Executive summary

- Television has been an important political and cultural force in Australia since its introduction in the 1950s.
- Analogue technology has been used to deliver television broadcasts—at first in black and white, and since the 1970s, in colour.
- Analogue transmissions are scheduled to cease, however, in 2013. They will be replaced by digital technology.
- Digital technology uses broadcasting spectrum more efficiently and offers audiences a significantly better viewing experience, delivering superior images, better audio quality and improved reception.
- The development of digital television began internationally in the 1980s. In Australia, the road to digital conversion began in the late 1990s.
- This paper traces that road, which has been complex, and arguably, strewn with mistakes and missed opportunities.
- The paper discusses also the difficulties that have been encountered by policymakers in attempting to develop and implement a digital policy which satisfies broadcasters, grabs the imagination of consumers and encourages innovative use of digital technology that goes beyond a passive television experience.
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Introduction

Television has been acknowledged as ‘a dominant political and cultural force in modern life’.¹ As one commentator notes when referring to its impact:

We have watched wars as they happened and seen man’s inhumanity ... We have watched history good and bad being made ... We have shared great sports events. We have been mesmerised by the beauty of nature and wildlife ... We have laughed at great entertainment ...
All this through the medium of television in the comfort of our own homes.²

Analogue technology has been used to deliver these experiences through the broadcast spectrum—at first in black and white and more recently, in colour.³ But analogue television transmissions will soon be superseded by digital technology.

Digital technology makes more efficient use of broadcasting spectrum to offer a greater choice of programs and information, such as multi view programming, blocking of unwanted programs or viewing programs at times viewers choose.

The transition from analogue to digital has been described as a ‘transition from a world of spectrum scarcity, dumb terminals, and one-way services, to a world of on-demand programming, intelligent terminals, and abundant channels’.⁴ It is a transition seen by many as long overdue in a broadcast industry which has often failed to keep pace with revolutionary changes in the telecommunications and information services industries.

The Australian Broadcasting Authority (ABA) working group on the development of digital terrestrial television for Australia observed in 1995:

For decades television engineers have striven to deliver the picture quality they have been able to generate in the studios to home viewers. Their efforts have been hampered by the inherent limitations of the analog [sic] system. Now, with digital video technology it is possible to realise this ambition.⁵

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3. Black and white television was first broadcast in Australia in 1956; colour broadcasts commenced in 1975.
4. Galperin, op. cit., p. 3.
5. Australian Broadcasting Authority (ABA), Specialist Group on Digital Terrestrial Broadcasting, Digital terrestrial television broadcasting in Australia, First report, ABA, 1995, p. 13. Note: the ABA merged with the Australian Communications Authority in 2005 to form the Australian Communications and Media Authority (ACMA) and future references in the text in this paper to ABA or to ACMA will refer only to ACMA.
Achieving this new world of broadcasting requires dramatic changes in production and infrastructure which various countries are tackling at different speeds and which various populations are embracing with degrees of enthusiasm.  

The transition to digital television is expensive. As media commentator and academic Jock Given notes, governments around the world have accepted the immense costs and risk of overhauling terrestrial television systems because they have calculated the direct and indirect advantages from the conversion. Given adds however, that these costs and the complexity of transition for consumers and broadcasters alike have been underestimated. Consumers need to purchase new receivers or set top converters; broadcasters have to install new transmission equipment as well as pay the costs of simulcasting in analogue and digital for extended periods, and absorb the costs of fundamental changes to their businesses. For these reasons alone, Australia, like many other countries, has found the process of conversion to digital television protracted and frustrating. In Australia’s case, there have been additional complications in the transition process arising from policy choices, the reluctance of audiences to embrace digital technology and a unique broadcasting tradition, which has traditionally favoured commercial free-to-air operators.

This paper discusses the development of digital television and provides a brief explanation of how it differs from analogue and the advantages it offers for viewers. It traces the digital terrestrial story in Australia from the planning stages in the early 1990s to the turning off of the analogue signal in the first switchover areas on 30 June 2010. In the process, the paper discusses some of the complexities encountered in making what is undoubtedly a radical change to the broadcasting environment.

**Definition**

Digital and analogue television transmissions are both delivered using radio frequency signals. The fundamental difference between the two technologies is in the way the information is encoded into these signals. The video component of standard analogue television is transmitted by AM signals and the audio in FM. Analogue television signals vary in accordance with the colour and brightness of the elements of the original pictures being broadcast. Any disturbance to an analogue television signal, (for example, noise along the transmission path), introduces impairments that cannot be removed. These impairments result in reduced quality of resolution.

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6. For example, in 2005, digital penetration rates in the United Kingdom were 68.9 per cent, while in the Netherlands they were only 11.4 per cent, sourced from Screen digest quoted in M Cave and K Nakamura, ‘Digital television: an introduction’, in M Cave and K Nakamura, Digital broadcasting: policy and practice in the Americas, Europe and Japan, Edward Elgar, Cheltenham, 2006, p. 5.


8. Ibid.

• Digital television converts video and audio components into an on/off code which is then transmitted and decoded by a specifically designed television set, or a standard television set which is connected to a set-top conversion box. Because digital television signals are transmitted as a stream of on/off bits they are not affected by disturbance which may occur in the transmission path.

Benefits of digital television

• It is generally accepted that digital television is superior to analogue television. One assessment claims digital television is:

  ... the most significant development in television technology since color (sic) television because of features such as better picture resolution and the more efficient use of spectrum. [Digital television] also allows a broadcaster to offer multiple programs (multicasting) or a single program of high definition digital TV.

Image

There are two types of digital television transmission recognised in Australia: Standard Definition (SD) and High Definition (HD). Both types produce better picture quality than analogue but HD delivers a sharper image than SD, as the cartoon shown below attempts to illustrate.

Superiority of HD pictures

Source: Harries

10. ACMA, for example, makes this point, viewed 8 January 2010, http://www.acma.gov.au/WEB/STANDARD/pc=PC_91870
12. Note: the United States recognises a third category of digital television; enhanced definition (ED) television. This has the same resolution as SD digital, but uses progressive scanning instead of interlaced scanning. This is said to create a ‘smoother’ overall picture. ED can be in either 4:3 or 16:9 aspect ratio with a resolution of either 480 x 640 or 480 x 720 pixels (480 lines are used in the United States as opposed to the 576 lines used in Australia). See the Glossary for an explanation of interlaced and progressive scanning.
SD digital television has the same resolution as traditional analogue television. The resolution used for SD is 576i, that is, 576 horizontal lines which are interlaced (see explanation later in this paper). There are a number of HD resolutions. These range from the 576p (that is, 576 horizontal lines progressive), to the current maximum broadcast resolution of 1080p.

Australian broadcasters have chosen a number of formats with which to transmit HD. Until recently, the Special Broadcasting Service (SBS) used 576p but upgraded to the 720p format which is also used by the Australian Broadcasting Corporation (ABC). The Seven and Nine networks main HD channels use 1080i, as does Ten’s One HD.

As illustrated below, both SD and HD television transmit in widescreen. The aspect ratio for standard television is 4:3, while widescreen aspect ratio is 16:9.

Aspect ratio

![TV with 4:3 aspect ratio](image1.png) ![Widescreen TV with 16:9 aspect ratio](image2.png)

Source: EAC

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15. 576p is not regarded in many countries as true HD. The more universally accepted minimum HD standard is 720p. See SBS transmission page, viewed 8 January 2010, http://www20.sbs.com.au/transmissions/

16. Note that a 1080p format is also available, although this is primary used in the Blu-ray format and is not currently broadcast by television stations. See Glossary for explanation of Blu-ray.

17. Note: widescreen television is not exclusive to the digital television format. Analogue television can also be delivered in a widescreen format.

Sound
SD is broadcast with MPEG digital stereo sound. This produces similar sound quality to that heard on a CD. Some standard definition programs can be enhanced with Dolby Pro Logic or Dolby Digital surround sound. Dolby Pro-Logic can produce four sound channels (front left, front centre, front right and surround). Dolby Digital surround sound delivers a sound effect similar to that heard in cinemas from five individual sound channels (front left, front centre, front right, surround left and surround right). In addition, Dolby Digital provides a low-frequency sound channel which is used for deep bass effects. HD digital television uses MPEG or DD2/0 or Dolby Digital 5.1.19 (See Glossary for explanation of the terms used in this paragraph).

Improved reception:
• It is argued that digital television is superior to analogue because there is no gradual signal loss as the distance from a transmitter increases. There is some conjecture that this may not be as advantageous as it is promoted. Analogue signals may become fuzzy as the signal weakens, but they remain coherent, whereas digital signals may be perfect up to a certain distance, but then cut out completely. This precipitous drop off in signal is known as the cliff effect (see the diagram below). The effect can be minimised by installing a quality antenna. Another reception problem with digital television is pixelisation that can be caused by impulse noise from general household appliances. This can usually be fixed by quad shielding cables and using special connectors.
• Digital cliff effect

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19. MPEG is a standard used for the digital compression and multiplexing of video and audio signals. See Glossary for more explanation.
Box 1: analogue to digital

In digital television, each pixel in an analogue picture is given a digital code to identify its colour, light intensity and placement on a picture grid. When a picture has been scanned and converted into a digital format, it is represented by a string of ones and zeros. This means for example, the digital code 1110011 might identify the red pixel of medium brightness four squares from the left hand edge of the picture and three squares up from the bottom.

While a considerable amount of data is required to transmit a digital television picture, a great deal of the information transmitted from frame to frame is the same. Up to ninety per cent of what is sent can be reduced with no loss of picture quality. This means that in digital transmission more channels of compressed video can be sent in the same amount of bandwidth as has been required for only one analogue channel.

Development of digital television

From mechanics to digital

In 1884, the German inventor Paul Nipkow registered a patent for a mechanical device that could scan a picture. The electronic components required to put Nipkow’s system into practice were not available during the late nineteenth century, but by the 1920s, John Logie Baird was able to produce a workable mechanical television set. The picture delivered by the Baird invention, however, was small and of poor resolution, and Baird’s sets did not achieve wide sales or use.21

The diagram below illustrates Baird’s mechanical television:

Source: Public Broadcasting Service22

During the 1930s and 1940s, different electronic inventions improved the resolution of television pictures by scanning pictures into a number of lines. Several different systems came into use, but the pictures they delivered were far from perfect. Flickering, caused when the light emitted by zinc sulphide used in early cathode ray picture tubes went out before a whole picture was drawn, was a major problem. Flickering was largely solved by the introduction of interlaced scanning. This involved scanning every other line to produce a half picture, or picture frame. Pictures could then be displayed at double the rate to improve the overall result.

The diagram below illustrates the workings of an electronic picture tube.

Source: Public Broadcasting Service

Prior to the 1950s, (and in some cases, well into the 1970s and 1980s), television pictures were broadcast in black and white. Colour television was first introduced in the United States in 1953, but the National Television System Committee system (NTSC) used by the Americans, experienced a number of problems with colour tones. The system was sometimes referred to as NTSC—Never the Same Colour. In the mid 1960s, another colour system, the Phase Alternating System (PAL), was introduced by the Germans, and the French also invented a colour system, the Sequential Couleur avec Memoire (SECAM).

As television historian Martin Bell notes:

Colour was an immediate hit with the public. The spectacle was just so much better than black and white pictures. Colour was a must-have.

23. An American system consisted of 525 lines, the United Kingdom system of 405 and a French system of 819 lines. Lundstrom, op. cit. considers the French system was ahead of its time and could almost have been classified as high definition.
24. PBS, TV grows up, op.cit.
26. Lundstrom, op.cit. Note: Australia chose to adopt the PAL system.
While colour was a substantial leap forward, the search for the perfect television picture did not stop with its introduction. In the 1980s, the Japanese Broadcasting Corporation began to transmit better, wider pictures and improved sound quality in an analogue, high definition format. One substantial problem with the Japanese invention was that it required more bandwidth than the standard analogue signal used in Japan and the Americas at the time. In addition, the system experienced problems in processing the large volume of data needed to correct errors in pictures. Around the same time as the Japanese system was introduced, the Multiplexed Analogue Components system (MAC) was developed in Europe. This system was able to broadcast digital audio and wide screen video; an improvement on the existing PAL system. This system was trialled unsuccessfully at the Barcelona Olympics in 1992.

