cleared. However, the sheer weight of problems facing a DAB-only conversion policy at this stage suggests government and industry should take a more active interest in DRM and the prospects of a DAB/DRM hybrid option. Trials of DRM could be conducted in Sydney using the 1386 kHz channel, or in Canberra on 1440 kHz. Retaining suitable channels for trials would seem desirable in the short term.

As a long term strategy, serious consideration should be given to retaining unallocated AM frequencies to allow a suitable plan to be developed for a transition from AM broadcasting to DRM broadcasting in the MF bands. ACMA is currently seeking public submissions about the future allocation of frequencies in light of the digital radio developments occurring worldwide. It is expected that these submissions will form a basis for further dialogue with the Department of Communications, Information Technology and the Arts about future short and long term policy with regard to digital radio.

⁴⁵ See, for example, the presentation by Philip Laven, Director Technical Department, European Broadcasting Union, to the ITU-EBU Workshop, Sofia, 8 June 2004: http://www.itu.int/ITU-R/conferences/rrc/rrc-04/intersession/workshops/CEE/pdf/2_1_Digital_Broadcasting_Technology_EBU_Laven_ppt.pdf

CONCLUSIONS

Given the ability of the two digital radio technologies to meet different challenges posed by AM, ACMA will continue to monitor developments with both DAB and DRM technologies to identify appropriate digital solutions for AM radio.

ACMA as the ABA has sought public submissions on the merit of placing restrictions on the planning and allocation of broadcasting services in certain frequency bands that may be suitable for digital radio. In this context, ACMA was interested in receiving information on the merit of placing restrictions on vacant AM frequencies that may be of value either for DRM trials or for the provision of digital radio services under a DAB/DRM ‘hybrid’ model.

The majority of disadvantages experienced by AM services in the analog environment need not be replicated in the digital environment. Conversion of regional analog AM to FM ahead of digitalisation could therefore be considered in the framework of a holistic digitalisation policy.