The appearance of digital television was substantially the result of the failure of the improved forms of analogue television to use frequency bandwidths more efficiently. Analogue could not free up frequency for use by new technologies that had begun to materialise in the 1980s, so developers began to consider if computer and communication advances could provide the format for enhancing television. Hence, digital television came to consist of ‘sampling and encoding video signals as a stream of zeros and ones and transmitting this data stream through a transport platform to a receiving device’. Digital television amounted to a more effective management of the precious and finite resource of radio spectrum (see Glossary for definition of frequency and spectrum).

Two main digital television standards have since been adopted—the Advanced Television Standards Committee Standard (ATSC) and the Digital Video Broadcasting Standard (DVB). The DVB Standard, used extensively across the world, was the result of various collaborative projects undertaken in Europe throughout the 1990s by broadcasters, manufacturers and regulatory bodies. The ATSC standard was adopted in December 1996 in the United States by the Federal Communications Commission via a ‘beauty contest’ allocation. Telecasts began in America in 1998 and the ATSC was later adopted in Canada, Mexico, Taiwan and South Korea.

Switchover strategies
A number of countries have completed the switch to digital television. These include Germany, Finland, Luxembourg, Sweden, the Netherlands, Belgium and major areas of Austria. All European

28. These involved the development of optical fibre for carrying communications and computers that were able to handle data much faster than previously.
30. Analogue standards have been the National Television Standards Committee standard (NTSC), used in the Americas, Japan and some other Asian countries and the Phase Alternating Line (PAL) standard, used in Australian and most other countries.
Union countries are expected to have completed switchover by 2012 and it is expected that other European countries will switch off analogue services by 2015.\textsuperscript{31} The United States switched to digital in 2009, and the United Kingdom is in the process of phasing in digital.

There are a number of switchover approaches. These range from directly linking the supply of digital services to a change from analogue, to simulcasting services with analogue broadcasts for a period before either a once-only national switch off date occurs, or a phased in process is completed.

The phased in approach has proven to be a popular switchover strategy. As Germany and Sweden have found, phase in allows countries to apply lessons learnt progressively from region to region. Variations in where switch off occurs, and the number of phases involved can occur within a phase in approach. High or low population areas can be chosen for initial switch off, for example.\textsuperscript{32}

A phased in switch off means that technology choices made initially determine the status of the whole switchover. So, an issue for a phased in switchover is to ensure that the overall process does not hinder the introduction of new technologies. At the same time, a phased in approach needs to ensure that the process does not disadvantage viewers by occurring too quickly.\textsuperscript{33} The box below briefly discusses two examples of switchover strategies; one completed (the United States) and one in progress (the United Kingdom).

**Box 2: switchover experiences**

**United States**

In 2005, the United States Congress extended the initially proposed timing for a national switchover to digital transmission from 2006 to 17 February 2009. The National Telecommunications and Information Administration (NTIA) was also authorised to provide each American household with up to two US$40 coupons to purchase set top boxes. The coupon program was paid for with some of the proceeds from the auction of digital spectrum, which had raised $19.6 billion.

In preparation for digital transition, from 2007, all television sets sold in the United States were either to have digital tuners or to indicate that they would require converter boxes once switchover occurred.

Public awareness was a stumbling block for switchover. The Government Accountability Office (GAO) noted in November 2007 that 51 per cent of participants in a national survey were unaware of digital


\textsuperscript{32} Choices can bring their own problems. As one analysis notes, choosing high population areas can be ‘fraught with risk’, for if something goes wrong in the switch over millions of people can be affected. Digital Terrestrial Television Action Group (DigiTAG), *Analogue switch-off: learning from experiences in Europe*, Geneva, 2008, viewed 7 July 2010, [http://www.digitag.org/ASO/ASOHandbook.pdf](http://www.digitag.org/ASO/ASOHandbook.pdf)

\textsuperscript{33} Ibid.
transition. As a result, a coalition of private stakeholders, the GAO and the Federal Communications Commission (FCC) instigated websites to inform consumers about the transition process. When the GAO concluded that despite such public and private sector efforts, there was no evidence of a comprehensive plan or strategy ‘to track transition efforts and measure progress’, the FCC responded by producing a consumer education plan. The plan was launched in March 2008.

NTIA reported in December 2008 that more than 40 million set top box coupons had been requested, and more than 16 million redeemed. But problems with coupon distribution and ‘inadequate funding’ of the government education programs, proved problematic; Congress was forced to delay final switchover to June 2009.

It was estimated that nearly three million Americans were not prepared for the switchover and following the transition, the FCC received over hundreds of thousands of calls for assistance with digital issues, including access to coupons. Almost three months later, the number of people without access had fallen to 710 000. The coupon subsidy ended 30 July 2009.

While the FCC Chairman evaluated the American transition as successful, the Commission admitted there were some reception issues to deal with following transition. Others considered, however, there was ‘a seemingly random series of big and little problems throughout the United States’ which needed to be addressed. One viewer commented at the time:


35. Ibid.


Note: the shortage of coupons was the result of the anomaly that funding could not be allocated for new coupons until previously issued coupons which had not been redeemed reached their expiry date.

38. Note: low power television stations have been permitted to continue analogue transmission, it is not clear for how long. Low power stations generally serve small towns or communities within large cities and have some resemblance in purpose to self help transmission facilities in Australia (these are discussed later in this paper).


... the public ‘was sold a bill of goods, most people now have to use paid TV service for dependable reception. Technologically, the DTV box is flawed, and Congress should be held accountable.’

**United Kingdom**

The United Kingdom has adopted a phased transition to digital. In 1998, digital television was formally launched in the United Kingdom with digital satellite and digital terrestrial broadcasts. Digital cable television began in 1999. The British Government initially intended that digital switchover would be completed in the United Kingdom in 2010 and a Digital Action Plan was put in place to achieve this end. The staged process for 15 regions did not commence until November 2007, however, and the timetable for completion was put back to 2012. Switchover is expected to be completed in time for the London Olympics.

DigitalUK, an independent, not-for-profit organisation, was set up at government request in 2005 by the public service broadcasters and multiplex operators to lead the implementation of switchover. It launched a seven-year, £200-million campaign to inform consumers in May 2006. Following the completion of the first regional switchover, research by DigitalUK and Ofcom revealed that more than half of people buying digital television equipment were influenced by the forthcoming switchover. Indeed, the initial switchover was declared a success with residents in the targeted area ‘well informed and prepared’ and satisfied with the straightforward procedures involved.

Unlike the United States, there is no government coupon program in the United Kingdom which provides funds to all households to help finance digital transition. However, the Switchover Help Scheme provides help to elderly and disabled people to convert one television set. The scheme is expected to assist over seven million people to convert to digital. It is estimated that the cost of the scheme will be £603 million. It has been funded by an increase in the television licence fee which is paid by all television owners in the United Kingdom.

In June 2010, representatives from two of the bodies responsible for overseeing and implementing switchover reported that the project was going according to plan—it was ‘on track and within budget’.

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43. Ibid.
45. The DigitalUK website, viewed 8 July 2010, contains information about switch over timetables and is at: [http://www.digitaluk.co.uk/](http://www.digitaluk.co.uk/)
Digital television in Australia

Planning and early decision-making

Plans

Australia began what has become a long and tortuous transition from analogue broadcasting to the digital television age at approximately the same time as many other nations. In 1993, a specialist group was established in the Australian Communications and Media Authority (ACMA) to consider the approach to take to digital transition.

Reports produced by the group in 1995 and 1997 advised proceeding carefully before making technical decisions about which standards to adopt. Bowing to what it saw as the ‘substantial weight of public opinion’ the group recommended that whatever standard was chosen, it should incorporate high definition capabilities to assist in marketing digital. At the same time, it acknowledged some flexibility may be necessary to meet market demand by allowing some multi programming.48 It was adamant that all existing licensed commercial and national television services should be given a substantial helping hand in weathering the digital conversion process. This needed to entail access to, and control of a 7MHz bandwidth channel.49

The group speculated that 2000 was a possible commencement date for digital terrestrial television transmissions. It saw termination of analogue services occurring after that date following consultation between government and industry, and as the result of market factors.50 ACMA endorsed the group’s recommendations adding only that digital television should be available free-to-air, not as a pay television option.

As the findings and recommendations of the specialist group provided the basis of what was to become Australia’s digital transition plan it is regrettable that its terms of reference did not give it greater leeway to consider factors such as the impact of transition on consumers and to the importance of market forces in driving digital transition, an issue it noted only in passing.51

Responses

The specialist group’s recommendations were not well received by a number of media stakeholders. The idea of no cost spectrum for free-to-air broadcasters incensed Telstra, which wanted a competitive bidding process for the 7MHz bandwidth. No doubt Telstra believed this alternative would more likely protect its investments in data and online services, the broadband network and

49. See Glossary for definitions.
51. Ibid.
pay television.\textsuperscript{52} Subscription television operators together with John Fairfax Holdings also wanted competitive pricing of spectrum, maintaining new operators would be introduced into the system by this process. These would, in turn, enhance choices for the viewing public. The Australian Subscription Television and Radio Association (ASTRA) in particular questioned the commercial viability of the group’s support for the high definition (or HD).\textsuperscript{53} Online content providers were similarly disturbed. They predicted the eventual result from adopting the group’s proposals would be that free-to-air broadcasters controlled ‘future web TV services, where users can access the internet (sic) through a television set, as well as digital television’.\textsuperscript{54}

Surprisingly, the free-to-air representative body, the Federation of Australian Commercial Networks (FACTS), criticised the digital proposal.\textsuperscript{55} The free-to-air broadcasters claimed they needed exclusive use of free spectrum for 15 years to give them time to absorb simulcasting and other conversion costs. Regional commercial television broadcasters were especially unhappy and called for further concessions for the bush—no new entrants until transition had been completed, licence fee rebates and tax relief for infrastructure.

Multi channelling was another sticking point (see explanation in Box 4 below and in the Glossary). FACTS and the Australian Association of National Advertisers wanted access to this enhancement, as did the Australian Broadcasting Corporation (ABC). ASTRA, in contrast, was opposed to allowing free-to-air television broadcasters free spectrum to undermine one of pay television’s major selling points—viewer access to a number of channel options.

\textbf{Box 3: multi channelling}

\textbf{Multi channelling}

Digital television is able to use the same spectrum bandwidth that is used to transmit one analogue television channel to broadcast a number of digital channels (the number of extra channels depends on the content of the channels being transmitted).

The introduction of digital television in Australia meant therefore that broadcasters were given the technical capacity to transmit several channels simultaneously. That is, to multi channel.

One contemporary spectator summed up the debate in monetary terms. If the Government chose auction as the means of allocating the digital conversion spectrum, its return would be several billion


\textsuperscript{53} Ibid.

\textsuperscript{54} Ibid.

\textsuperscript{55} The Federation of Australian Commercial Networks (FACTS) is now known as Free TV Australia.
dollars in revenue initially. This could be augmented annually through licence fees.\(^5\)\(^6\) If it adopted
the ACMA recommendations it would be faced with costs of between one and two million dollars.\(^5\)\(^7\)

But setting the parameters for digital television was clearly about more than money. There were
broadcasting traditions to consider and these needed to be balanced with emerging arguments in
favour of a new competition-based regime to deal with the emergence of new communications
technologies. The view of Managing Director of SBS in 2003, Nigel Milan, while clearly phrased from
the perspective of a free-to-air broadcaster, is worth noting. In Milan’s view, the debate:

... centred on whether to open the tightly regulated market to investment from new players. If
not, then the question was: what incentives could be given to the incumbent broadcasters to
invest the estimated one billion dollars in infrastructure needed for the transition to digital? The
outcome has profoundly shaped digital broadcasting in Australia. While Pay TV digitisation has
been left to market forces, free-to-air terrestrial broadcasting by the public and commercial
broadcasters is heavily regulated. Commercial free-to-airs have received free spectrum for a
limited period, but in return have had to make significant investment and work within a complex
regulatory framework.\(^5\)\(^8\)

Getting started

Legislation

The initial digital conversion legislation introduced by the Howard Government in 1998 reflected
directions recommended by ACMA’s specialist group.\(^5\)\(^9\) In return for the loan of 7 MHz of spectrum,
free-to-air broadcasters were to simulcast existing services in analogue and digital format for eight
years. During that time, they were not to use digital spectrum for multi channelling or subscription
television and they were to broadcast a minimum amount of HD programming from the
commencement of digital transmission; this was to increase over time.\(^6\)\(^0\) Broadcasters that did not
comply with HD levels were to lose their loaned digital spectrum. Local content and closed
captioning requirements were to continue to apply.\(^6\)\(^1\)

\(^{56}\) Editorial, The Sydney Morning Herald 27 March 1998, quoted in R Kilmurray, Digital TV—last in space, Current issues
brief, 19, 1997–98, Department of the Parliamentary Library, Canberra, 1998, viewed 5 June 2009,

Kilmurray, op. cit.

\(^{58}\) N Milan, The digital age: the Australian digital TV experience, edited version of paper presented to ABU General
Assembly, Istanbul, October 2003, viewed 12 May 2009,

\(^{59}\) The Television Broadcasting Services (Digital Conversion) Act 1998, viewed 5 June,

\(^{60}\) The requirement was to commence at 20 hours per week.

\(^{61}\) Australian content on commercial television is regulated by mandatory standards which require commercial free-to-
air television licensees to broadcast an annual minimum transmission quota of 55 per cent Australian programming
between 6am and midnight. In addition, there are specific minimum annual sub-quotas for Australian (adult) drama,
ACMA was to develop conversion schemes for commercial and national broadcasting services and a Digital Channel Plan (DCP) was to determine channels allotted to broadcasters and the technical characteristics of those channels.\textsuperscript{62} The DCP would enable broadcasters to arrange digital transmissions to match analogue coverage during the conversion.\textsuperscript{63} Free-to-air broadcasters were to commence digital broadcasting in metropolitan areas by 1 January 2001 and in regional areas from that date onwards. All areas were to have terrestrial digital transmissions by 1 January 2004.

The legislation extended a ban on the establishment of new commercial broadcasting licences until December 2008. The Minister for Communications, Information Technology and the Arts, Richard Alston, was adamant retaining the ban was in the interests of broadcasting diversity. Moreover, it allowed the struggling community television sector to continue to use the channel that would have been allocated to a new licence.\textsuperscript{64}

The award of free spectrum and maintenance of the ban on a fourth commercial television licence has since been labelled by various sources as a concession to the long-time lobbying influence over broadcasting policy in Australia of powerful free-to-air broadcasters. These were the so called media moguls, represented in particular by the owner of the Nine Network, Kerry Packer.

Accommodating the needs of these moguls had long been seen by critics as a way to avoid ‘political retribution’ at election time.\textsuperscript{65} As one critic summarised it, formation of media policy had been influenced by media owners who were prepared to trade uncritical coverage for favourable policy decisions.\textsuperscript{66} In short, it was at times the case that maintaining media support was a crucial factor in losing or gaining government—a lesson not forgotten in framing early digital transition policy.

documentary and children’s programs. Closed captioning was required for all prime time programming as well as for news and current affairs broadcast outside prime time.

62. The Digital Channel Plan (DCP) was to consider a minimum of six digital television services—three free-to-air commercial services, the two national broadcasters and an additional channel.

63. The Commercial Conversion Scheme came into effect on gazettal, 9 June 1999 and the National Television Conversion Scheme following approval from the Minister for Communications, Information Technology and the Arts on 2 February 2000.

64. R Alston (Minister for Communications Information Technology and the Arts), \textit{Community broadcasting sector wins again}, media release, 24 December 1997, viewed 9 April, 2010, \url{http://www.dbcde.gov.au/Article/0,0,4_2,4008-4_10466,00.html} Community broadcasting is media produced by communities for communities. It is based on principles of: access and participation, volunteerism, diversity, independence and localism. The Australian community broadcasting sector is recognised internationally as one of the most successful examples of ‘grassroots’ media. Community broadcasting provides news, information, cultural content and entertainment to communities defined by geographical location or common interest. Discussion of community television and digital transition can be found in Appendix A.


Initiating the datacasting saga

In 1999, the Government had been advised of the potential of datacasting to deliver enhanced information services. As a result, it made concessions in digital legislation to allow free-to-air broadcasters to use the part of their loaned spectrum not taken up with broadcasting to provide these services. As a concession to others who may wish to experiment with datacasting, fees were imposed on the use of any loaned spectrum for these new services. Ostensibly, requiring all users of spectrum for this purpose to pay fees levelled the datacasting playing field. Given the generous assistance free-to-airs had already received, the sceptical considered it only fair that they paid for spectrum not used for television. In addition, it could be argued that without some form of accompanying incentives, (albeit not to suggest that they should be of the proportion the free-to-airs had received), to encourage datacasters to invest in developing the services, this legislative concession was effectively hollow. See Box 5 and the Glossary for a definition of datacasting services.

Box 4: datacasting

A datacasting service is defined in section 6(1) of the Broadcasting Services Act 1992 as a service which delivers content in the form of text, data, speech, music or other sounds, visual images or in any other form, or in any combination of forms, to persons having equipment appropriate for receiving that content.

Datacasters must use the broadcasting services bands to transmit information and education programs, parliamentary and court proceedings, text and still images, interactive computer games and Internet-style services, including electronic mail.

Datacasting licensees are not able to broadcast a range of material including: programs that are considered to be equivalent to television news, drama, sports, music, weather, documentary, lifestyle or entertainment programs, or commercial radio programs. They are allowed to transmit extracts of television programs if these are no longer than ten minutes or put together to constitute a single program.

In short, datacasting is the broadcast of multimedia or other data content using the transmission stream of a digital television service provider.

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67. M Long and C Winter, Development of datacasting technologies and services: report prepared for the Department of Communications, Information Technology and the Arts (DCITA), DCITA, Canberra, 1999, section 2.2.4.
68. The broadcasters were only to use spectrum excess to that used for digital transmission. Broadcasting spectrum not provided to the free-to-air broadcasters for digital conversion (including spare capacity which they may opt to use for datacasting) could be allocated on a competitive basis for the transmission of other datacasting services. Existing free-to-air broadcasters were not permitted to bid for this spectrum.
Preparation

During 1997, and in the first part of 1998, ACMA and the Government Communications Laboratory conducted field trials of the European DVB-T and the United States ATSC transmission systems and in June 1998, unanimously recommended that Australia adopt the DVB-T system. 69 It was noted:

Among the criteria assessed, the greatest weight was given to the ability to match existing coverage and to provide satisfactory interoperability with both the present analogue and other digital broadcasting services. Consumer products, and the availability of receivers capable of receiving a high definition service were also important factors. After ratification of the decision by the Department [of Communications, Information Technology and the Arts], full development of the detailed standards for Australian [terrestrial digital television] will now be progressed through industry and Standards Australia committees. Draft standards are expected to be completed before the end of 1998. 70

During the same period, a Senate Committee set about discovering whether the Australian broadcasting industry was adequately prepared for the arrival of digital television and what the cost of conversion would be for broadcasters and consumers. In submissions to the Committee, the national and commercial free-to-air broadcasters once again stressed the cost and considerable hardship they faced in moving to digital telecasts. The ABC argued that conversion would amount to $150 million over five years followed by ongoing costs of over $30 million per annum. FACTS considered that for the same period, commercial free-to-air broadcasters would need to spend between $500 and $750 million in capital expenditure. 71

Cost for consumers began to emerge as a factor which would necessarily affect digital transition. It was estimated that the outlay for a set top box could initially be as much as $500, although it was expected that this would fall in time to around $100. The costs of HDTV sets were also estimated to range from between $6000 and $8000. 72

For some, it was not about expense; there was no question the transition to digital was going to be costly for all parties; what needed to be assessed in the context was whether this equated fairly and reasonably with the grant of free spectrum use to certain broadcasters for eight years. One assessment asked:

70. Ibid.
72. FACTS submission, transcript of evidence, from Ms Bun and EMC Technology Forecast 1998 from Price Waterhouse, Senate inquiry, into Datacasting Charge (Imposition) Bill, op. cit.
Is there a public interest in locking out competition until 2008, particularly in this rapidly advancing technological climate? ... The government’s decision protects the capital investment of the [free-to-air broadcasters] digital transmission start-up costs. There is, nevertheless, a strong argument favouring a competition-based telecommunications legislative regime to be set in place to coincide with the introduction of digital television, an approach which would fall in line with the ‘spirit’ of the Trade Practices Act 1974. However, to properly consider this argument, the cost of digital transmission implementation must also be considered. Who will, or should, be left with the burden of infrastructure start-up costs? Equitable principles suggest that, to gain the benefit, one must first suffer the burden. Perhaps a flexible licensing and revenue mechanism is more appropriate. 73

So, in July 1998, following passage of the first digital legislation, it appeared no stakeholders were satisfied with progress towards digital transition. Jock Given, Director of the Communications Law Centre at the University of New South Wales, précised the various concerns:

... the commercial networks which get frequencies can’t use them to provide multi-channel TV services, because that would be competition for the Pay-TV business. And the new players which get frequencies for datacasting can’t use them for TV services, because that would be competition for the free-to-air TV business. Policy is made by keeping the warring commercial interests equally unhappy, rather than encouraging the creative exploration of the capabilities of a new and cost efficient technology to provide a flexible and interesting service mix. 74

Reviewing the situation

The 1998 legislation specified that a number of reviews on future directions for digital television and datacasting take place before 2000. The Government used the review process as the basis for finetuning the digital plan. This included making a commitment to introduce a definition of datacasting which it argued would afford more certainty about service scope and ensure it remained distinctly different from television services.

Fine tuning for free-to-air broadcasters was mostly positive. They were able to offer digital enhancements to their main simulcast programs if these were directly linked to main channel programs and broadcast as separate multi channel programs. 75 What came to be seen later as a downside was the imposition of ‘triplecasting’—the telecast of analogue signals, a standard definition digital signal at all times and a high definition signal (initially for 20 hours per week).

Despite fine tuning, a number of critics continued to label digital policy overall as a direct impediment to consumer uptake of digital television. One academic, Franco Papandrea, was also

73. Kilmurray, Digital TV—lost in space, op. cit.
75. Enhancements included enhanced camera angles or additional statistics or other information. R Alston (Minister for Communications, Information Technology and the Arts), Digital—new choices, better services for Australians, media release, 22 December 1999, viewed 11 January 2010, http://www.richardalston.dcita.gov.au/Article/0,,0_4-2_4008-4_14717,00.html
highly critical from the public interest perspective. Papandrea maintained that in fact the policy imposed ‘a very high opportunity cost on society for the promise of small and uncertain benefits’. 76

Keeping on course— despite the Productivity Commission

Broadcasting review

The Productivity Commission’s major inquiry into broadcasting in 1999, which sought to discover ways to improve competition and efficiency in the industry for the benefit of consumers, restated criticism of the digital policy framework. 77 The Commission singled out high definition policy for particular censure. It claimed firstly that the cost of HD equipment would inhibit broadcasters from investing in new services. Secondly, mandating high definition transmission, a ‘unique international standard’, would mean consumers may not benefit from the economies of scale that could result if Australian products mirrored those used in larger markets. Thirdly, and crucially, in the Commission’s estimation, high definition used spectrum which could be used for enhanced programming services. These were more likely than HD to be popular with consumers.

The Commission denounced as ‘prescriptive, artificial and inevitably short lived’ the distinctions imposed between datacasters and other digital broadcasters. 78 In its view, datacasters needed to be given the widest possible scope to test and respond to consumer tastes and demands. But, as journalist Alan Kohler later pointed out, datacasting had been defined in effect as anything that was boring to ensure that anything that was interesting or entertaining continued to appear only on free-to-air television. As a result, according to Kohler, as datacasting was supposed to have been the enticing extra that would have helped digital television take up, it would inevitably falter.

The Productivity Commission’s views and advice went largely unheeded, and in May 2000 legislation was introduced only to realise promises made in the Government’s December 1999 finetuning statement. 79

More finetuning and the ‘death’ of datacasting

Free-to-air broadcasters were supportive of the HD requirements introduced in the second round of legislation, but others stakeholders continued to voice concerns about the excessive cost imposed by mandating high definition. 80

78  Ibid.
Predictably, free-to-air broadcasters were in favour of regulation to distinguish between datacasting and broadcasting. Also predictably, the opposing view was that datacasters were unduly constrained under the legislation and that its driving force was protecting the interests of media mates.  

Despite some speculation that Labor and the Democrats would combine in the Senate to vote against the 2000 legislation on the datacasting issue, they could not reach agreement on what a new classification would be. The Democrats saw content as a legitimate basis for a definition of datacasting, but Labor disagreed, and so the narrow definition remained.

As a result, one industry commentator labelled the 2000 legislation as the ‘kiss of death’ for the datacasting industry.

**Momentous, revolutionary or just ‘damp squib’?**

**The launch**

During 2000, while there was no kiss of death for digital television, neither were there outpourings of enthusiasm for its approaching debut. Media commentator Crispin Hull reported:

> Australians have shown a remarkable propensity to take up new technology. Not so with digital TV. Consumers are showing little interest. Manufacturers are wary. The reason is that the Government has nobbled nearly all the benefits of digital television, just for the benefit of the existing three commercial broadcasters. Quite rightly, consumers will not buy digital television sets or digital television converters until they get value for money, and that cannot happen until the Government admits it got it wrong and changes the legislation.

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83. P Coroneos, Executive Director, Internet Industry Association, quoted in G Barker, ‘Canberra accused of caving in to TV moguls’, *The Age*, 20 June 2000, viewed 12 April 2010, [http://parlinfo/parlinfo/download/media/pressclp/YXR16/upload_binary/yxr165.pdf?fileType=application/pdf#search=%22Canberra%20accused%20of%20caving%20in%20to%20TV%20MOGULS%22](http://parlinfo/parlinfo/download/media/pressclp/YXR16/upload_binary/yxr165.pdf?fileType=application/pdf#search=%22Canberra%20accused%20of%20caving%20in%20to%20TV%20MOGULS%22)

84. The sub title of this section refers to a comment made by P Courtney, ‘Does anyone care about digital television?’ 7.30 Report transcript, ABC, 2 January 2001, viewed 12 April 2010, [http://www.abc.net.au/7.30/stories/s229316.htm](http://www.abc.net.au/7.30/stories/s229316.htm)

When digital telecasts began with little fanfare in the five major mainland capitals on 1 January 2001, few people had been enthusiastic enough to purchase a set top box. Indeed, those interested in spending around $700, had found it difficult to do so. Moreover, it was impossible for viewers to purchase integrated receivers, as none were available on the market. There was more animated response about the possibility digital transmission would cause interference with existing channels in some areas, or problems with VCRs or video games consoles.

The Government did not appear concerned about the poor reception for digital; a spokesperson for Minister Alston remarking only that the digital transition would not happen overnight. Labor attempted to gain political points by describing digital television as a victim of ‘botched policy and botched implementation’. Advice from the Australian Consumers Association perhaps said it most tellingly—viewers should sit tight and do nothing for the time being.

Getting on with it regardless

Nevertheless, it was at last the digital television age and the wheels of transition began to turn, albeit slowly. In July 2001, after consultation with the broadcasting industry, ACMA determined simulcast start dates for a number of regional areas. Regional broadcasters could use some of the funding provided in the 2000 Budget to begin transmissions earlier than the commencement of formal simulcasting, however.

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89. Ibid.

90. Ibid.

91. Note: ‘regional’ did not include remote area television licence areas. It had been recognised in the 1998 legislation that the transition to digital broadcasting in remote areas would need to be undertaken using unique conversion parameters. These were put in place under Part B of the Commercial Television Conversion Scheme which directs ACMA to consider the special circumstances that apply to the transmission of television in these areas. More discussion of how different treatment of remote licence areas has been reflected in legislation can be found for example, in J Chowns, Broadcasting Legislation Amendment Bill (No. 1), Bills digest, no. 26, 2005–06, Parliamentary Library, Canberra, 2005, viewed 8 July 2010, http://www.aph.gov.au/library/pubs/bd/2005-06/06bd026.pdf and R Jolly and P Pyburne, Broadcasting Legislation Amendment (Digital Television) Bill 2010, Bills digest no. 145, 2009–10, Parliamentary Library, Canberra, 2010, viewed 9 July 2010, http://www.aph.gov.au/library/pubs/bd/2009-10/10bd145.pdf as well as in the ‘Black spots and satelliteconversion’ section of this paper.

92. ABA Update, December 2001/January 2002. Assistance was in the form of licence rebates for commercial broadcasters. Funding assistance was $260 million over 13 years.
The Productivity Commission had noted that a delayed start time for simulcast in regional areas would give broadcasters in these areas more time to plan for new services and to take advantage of cheaper equipment. At the same time, the Commission warned that this flexibility would result in delays in the release of spectrum and increased transmission costs. Regional operator Southern Cross Broadcasting indeed blamed the high cost of conversion and the inadequacy of government subsidies for the closure of news units in five regional areas in 2001. The Government responded to the closures by threatening to withdraw transition funding available to Southern Cross.

More legislative tinkering, slow take up and what to do next

Following the Coalition’s 2001 election victory, the HD quota requirement was relaxed to allow it to be delivered on an annual basis, and for advertising time to count towards quota obligations. Deadline for quota commencement was extended to 1 July 2003. Labor spokesperson, Lindsay Tanner, argued these changes illustrated once again that digital transition policy was a ‘shambles’. Tanner maintained that annualised quotas would not guarantee the broadcast of regular HD content and including advertising would result in foreign advertisements dominating what content was

94. The units were in Alice Springs, Canberra, Cairns, Darwin and Townsville. Southern Cross also operated radio stations in metropolitan areas. M Gilchrist, S Brook and S Emerson, ‘Regional TV news blackout’, The Australian, 22 November 2001, viewed 8 February 2010, http://parlinfo/parlinfo/download/media/pressclp/54H56/upload_binary/54h564.pdf;fileType=application/pdf#search=%22regional%20TV%20news%20blackout%22
95. L Doherty, ‘TV dollars at risk after bush services axed’, The Sydney Morning Herald, 29 November 2001, viewed 8 February 2010, http://parlinfo/parlinfo/download/media/pressclp/DSI56/upload_binary/dsi5613.pdf;fileType=application/pdf#search=%22TV%20dollars%20at%20risk%20after%20bush%20services%20axed%22 At the time, ACMA was conducting an inquiry into the adequacy of local news and information programs in the bush after Prime TV had reduced services in June 2001. It released a report in August 2002 which dealt with the four mainland aggregated television markets of Regional Queensland, Northern New South Wales, Southern New South Wales and Regional Victoria. Australian Broadcasting Authority (ABA) Adequacy of local news and information programs on commercial television services in regional Queensland, northern NSW, southern NSW and regional Victoria (aggregated markets A,B,C and D), ABA, Sydney, 2002. A second report, released in June 2004, examined the remaining regional and rural licence areas in Australia—the solus operator and two operator markets. ABA, Adequacy of local news and information programs on commercial television broadcasting services in regional and rural Australia (solus operator and two operator markets), ABA, Sydney, 2004.
96. R Alston (Minister for Communications, Information Technology and the Arts), Commencement of high definition quota, media release, 27 August 2002, viewed 13 April 2010, http://parlinfo/parlinfo/download/media/pressrel/O4A76/upload_binary/o4a761.pdf;fileType=application%2Fpdf#search=%22commencement%20of%20high%20definition%20quota%22 Note: the requirement to provide HDTV transmissions applied in mainland state capitals from 1 July 2003 and in regional areas it was to begin two years after simulcast of analogue and digital services were required to commence in a particular area.
97. L Tanner (Shadow Minister for Communications), High-def digital TV shambles unfolds, media release, 11 December 2002, viewed 13 April 2010, http://parlinfo/parlinfo/download/media/pressrel/P8586/upload_binary/p85861.pdf;fileType=application%2Fpdf#search=%22high%20def%20digital%20tv%20shambles%20unfolds%22
shown.\textsuperscript{98} Labor demanded postponement of the quota requirements and reconsideration of HD issues.\textsuperscript{99}

Not surprisingly, the Government rejected Labor’s proposal, but at the same time, there was some indication that Minister Alston was having second thoughts about the effectiveness of certain aspects of digital transition policy. In April 2002, a leaked Cabinet submission indicated that the Minister favoured abandoning HD quotas and giving free-to-air networks the opportunity to multi channel. The Prime Minister reportedly distanced himself from any suggestion that change was being considered and some journalists implied this was because he feared the substantial opposition it may elicit from media mates.\textsuperscript{100}

What was particularly interesting in light of Alston’s proposal was that it revealed that the free-to-air broadcasters had differing opinions on what benefits multi channelling could deliver. Seven was enthusiastic about the idea, Nine opposed it and Ten was in favour of some form of subscription multi channelling.\textsuperscript{101}

Whether it amounted to changing multi channelling rules, or some other incentive, it was clear something needed to be done to spark more interest in digital television. In 1999, the Department of Communications, Information Technology and the Arts had made the astute observation that digital broadcasting would be determined by two key factors: whether convenient and reasonably priced reception devices were obtainable, and the extent to which individuals valued the services that were available.\textsuperscript{102} These two points were not as prominent in the development of digital policy as they perhaps should have been at the time. But by early 2002, their importance was apparent. The cost of digital television was a prohibitive factor in the take up of digital television and the majority of viewers were not convinced of its value.

The \textit{Business Review Weekly} in fact labelled digital television a flop, as only around 2000 set top boxes had been sold. This amounted only to 0.015 per cent of the 13 million television sets in

\textsuperscript{98} Ibid.
\textsuperscript{99} L Tanner (Shadow Minister for Communications), \textit{Government should suspend high definition television requirement} media release, 1 May 2002, viewed 13 April 2010, http://parlinfo/parlinfo/download/media/pressrel/RQF66/upload_binary/rqf661.pdf?fileType=application%2Fpdf#search=%22Government%20should%20suspend%20high%20definition%20television%20requirement%22 Note: clause 60A of Schedule 4 of the BSA required that a review of the operation of the HDTV quota was to be completed by 1 January 2004. The Government proposed to delay the review until July 2005.
\textsuperscript{102} DCITA, Digital Broadcasting Industry Action Agenda, \textit{Australian industry: ‘Thinking outside the box’}, DCITA, January 1999, p. 4.
Australian homes.\(^{103}\) Between 20,000 and 30,000 had been sold by September 2002, according to industry sources, but given that approximately one million television sets were sold annually in Australia, this number seemed insignificant.\(^{104}\)

In the following months, prohibitive cost, combined with accusations about poorly thought out protectionist policy which only benefited commercial broadcasters, continued to be proffered as the principal reasons Australians had not embraced digital television. (See an example of the extremes to which some media commentators went at various times to make their points, in the Alston, Howard and the ‘yuk’ test section latter in this paper). A number of solutions were advanced to deal with the cost issue, including introducing a common set top box for both free-to-air and subscription television. This suggestion was immediately rejected by pay television operators, most likely because they saw it as providing yet another advantage to free-to-air operators.\(^{105}\) Minister Alston was opposed to the suggestion as it would force people who did not subscribe to pay television to purchase equipment they would not be able to use.\(^{106}\)

**Flogging the dead datacasting horse?**

After an auction of datacasting licences was postponed in 2001 when potential operators withdrew their expressions of interest, citing the overly onerous restrictions, the Government promised to review the regulations.\(^{107}\) Its 2002 review consistently heard that the television licence moratorium needed to be removed and price-based allocation of datacasting abandoned if the industry was not to be hamstrung.\(^{108}\) Yet again the Government rejected changes, citing the immaturity of the industry, investment costs and a lack of markets for digital services.\(^{109}\)

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109. Sections 17 and 18 of the *Broadcasting Services Act 1992* define narrowcasting services as broadcasting services whose reception is limited by: being targeted to special interest groups; intended only for limited locations; provided during a limited period of time; because they provide programs of limited appeal or for some other reason. Narrowcasting services operate under a broadcasting class licence regime, with minimum levels of regulation. Subscription narrowcasting services differ from open narrowcasting services in that they are made available only on payment of subscription fees.
Box 5: Alston, Howard and the ‘yuk’ test

**Alston, Howard and the ‘yuk test’**

The media appeared to grasp every opportunity to emphasise arguments about the prohibitive cost of digital television and consequent low take up rates for the technology. At times, the digital issue also became entangled with others; in one case, with the Government’s plans to privatise Telstra. Both the Prime Minister and Minister Alston were criticised following a revelation that Telstra had given them free use of television sets that would have retailed at around $10 000 each, so they could familiarise themselves with the benefits of digital.¹¹⁰

Reports took the line that ordinary people were not so privileged. They had to be content with experiencing wide screen digital at their local pub or electrical goods store.

In February 2003, journalist Terry McCrann claimed the borrowed sets incident indicated that Government policy had failed the ‘yuk test’; that is, in McCrann’s view, it illustrated the failure of policy which required people to purchase expensive sets before they could enjoy the digital experience.¹¹¹

**Australian Competition and Consumer Commission (ACCC) appraisal**

In 2003 the Australian Competition and Consumer Commission (ACCC) was blunt in its assessment of the digital state of affairs. It declared multi channelling limitations, restrictions on entry to free-to-air

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¹¹¹ T McCrann, ‘Alston’s TV policy failed the “yuk test”’, *The Daily Telegraph*, 20 February 2003, p. 43, viewed 14 April 2010, [http://parlinfo.parlinfo/download/media/pressclp/F8I86/upload_binary/f8i865.pdf?fileType=application%2Fpdf#search=%22digital%20television%22](http://parlinfo.parlinfo/download/media/pressclp/F8I86/upload_binary/f8i865.pdf?fileType=application%2Fpdf#search=%22digital%20television%22) Note: there was also some implication that the incident had compromised the Minister in his dealings with Telstra and that he had contravened the Ministerial code of conduct.
broadcasting and datacasting licence conditions detrimental to the communications market. It called for technologies to be synchronised and consumer choice, competition and innovation promoted.\textsuperscript{112}

The ACCC’s analysis was a refreshing change in the debate as it did not see multi channelling and HD television as mutually exclusive. Multi channelling could be possible during the time broadcasters did not provide HD services. Similarly, allowing free-to-air broadcasters to multi channel could help them make better use of expensive broadcasting rights, and in turn, deliver greater consumer choice. Moreover, the ACCC was clearly sceptical of arguments that multi channelling fragmented audiences and concluded:

No persuasive evidence has been presented to date to indicate that removing the prohibition on multi-channelling would harm the [free-to-air] sector. The easing of the restrictions on multi-channelling would provide [free-to-air] operators with the ability to offer new services to consumers and has the potential to provide a wider range of services to consumers.\textsuperscript{113}

With regards to datacasting, the ACCC added its criticism to that of many others. Existing restrictions discouraged innovation and denied datacasters the opportunity to explore consumer tastes and demand. They needed to be removed.

The ACCC’s bottom line was critical of the protective nature of the free-to-air commercial television regulatory regime. It called for less restriction so as to allow competitive forces to determine which broadcasters survive in the market place.\textsuperscript{114}

Following the release of the ACCC review, Daryl Williams, who had replaced Richard Alston as Communications Minister in October 2003, indicated the Government would review digital television policy in general.\textsuperscript{115} It was most likely this promise was prompted more by poor digital sales figures than in response to the ACCC’s concerns, however. Despite an increase in sales of digital equipment during the year, the vast majority of Australia’s 17 million television sets remained firmly analogue. This made a proposed 2008 switch off date appear increasingly optimistic. It led Williams to speculate that a possible solution may be to force people to purchase digital sets by setting a date beyond which retailers would not be allowed to sell analogue televisions.\textsuperscript{116}


\textsuperscript{113} Ibid.

\textsuperscript{114} Ibid. Submission to the Productivity Commission’s inquiry into broadcasting, August 1999, p. 1, quoted in ACCC, Emerging market structures in the communications sector, op. cit.


\textsuperscript{116} Ibid. Note: a similar solution had been adopted by the United States in its switchover phase.
Box 6: ABC, kids and digital

Poor response to digital television was problematic for the ABC, which had launched the multi channels, ABC Kids and Fly in 2001. In its triennial funding submission in 2003 the ABC called for an extra $17 million to develop and fund digital and to maintain these channels. In May 2003, following rejection of the request for extra funding by the Government, the national broadcaster announced it would be forced to close the channels.

The Government claimed it was not to blame for the closure as the ABC had of its ‘own volition’ made the funding decision. It claimed further that while it had not committed to providing extra money to maintain the channels, it had maintained the level of ABC funding in real terms since their launch. It accused the ABC of ineffective forward planning which had funded the multi channels from one-off savings. As there had been no commitment given to ongoing funding, it was incumbent on the ABC to identify ongoing cost savings to finance the channels.

Closure of the ABC channels was seen by some as working against the Government’s plans to seduce sceptical Australian audiences to switch to digital television. Interestingly, given the support for multi channelling as a driver of digital uptake in some quarters, other sources saw the closure as irrelevant. According to this assessment, viewers wanted better pictures, not more channels.

Commentator Crispin Hull once again took the opportunity to criticise the Government’s overall policy on digital television while remarking that the closure was a ‘smart bit of politics’ by the ABC. According to Hull, the action would not save a significant amount of money for the national broadcaster, but it would ‘make voters squeal’.

118. L Tanna (Shadow Minister for Communications), Government digital disaster as ABC cuts ABC Kids and Fly TV, media release, 26 May 2003, viewed 28 June 2010, http://parlinfo/parlinfo/download/media/pressrel/COF96/upload_binary/cof963.pdf;fileType=application%2Fpdf#search=%22digital%20television%22
119. R Alston (Minister for Communications, Information Technology and the Arts), ABC’s multichanneling decision, media release, 26 May 2003, viewed 28 June 2010, http://parlinfo/parlinfo/download/media/pressrel/U0G96/upload_binary/u0g962.pdf;fileType=application%2Fpdf#search=%22digital%20television%22
In March 2005, the ABC once more launched a digital channel—ABC2—with $2 million funding. The channel consisted originally of time shifted programming. Labor’s spokesperson on broadcasting, Senator Stephen Conroy, was critical of the poor funding allocated to the channel but the Government continued to argue that it was up to the Corporation to decide what funding it would allocate.\(^{123}\)

In May 2005, complaints were made by Kerry Packer’s Publishing and Broadcasting Limited and the pay television industry that ABC was televising programs, including news and sports programs, which breached government genre restrictions. Pay television was particularly critical given that anti siphoning restrictions prevented it from showing a number of popular sporting events.\(^{124}\) In response, the ABC argued it had not breached the restrictions but that they should be removed as it was ‘incomprehensible’ that the national broadcaster should not be able to show news and current affairs on its second channel and that removal of restrictions would help encourage viewers to adopt digital television.\(^{125}\)

Genre restrictions on ABC 2 programming were lifted as part of the Howard Government’s 2006 media reform package.

In December 2009, following the injection of $167 million in extra funding for the national broadcaster by the Rudd Government, the ABC launched ABC 3, which broadcasts children’s programs nationally. ABC 3 was promoted as an incentive for families to convert to digital technology.

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Note: the closure of the ABC’s multi channels at this time should also be seen in the context of Minister Alston’s accusations of bias against the national broadcaster in relation to its reporting of the war in Iraq. These resulted in investigations which upheld a number of the Senator’s complaints, but concluded also that overall, the ABC coverage of the war was ‘competent and balanced’. Alston’s allegations drew criticism that he had embarked on a vendetta against the ABC. The final report on this matter was undertaken by the ABA. ABA, *Coverage of the Iraq War by ABC AM, ABA*, Sydney, August 2004, viewed 28 June 2010,


124. For more information on anti siphoning, R Jolly, *Sport on Television: to siphon or not to siphon?*, Research paper no. 14, 2009–10, Parliamentary Library, Canberra, 2010, viewed 20 April 2010,


http://parlinfo.parlinfo.gov.au/download/media/pressclp/X34G6/upload_binary/x34g63.pdf;fileType=application%2Fpdf#search=%22coonan%20may%20broaden%20abc%202’s%20horizons%22
Inquiries, inquiries everywhere

‘Thematic’ inquiries

Between 2004 and February 2006, in an effort to find out which parts of the digital television regulatory framework needed the most modification, the Government directed the Department of Communications, Information Technology and the Arts to conduct a series of reviews. Issues papers for the reviews featured ‘thematic’ perspectives: restrictions on additional programming, the moratorium on new commercial broadcast licences and datacasting licences, allocation of spectrum, underserved television markets, high definition requirements and duration of the digital simulcast period.126

Findings from all reviews, except the duration of the simulcast period, were released in February 2006. Most conclusions were notable in that they were brief, restated ongoing issues and provided little indication about whether the Government intended to embark on new policy directions.127 The review of the moratorium on new television licences, for example, restated the views of free-to-air broadcasters that a fourth commercial licence would fragment their viewing audience and limit funding they had to produce quality Australian programs.128 Key arguments in support of a new licence were similarly restated—it would enhance program diversity and increase productivity in the sector.129 Datacasting issues appeared almost as an afterthought in this review.

The review of HDTV on the other hand, found that it was becoming more accepted. Some stakeholders were cautiously positive and acknowledged it may be a means to drive digital uptake. Others were more enthusiastic and considered it would certainly be a factor as prices of equipment fell and more HD content became available.130 In the same vein, the Government appeared to be beginning to accept the inevitability that multi channelling could be a significant factor in promoting digital take up and that existing rules needed to be reassessed.131

127. Note: submissions to these reviews appear to be no longer publicly available but news reports suggest that there were few issues raised that had not already been discussed at length.
128. ‘Report on the review of the provision of commercial television broadcasting services after 31 December 2006’ in DCITA, Reports on reviews of the digital television regulatory framework, op. cit.
129. Ibid.
131. ‘Report on the review of the provision of services other than simulcasting by free-to-air broadcasters on digital spectrum’, in DCITA, Reports on reviews of the digital television regulatory framework, op. cit.
**House of Representatives Inquiry**

Release of a House of Representatives Inquiry report into digital television coincided with publication of the thematic reviews.\(^{132}\) This report affirmed what everyone already surmised—digital take up remained low. According to Digital Broadcasting Australia figures, in September 2005, only approximately 985 000 Australian homes (or 13 per cent of Australian television homes), had free-to-air digital capability.\(^{133}\)

The inquiry heard a variety of explanations for low take up. The free-to-air broadcasters’ lobby organisation, FreeTV, claimed lack of equipment and coverage made it difficult to promote the benefits of digital to consumers.\(^{134}\) According to the Media Entertainment and Arts Alliance, enhanced picture and sound quality gained from digital television were also insufficient motivation to purchase digital equipment.\(^{135}\) Manufacturer LG was convinced that there had not been a concerted effort ‘in a highly technical area’ to make consumers aware of digital television (note: comment in the cartoon shown below seems to suggest that others agreed with the LG view).

**One view of digital television technology**


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134. Free TV Australia, submission no. 31, p. 9, *Digital television: who’s buying it?* op. cit.
135. Media and Entertainment Arts Alliance, submission no.58, *Digital television: who’s buying it?* op. cit.
The Inquiry was notable in that marked disagreement among the free-to-air broadcasters surfaced. On the issue of content as an incentive for take up, the Seven Network concurred with media commentators like Crispin Hull, who had consistently argued variety of content was the key to encouraging consumer interest in digital television. Hull noted that if the Government had allowed networks to broadcast more program streams, people would:

... have flocked to digital. We would have had a choice of 15 programs instead of five. A new TV set would have been worth getting. 137

Further, Seven cited a consumer survey which showed ‘overwhelming interest in greater choice and diversity of services’ and the ABC and SBS added that distinctive and innovative multi channels could not only enhance viewer choice, but also address unmet audience demand. 138

The Nine and Ten Networks disagreed. They considered increased viewer choice would result in poor quality programming and impose extra costs on broadcasters. 139 According to Nine, there was limited or no additional advertising revenue to fund new channels and limited resources to produce new programs or purchase quality programming. Moreover, in Nine’s view, any new channels would be likely to contain little, or no new programming, as was the case with subscription television. 140 In light of this argument, Network Seven’s case that subscription multi channelling by free-to-air broadcasters would represent a solution to the problem of lack of new or diverse content appeared strange. 141

The networks also had opposing views on HD as a means to drive digital take up. Nine and Ten believed an increase in the HD quota would have a positive effect. 142 The ABC saw HD quotas simply as a hindrance to using spectrum to deliver additional multi channel and interactive services content. 143

Despite being given the ‘kiss of death’ in 2000, datacasting was the subject of much discussion. Channel Ten labelled it yesterday’s technology and sought to have spectrum reallocated to establish a new digital terrestrial subscription platform. 144 FreeTV supported existing limitations as an effective mechanism to ensure that datacasting did not become a de facto fourth broadcasting network. 145 The Community Broadcasting sector expressed concern that the failure of a viable

138 Seven Network submission no.49, Digital television: who’s buying it? op. cit.
140 Ibid.
141 Seven Network submission, Digital television: who’s buying it? op. cit.
142 Network Ten, submission no. 60 and Nine Network submission, Digital television: who’s buying it? op. cit.
143 ABC, submission no. 45, pp. 2 and 9, Digital television: who’s buying it? op. cit.
144 Network Ten, submission, Digital television: who’s buying it? op. cit.
145 Free TV Australia, submission, Digital television: who’s buying it? op. cit.
business model for datacasting to emerge put digital transmission options for its own future in jeopardy.\textsuperscript{146}

Regardless of the arguments about availability, content, HD and the potential of interactive services, the absolute bottom line with regards to digital television take up was still cost. As had been reported in May 2005, the cost of digital television was prohibitive—ranging from $1300 to $20 000.\textsuperscript{147} Cost of course represented a ‘catch 22’—the price of digital equipment was not going to fall dramatically until the number of units sold increased noticeably. Moreover, while costs remained high, consumers were content to forgo the digital television experience.

### Media reform package

The period of concentrated review of digital television and a continued barrage of media criticism that accompanied it, confirmed what lack of viewer enthusiasm had been indicating, digital television was not an overwhelming success.

The answer to this digital dilemma, according to Senator Helen Coonan, who had replaced Daryl Williams as Minister in 2004, would be found in a March 2006 paper which put forward new proposals and outlined preferred new transition options.\textsuperscript{148} The paper also placed digital television in the context of the Howard Government’s longstanding commitment to reforming media ownership laws.\textsuperscript{149} Consequently, when a media reform package was introduced into the Senate in mid September 2006 it contained legislative changes intended ‘to provide additional digital services to consumers and help digital take up’.\textsuperscript{150}

The digital changes:

- removed genre restrictions previously imposed on the ABC and SBS multi channels
- allowed commercial television licensees to provide a non-simulcast HD channel from 1 January 2007, a standard definition multi channel from 1 January 2009 and any number of multi channels at the conclusion of the simulcast period
- removed the HDTV quota at the end of the simulcast period, and

\textsuperscript{146} Community Broadcasting Association of Australia (CBAA), submission no. 84, Digital television: who’s buying it? op. cit. Community television expressed this concern as a result of a Government’s suggestion that a datacasting service would be obliged to carry community television.

\textsuperscript{147} D Adams, ‘Do not adjust your set’, The Age, 19 May 2005, p. 1, viewed 8 February 2010, \url{http://parlinfo/parlInfo/download/media/pressclp/6p2G6/upload_binary/6p2g64.pdf;fileType=application%2Fpdf#search=%22going%20digital%22}


Other matters that would have an impact on the way in which digital television would evolve were dealt with in the legislation. Controversial anti siphoning regulations were modified to allow listed sporting events to be shown on a SDTV or HDTV channel if they had first been shown, or were being shown simultaneously on a broadcaster’s main channel.\footnote{152}

The legislation fulfilled a 2004 election commitment to restrict ACMA’s powers to allocate new commercial television licences within the Broadcasting Services Bands (BSB). Allocation of commercial television licences for services which would operate outside the BSB when the moratorium on new commercial licences ended in 2007 was also made subject to Ministerial approval.\footnote{153} It could be speculated that the motivation behind this change was the Government was unprepared to entrust the media regulator with decisions which could impinge on the operations of existing broadcasters, or to accept the consequences of such decisions.

As could be expected, the various arms of the media were divided on the merits of the proposed reforms. Pay television operator, News Limited, believed the package would continue to protect a free-to-air broadcaster oligopoly. Free-to-air broadcasters, especially Publishing and Broadcasting Limited (PBL, owner of the Nine Network) were generally supportive, although they expressed some reservations.\footnote{154} In short, as one media commentator remarked: anticipating what each sector of the media would say about reform was a matter of understanding where each might win or lose.\footnote{155}


\footnotesize{\textit{\textsuperscript{152} An anti siphoning regime in general prevents certain televised events, which have been listed by government, from being appropriated or ‘siphoned off’ by pay television operators so that only those that subscribe to a pay service are able to view the events. Under the Australian anti siphoning scheme, pay television licensees are unable to acquire rights to televise listed events on pay television until rights have first been acquired by the Australian Broadcasting Corporation (ABC), the Special Broadcasting Service (SBS) or commercial free-to-air broadcasters who reach more than 50 per cent of the Australian population. Section 115 of the \textit{Broadcasting Services Act 1992} (the BSA) details the Australian anti siphoning rules. The \textit{Broadcasting Legislation Amendment (Digital Television) Act 2006} also required that a review of the anti siphoning scheme take place before 31 December 2009. For more information on the Australian anti siphoning scheme see Jolly, \textit{Sport on Television,} op. cit.}\footnotesize

\footnotesize{\textit{\textsuperscript{153} Broadcasting Services Bands are the designated parts of the radio frequency spectrum which have been referred to the ACMA for planning under section 31 of the \textit{Radiocommunications Act 1992. See Glossary for more detail.}}\footnotesize

\footnotesize{\textit{\textsuperscript{154} Publishing and Broadcasting for example would have preferred to see all media regulation removed, but certain restrictions were retained in the final package, such as those to preserve a modicum of media diversity, particularly in regional licence areas. For more discussion see R Jolly, \textit{Broadcasting Services Amendment (Media Ownership) Bill 2006,} Bills digest, no. 32, 2006–07, Parliamentary Library, Canberra, 2006, viewed 20 April 2010,}\hfill http://www.aph.gov.au/library/pubs/bd/2006-07/07bd032.pdf\hfill \textit{155} M Stevens ‘No genuflecting to the Coonan canon on media’, \textit{The Weekend Australian,} 17 June 2006, p. 32, viewed 20 April 2010,}\hfill http://parlinfo/parlInfo/download/media/pressclp/CPZJ6/upload_binary/cpzj63.pdf;fileType=application%2Fpdf#search=%22media%20reform%22}
After much debate, many threats, and some compromises, on 18 October 2006, the media reform package was passed by Federal Parliament.

Ready, get set, but not quite go

One month later, Senator Coonan outlined the promised digital roadmap; her ‘Digital Action Plan’. The plan reset the conversion process timetable to commence in 2010–12, justifying delay in the context of the experience of other countries which had been forced to revise original switchover dates.156 Not unexpectedly, the plan presented a positive assessment of the Government’s digital achievements. Approximately 85 per cent of the Australian population was able to access digital services from local free-to-air sources and digital take up was almost 30 per cent.157

At the same time, Coonan’s document acknowledged that digital transition needed to be accelerated urgently to alleviate costs resulting from simulcasting programs and the inefficient use of spectrum that entailed. Further the plan noted that unless conversion sped up, as other countries completed transition, Australia may no longer be able to purchase analogue transmission and reception equipment or analogue programming.158

So the plan was that government investment in the conversion process, which had already provided funding to the ABC, SBS and regional broadcasters for digital transmission, would be enhanced.159 In addition, Digital Australia (DA) would be established to coordinate and oversee further transition and work with an industry body on implementation issues. DA’s work would complement ACMA technical research into factors impeding digital take up, as well as issues associated with the return of analogue spectrum at the end of the simulcast period—the so called ‘digital dividend’.

The Opposition claimed none of the proposals would drive digital take up. According to Labor spokesperson, Lindsay Tanner:

There is no money for the creation of new digital content to encourage consumers to invest in the equipment and there is no money to ensure that the poor and disadvantaged won’t be left staring at blank screens when analog [sic] TV is switched off.160

Channels A and B

The media reform package and Coonan’s revised transition plans added a further complication to the transition process—Channels A and B. Spectrum for these datacasting transmission services was

158. DCITA, Ready, get set, go digital, op. cit.
159. It was expected that by 2010 the Government would have invested more than $1 billion to ensure the national broadcasters could replicate their analogue coverage in digital and $250 million in assisting commercial broadcasters.
due to become available as a result of amendments to the *Radiocommunications Act 1992* and the end of trials of datacasting services which were supposed to be completed at the end of 2006. Spectrum used in these trials was therefore potentially vacant for use by Channel A to provide a free-to-air digital only service to domestic television receivers and Channel B to deliver television content over hand-held mobile television devices. Free-to-air commercial networks were initially to be excluded from bidding for the channels, but ‘frenetic lobbying’ led to a ‘backflip’ which entitled them and Foxtel to bid for ownership of Channel B.\(^{162}\)

It was offensive, according to one commentator, that Minister Coonan presented this policy as a win for consumers:

> The networks already have too much spectrum and power and too little competition. That's the major reason why at least a decade after the Government first started trying to develop a policy that brought Australia into the digital age, it is still deferring the starting date while other nations have entered it.

> With nothing in the revised package for anyone but the networks, why would anyone support the proposed abolition of [media] ownership rules that, however anachronistic they might be in a digital age, protect the fragile diversity of the established media today?

> Unless there are new entrants, new competitors and new and compelling content, where is the trade-off for less diversity of ownership and content?

> Under the Government’s ‘reforms’ there is none. That makes them not just dreadful but dangerous policy.\(^{163}\)

In reply to this type of criticism, Senator Coonan argued that selling the Channel A and B licences would be crucial in accelerating digital switch over and any objections to expanding the pool of bidders for the channels was short sighted.\(^{164}\) This view appeared to be in contrast with earlier datacasting policy which had erected a number of barriers to discourage the entry of new participants.

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161. Note: mobile television does not mean vehicle borne mobile television receivers which are used, for example, on buses in places like Hong Kong and Singapore. Mobile television means television watched on a small hand held device. See more information at: H Cheong, *ntl pioneers mobile digital TV on Singapore buses*, viewed 18 August 2010, [http://www.broadcastpapers.com/whitepapers/NTLmobileBus.pdf?CFID=18740626&CFTOKEN=2db0c020c112b927-821C8DA2-E9D2-B7DD-A2214E95C4D22784](http://www.broadcastpapers.com/whitepapers/NTLmobileBus.pdf?CFID=18740626&CFTOKEN=2db0c020c112b927-821C8DA2-E9D2-B7DD-A2214E95C4D22784)

162. S Bartholomeusz, ‘Coonan surrenders keys to digital age’, *The Sydney Morning Herald*, 14 September 2006, p. 22, viewed 6 July 2010, [http://parlinfo/parlInfo/download/media/pressclp/R6VK6/upload_binary/r6vk64.pdf;fileType=application%2Fpdf#search=%22channel%20a%22](http://parlinfo/parlInfo/download/media/pressclp/R6VK6/upload_binary/r6vk64.pdf;fileType=application%2Fpdf#search=%22channel%20a%22)

163. Ibid.

164. J Schulze, ‘Coonan denies free-TV bias’, *The Australian*, 18 September 2006, p. 26, viewed 9 July 2010, [http://parlinfo/parlInfo/download/media/pressclp/O8WK6/upload_binary/o8wk64.pdf;fileType=application%2Fpdf#search=%22channel%20a%22](http://parlinfo/parlInfo/download/media/pressclp/O8WK6/upload_binary/o8wk64.pdf;fileType=application%2Fpdf#search=%22channel%20a%22)
The Channel A and B discussion reflected wider concerns about the extent to which the 2006 media reform package would deliver diversity, but despite many objections from this perspective, as noted earlier in this paper, it passed both Houses of Parliament in late 2006. 165

Telecommunications analyst, Paul Budde, made the point soon after that sales of the A and B licences could provide an opportunity for exciting new services to emerge and could amount to hundreds of millions of dollars, depending on what the Government decided could be done with the spectrum. 166

There appeared to be a high level of interest in using the Channel B licence for mobile television, James Packer for one indicating that PBL could make a bid for Channel B in partnership with Foxtel. 167 Fairfax media was also reportedly interested in the licence, although it was also suggested that the interest was in fact a ruse to cover a plan to enter the metropolitan television market once the Channel A licensee sought content for its various channels. 168

Auction plans for the A and B spectrum hit a ‘pothole’ when free-to-air broadcasters argued Channel B spectrum would cause interference with existing analogue transmissions if used for mobile television (Digital Video Broadcast Handheld (DVBH)). 169 In response, the pay television industry saw the free-to-air concerns as ‘a smokescreen’ which free-to-air broadcasters were using so they could gain access to the spectrum for multi channelling. 170 In April, ACMA commissioned a three month trial in Sydney of broadcast television to hand held mobile devices (using one of the spare television channels) to test the technical viability of the product. 171
ACMA invited comments on licence parameters for both Channel A and B in December 2006. However, guidelines it produced in mid 2007 led to accusations that its content definitions for the channels made Channel A at least commercially unviable. Further complications ensued when it was proposed to require the owner of the Channel A licence to accommodate community television services, as it was thought this may lower the value of the spectrum.

Channel A and B spectrum had not been allocated when the 2007 election was called.

**Surge in uptake**

Despite the problems with Channels A and B, during 2007, there were a number of indications that plans for digital conversion were finally proceeding at a greater pace. The launch of a free electronic program guide was seen as the commercial television industry finally embracing the digital age and the numbers of households that had converted to digital rose from 10 000 in 2001 to 2.3 million (see table below).

**Box 7: estimated numbers of digital television households 2001—2009**

<table>
<thead>
<tr>
<th>Year ends June</th>
<th>Estimated number of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>10,000</td>
</tr>
<tr>
<td>2002</td>
<td>35,000</td>
</tr>
<tr>
<td>2003</td>
<td>150,000</td>
</tr>
<tr>
<td>2004</td>
<td>500,000</td>
</tr>
<tr>
<td>2005</td>
<td>820,000</td>
</tr>
<tr>
<td>2006</td>
<td>1,570,000</td>
</tr>
<tr>
<td>2007</td>
<td>2,300,000</td>
</tr>
<tr>
<td>2008(e)</td>
<td>2,900,000</td>
</tr>
<tr>
<td>2009(e)</td>
<td>4,000,000</td>
</tr>
</tbody>
</table>

(Source: BuddeComm based on DBA data, BuddeComm estimates)

Note: *Digital receivers or digital integrated TVs. (Figures include the sales of STBs, PVRs and integrated digital television sets but do not account for other types of digital television receivers such as digital television receiver cards for personal computers)*

Source: Paul Budde

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173. Electronic program guides (EPG) enable viewers to automate the recording of television programs.

Labor: really ‘go’ this time?

In the lead up to the 2007 election, Labor’s digital television policy appeared to be in a development phase in comparison to its fully outlined commitment to a new broadband network.\(^{175}\) It did appear that the Opposition may have been committed to setting a firm shut down date for analogue spectrum and proceeding with the spectrum auctions for Channels A and B. It was not clear about what conditions of access Labor intended to apply to the auctions, however. It also appeared Labor intended to dismantle the Government’s Digital Australia organisation, which had been set up to promote and co-ordinate an accelerated digital transition, and to establish a digital transition taskforce in the Department of Communications, Information Technology and the Arts.

At the end of April 2007, Senator Coonan accused Labor of having no plan for the rollout of digital television. Coonan asserted Labor had learnt nothing from its:

... complete failure to plan for the analogue switch off on mobile phones, which left Australians in the lurch in the move to digital. Australia can not [sic] afford to repeat Labor’s mistakes of the past.\(^{176}\)

However, given the transition difficulties and the protracted timeframe for digital television that had plagued the Government for a number of years, it was no surprise that Senator Coonan did not pursue the issue of Labor’s mobile phone policy embarrassments further during the election campaign.

Despite its being a low priority in the 2007 election, Ross Honeywill, Executive Director of the consumer think tank, Centre for Customer Strategy, surmised that digital television could emerge as an election decider in 2010.\(^{177}\) Honeywill’s prediction was not fulfilled, however, and digital television was equally a non event in the 2010 contest. This was most likely because the pace towards transition had accelerated significantly in the intervening period. There were a number of reasons for this: Coonan’s change of policy direction, the ‘new broom’ component of a new administration and crucially, the increased public interest in digital technology and acceptance that digital transition was inevitable.


\(^{176}\) H Coonan (Minister for Communications, Information Technology and the Arts), \textit{Labor missing in action on Australia’s digital future}, media release, 29 April 2007, viewed 28 June 2010, [http://parlinfo/parlinfo/download/media/pressrel/RPWM6/upload_binary/rpwm61.pdf;fileType=application/pdf#search=%22digital%20television%22](http://parlinfo/parlinfo/download/media/pressrel/RPWM6/upload_binary/rpwm61.pdf;fileType=application/pdf#search=%22digital%20television%22)

Policy and strategy

Following an election win in November 2007, what had seemed to be Labor’s embryonic digital television policy quickly became a focus for the new Rudd Government. Almost immediately it announced it would revise the digital television switchover date for metropolitan areas to 2009, and 2013 would become the final switchover date for all areas (the regional switchover timetable was released in October 2008 and can be found at Appendix B). In addition, it would terminate Digital Australia (DA) and set up a Digital Switchover Taskforce as previously promised.178

The Opposition countered these announcements with claims that the new Minister, Senator Stephen Conroy, had merely re-badged DA and that the 2013 ‘distant’ switchover commitment masked Labor’s ‘lack of policy planning’ for the nation’s digital future.179 One media commentator, Mark Day, agreed. Day accused the Minister of ‘barefaced cheek’ in denouncing the previous Government’s proposals, while adopting them as his own. Moreover, the new Government’s policy actually added to conversion costs.180 Not surprisingly, Minister Conroy responded to this criticism with claims that the Rudd Government had done more towards digital switchover in its first months than the previous government had done in seven years.181

Regardless of the expected political manoeuvring following an election, one thing was clear—for the Government to achieve its ‘firm’ 2013 switchover target, the rate of digital take up would need to accelerate. Early suggestions on how this could be realised were plentiful. Professor Paul Kerin from Melbourne Business School, for example, urged the Government to provide free set top boxes to consumers. According to Kerin, such a move would encourage consumers and save up to $1 billion as

178. The taskforce was to be headed by Andy Townend, who had previously been the head of Digital Australia. S Conroy (Minister for Broadband, Communications and the Digital Economy), Digital switchover date confirmed, media release, 18 December 2007, viewed 24 February 2010, http://parlinfo/parlInfo/download/media/pressrel/7GCP6/upload_binary/7gcp61.pdf;fileType=application/pdf#search=%22digital%20television%22
180. The Government announced a $37.9 million package at the end of March 2008. Of this funding, $16.9 million was allocated to the Digital Switchover Taskforce and $5 million to research. The government claimed this would amount to a savings of $22 million. In commentator Mark Day’s view, there were no savings involved; rather the policy added $16 million in costs. In addition, the money to be spent on research was unnecessary, as several industry bodies had already undertaken this task. Money to be spent on developing a conversion logo and labelling scheme ($6.7 million) was also unwarranted, as the scheme suggested by Andy Townend, as a result of his British experience, could work equally well in Australia. M Day, ‘Cut the blather, give me $6.7m and I’ll give you a logo’, The Australian, 27 March, 2008, p. 40, viewed 12 March, 2010, http://parlinfo/parlInfo/download/media/pressclp/4ZXP6/upload_binary/4zxp63.pdf;fileType=application%2Fpdf#search=%22cut%20the%20blather%22 Note: ACMA received $8.5 million to conduct technical trials and evaluations of digital transmission as part of the package and an industry advisory group was to be established.
simulcasting became unnecessary. However, as set top boxes had plummeted in price and could be purchased for as little as $40 in 2007, it did not appear that this idea would be a strong motivation for most people. Further, as the American experience had shown, providing everyone with a set top box was complicated, expensive and subject to unforeseen delays. The Government initially declared that it was not convinced the set top box option was viable.

Allowing free-to-air networks to show sporting events on the anti siphoning list on their new digital channels was another proposal. This option may indeed have convinced some viewers to switch to digital, but it was unlikely to have convinced sufficient numbers to justify seriously alienating pay television operators. The ABC argued also that if it were appropriately funded, it could deliver enhanced services to drive digital take up. In particular, it considered there was a compelling case that a dedicated children’s television station, which featured a large percentage of Australian content, would encourage families to switch to digital.

There was some speculation that allowing the long-discussed fourth commercial television licence to proceed as a digital competitor to existing free-to-air licences may promote digital transition. It was thought by some that if this solution were to be considered, the new network would need to present different program options to accommodate fragmentation of audience viewing habits. This view in turn raised the issue of how the allocation of the other digital licences (that is, Channels A and B) would proceed. The Government attempted to put an end to any speculation by declaring that auction of these licences would be delayed pending a review into the viability of the services.

The free-to-air broadcasters sought concrete assurances from the Government about a possible rival and reportedly networks Seven and Nine delayed the launch of their digital channels in protest against the suggestion. But it was not until September 2009 that Minister Conroy took the idea of

183. See comments in Box 3.
187. Ibid.
a fourth network ‘off the table’. There is scope for the issue to return once switchover is realised, given, for example, that a temporary allocation of Channel A to the community broadcasting sector in capital cities to allow community television stations to simulcast their services will expire in 2013. The sceptical might surmise that given the traditional reluctance of Australian governments to estrange existing free-to-air broadcasters, the fourth network will remain the subject of conjecture.

The Digital Switchover Taskforce released a legislative framework discussion paper in May 2008 which presented the Government with enhanced switchover options. These included shortening required simulcast periods in areas that were ready for full conversion. Other options were to introduce legislation to deliver more flexibility to areas experiencing difficulty in achieving switchover readiness or staggered switchovers for smaller geographical areas within wider commercial television broadcasting licence areas. Legislation to this effect was introduced in September 2008 and passed in December.

**Box 8: Freeview**

A ‘Freeview’ consortium of public and commercial broadcasters was formed in late 2008 supposedly to help promote new free-to-air digital channels and drive take up. Freeview was also clearly a strategy which free-to-air broadcasters hoped would entice viewers away from pay television. And indeed, pay television operators were not impressed with what they saw as special treatment for free-to-air broadcasters received in conjunction with the launch of Freeview. This consisted of cancellation of an ACMA investigation of compliance with anti siphoning rules and an exemption for Freeview promotional material from advertising time limit requirements.

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190. This applied to C31 in Melbourne, TVS in Sydney, QCTV in Brisbane and Channel 31 Adelaide. Following an earlier closure of the community station in Perth a new licensee, West TV, launched digital-only broadcasts on 10 April 2010. The Government has indicated that it will consider the issue of permanent spectrum allocation for community television before the digital switchover is completed.


192. Ibid.


194. Freeview had been successful in Britain where it had been previously employed to encourage digital take up.

195. See Jolly, *Sport on television*, op. cit for more discussion of ACMA anti siphoning reviews. Advertising time limits are imposed under the Commercial Television Code of Practice, viewed 9 July 2010, http://www.acma.gov.au/webwr/aba/contentreg/codes/television/documents/2010-commercial_tv_industry_code_of_practice.pdf In prime viewing periods from 6pm to midnight for example, this is generally limited to 13 minutes per hour.
Freeview initially implied that viewers would have access to 15 digital channels and an electronic program guide, but it was forced to modify its campaign after it was clear that there were not substantial content differences between its standard and high definition channels.

At the end of June 2010 there were 16 Freeview channels and an electronic program guide had been launched. Most of these were launched during the later part of 2009. Channels included the Nine Network’s Go! The Seven Network’s 7Two and Ten’s One. Both Go! and 7Two provide light entertainment programs. Ten’s One transmits only sports programs in HD with a simulcast on an SD channel. Seven and Nine HD channels are simulcasts of main network channels.

The Government launched a campaign to improve digital television uptake in April 2009. The campaign featured television, radio and online advertisements, a Get Ready for Digital website, equipment labelling (see illustration below), point-of-sale information and training and accreditation for retail staff.

Get ready for digital television labels

![Digital TV Labels](image)

Source: Get Ready for Digital website\(^{196}\)

Black spots and satellite solutions

The commitment to a firm switch off date made dealing with a number of transition issues critical for the Labor Government. As early as January 2008, the Government was faced with complaints about reception ‘black spots’ which were likely to prevent certain households, such as high rise residence blocks, from receiving digital television.\(^{197}\) Clearly, such ‘spots’ needed to be identified and solutions put in place.

In addition, the release of a switchover timetable in October 2008 revealed that once analogue self help retransmission sites, which provided transmission solutions in analogue black spots closed,


\(^{197}\) For example, it was reported that residents in the world’s tallest residential tower, the Q1 building on the Gold Coast, would not receive digital television. D Ziffer, ‘Switch to digital TV could see viewers left in the dark’, The Age, 12 January 2008, p. 12, viewed 9 July 2010, [http://parlinfo/parlInfo/download/media/pressclp/9EEP6/upload_binary/9eep66.pdf;fileType=application%2Fpdf#search=%22digital%20television%22](http://parlinfo/parlInfo/download/media/pressclp/9EEP6/upload_binary/9eep66.pdf;fileType=application%2Fpdf#search=%22digital%20television%22)
many people in remote areas would receive no television. In response, the Government convinced broadcasters to upgrade more than 100 self help sites to digital capacity.

It also committed to delivering a free-to-air satellite service to provide digital transmission to over a quarter of a million households which would be unable to access services from terrestrial transmitters. Regional households would, however, be required to buy a satellite dish, which could cost approximately $600. In April 2010, the Government announced that an agreement had been reached to establish a joint venture company, Viewer Access Satellite Television (VAST), to deliver the satellite service. A subsidy was to be paid to eligible households to assist viewers convert to the new satellite service.

Channels A and B and the final nail for datacasting?

In October 2003, a licence had been granted to the broadcast infrastructure company, Broadcast Australia (BA), to carry out a three-year trial of datacasting in the Sydney area. The trial involved a number of services, collectively known as Digital Forty Four, presented on one standard 7MHz multiplex.

The BA trial was intended to demonstrate the sorts of niche in-home services that could be carried on Channel A following its scheduled 2007 sale. However, due to circumstances elaborated upon in more detail earlier in this paper, the auction was postponed until after the 2007 election.

Following its election victory, the decisions not to proceed with auctions of long term licences for datacasting in the near future and allocation of the spectrum used by Digital Forty Four to

198. Self help retransmission facilities are licensed by ACMA for sites which have been unable to receive adequate analogue television signals. Generally, the sites are in remote areas, but there are some metropolitan and regional ‘black spot’ reception areas. Reception difficulties can result when a community is situated too far from television transmitter, or if the community is shielded from broadcast signals by obstacles, such as hills or mountains. Residents in highly populated areas may experience reception problems when signals are blocked by tall buildings or from electrical interference. Providing their own low power rebroadcasting transmitter or cable system has enabled communities to reduce the need for individual households to install large, expensive antenna systems to receive television.


200. The Government committed to paying a percentage of this cost for households that had previously received the analogue signal. http://parlinfo/parlinfo/download/media/pressclp/LYKV6/upload_binary/lykv60.pdf;fileType=application/pdf-search=%22digital%20television%22


202. Digital Forty Four services were: a combined program guide for the free-to-air broadcasters (Channel 4); ABC news, sport, and weather items (Channel 41); Channel NSW government and public information, including real time traffic information and life surf webcam images (Channel 45); Australian Christian Channel (Channel 46); Expo home shopping (Channel 49) and federal parliamentary audio broadcasts.
community television signalled the end of BA’s datacasting trials. While BA was keen to continue with the trials until a decision for permanent allocation of Channel A spectrum had been made, ACMA did not renew its licence to do so and the trial ended 30 April 2010.\(^{203}\)

A BA representative considered it ‘counterproductive to remove these digital television TV services from Sydney viewers at a time when the government is encouraging homes to transition to digital TV’.\(^{204}\) Cancellation of the BA licence meant there were no remaining datacasting licensees at the end of June 2010.

The end of the Digital Forty Four trial was widely interpreted as the final nail in the coffin for Channels A and B, given that the purpose of the trial was to demonstrate the sorts of niche services that could be carried on Channel A. Decisions to extend the BA trial had been underpinned by the prospect that an auction of datacasting licences would take place at some time, but according to an ACMA spokesperson, there was no likelihood of that occurring in the near future and no rationale for continuing trials of datacasting services. It appeared Minister Conroy was amenable to the advice of those who considered it unwise to try to fix something that was already broken.\(^{205}\)

### Digital dividend

The digital dividend refers to the spectrum which will become available for other use once the switchover from analogue to digital television transmission occurs (see diagram explaining the dividend below). The question of what to do with the dividend has been increasingly raised as switchover looms.\(^{206}\)

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203. Spectrum was allocated to station Television Sydney (TVS) for digital broadcast until at least the end of 2013 and S Jackson, ‘Datacasting trial to be switched off’, *The Australian*, 1 February 2010, p. 28, viewed 9 July 2010, [http://parlinfo/parlinfo/download/media/pressclp/1QRV6/upload_binary/1qrq60.pdf;fileType=application%2Fpdf#search=%22datacasting%22](http://parlinfo/parlinfo/download/media/pressclp/1QRV6/upload_binary/1qrq60.pdf;fileType=application%2Fpdf#search=%22datacasting%22)


206. It has been speculated that this could amount to $1 billion.
Digital dividend simplified

Source: Australian Financial Review 207

In January 2010, DBCDE released a discussion paper which confirmed the Government intended to release 126 MHz of spectrum once digital switch over has been completed.208 This release of spectrum will require at least some services to be ‘restacked’, that is, to be moved to new channels.209 Restacking will create a large, free block of adjoining spectrum and provide for more efficient use of that spectrum.

There will be impacts for viewers, broadcasters and other users of spectrum from restacking. Viewers will most likely need to rescan their televisions to receive channels and broadcasters may need to purchase new transmission equipment and/or retune their existing equipment.210

A number of options for the use of the digital dividend were canvassed in the discussion paper. These included provision of mobile telecommunications services and mobile television services as well as improving the quality and scope of existing broadcasting services. The latter objective could

207. D White, ‘Mobile phone carriers to chase precious spectrum’, The Australian Financial Review, 9 January 2010, p. 12, viewed 18 March 2010,
208. DBCDE, Digital dividend green paper, DBCDE, January 2010, viewed 18 March 2010,
209. There have been problems reported with restacking in overseas. For example, in Britain when the Freeview platform required receivers to be retuned following channel changes to enable the broadcast of HD services, Freeview received up to 200 calls per minute from concerned viewers.
210. DBCDE, Digital dividend green paper, op. cit.
occur as a result of more demand for the high definition program format or the extension of existing
digital television services.

Suggestions were also made regarding the fate of the Channel A and B spectrum. It was expected
that achieving a 126 MHz dividend would require the inclusion of at least one of the channels. There
was some leeway for the remainder of this spectrum to be used for new broadcasting services,
nonetheless. This could potentially include expanding digital radio services to regional Australia. 211

Comments on the digital dividend paper generally reflected the self-interest of stakeholders.
Community broadcasting and Commercial Radio Australia, for example, argued that the dividend
would maximise benefits to the community and the economy if spectrum was allocated to secure
the future of digital radio. 212 Freeway wanted sufficient spectrum retained for free-to-air broadcasters
so they are able to move to new standards and new technologies such as MPEG-4 and 3DTV. 213 Pay
television on the other hand, believed free-to-air broadcasters had benefited sufficiently from the
conversion to digital; they should receive no special treatment and should manage technology
upgrades of their networks without government assistance. 214 Telstra was opposed to any allocation
of the dividend to broadcasters. It advocated its use for mobile telephony and broadband
services. 215

One media source claimed the paper was ‘a stark confirmation that technology has run down the
politics of media policy, flattening the old days of federal cabinet decisions crafted purely around
the incumbent vested interests of the big media players—particularly in free-to-air television’. 216 The
source praised Minister Conroy’s seizing of opportunities ‘to break through political bottlenecks and

211. As the digital dividend paper notes, digital radio uses VHF spectrum and currently operates only in capital cities. The
digital dividend relates to UHF spectrum, but the way in which VHF spectrum is used can potentially affect the re-
stacking of existing UHF channels, DBCDE, Digital dividend green paper, op. cit. For more on digital radio, see Jolly,
Going digital–digital terrestrial radio for Australia, op. cit.

212. Commercial Radio Australia, Submission by Commercial Radio Australia to the Department of Broadband,
Communications and the Digital Economy digital dividend green paper, 5 March 2010, viewed 8 April 2010,
Broadcasting Association of Australia, Broadcast and spectrum planning issues related to digital dividend green
paper, March 2010, viewed 8 April 2010,
pdf

213. Free TV Australia, Submission by FreeTV Australia Limited, Department of Broadband, Communications and the
Digital Economy digital dividend green paper, 5 March 2010, viewed 8 April 2010,

214. ASTRA, Response to the digital dividend green paper, February 2010, viewed, 8 April 2010,

215. Telstra Corporation, Submission in response to the Department of Broadband, Communications and the Digital
Economy’s digital dividend green paper, 26 February 2010, viewed 8 April 2010,

April 2010,
http://parlinfo/parlinfo/download/media/pressclp/AJLV6/upload_binary/ajlv60.pdf;fileType%3Dapplication%2Fpdf
establish more competitive markets’ and noted that his intention to auction spectrum from the digital dividend received a frosty reception from free-to-air broadcasters. The report restated long standing speculation that the Minister favoured the option of use of the dividend for mobile telephony.

A decision on the size and location of the digital dividend was announced in June 2010. A contiguous block of 126 MHz is to be released in the upper ultra-high frequency (UHF) band, comprising the frequency range 694 to 820 MHz inclusive. The Government intends to auction the digital dividend spectrum in the second half of 2012.

On 30 June 2010, when the switchover process passed another milestone as analogue television was officially turned off in the Sunraysia–Mildura area, it appeared transition was in its final stages and all obstacles had been overcome. Given the tortuous digital journey so far, it remains to be seen if this is truly the case.

Conclusion

At the beginning of this paper it was observed that the transition from analogue to digital television has been predicted to deliver viewers a 21st century experience of on-demand programming, intelligent terminals and abundant channels. For a number of years, as has been noted throughout the paper, many critics have alluded to an Australian experience of transition hampered by the persistence of a 20th century broadcasting tradition which favours the interests of free-to-air broadcasters in policy decision-making.

Concentrated media ownership

This tradition can be summarised as one reflected in concentrated media ownership which has fostered a situation where media barons have wielded an undue amount of influence over policy decisions. Concerns about media manipulation and the preferential treatment of the broadcast media by policy makers have been expressed since the 1930s. To paraphrase Professor Trevor Barr, Australia’s media history has been littered with manifestations of ‘mateship’ towards media barons.

In 2001, Professor Franco Papandrea labelled the Howard Government’s digital television policy as the latest on the list of controversial broadcasting strategies, reflective of the ‘long and unflattering history of protectionist broadcasting policy motivated by political, rather than public interest,

217. Ibid.
considerations’. Papandrea accused digital policy makers and regulators of ‘ignoring the axiom that efficient public policy interventions should endeavour to maximise social welfare’. He saw an ‘ unholy coalition of political and media players intent on protecting or advancing their mutual interests’. Indeed, Papandrea concluded, there was no need to look further for an example of poor public policy than broadcasting policy in Australia.

In the period that followed, others echoed Papandrea’s views, concluding the underlying direction of digital policy was motivated by short-term political interests calculated as best served by placating powerful media proprietors. Certain media commentators singled out aspects of digital policy for particularly scathing criticisms. Crispin Hull, a regular critic of digital transition policy, for example, in relation to the decision to mandate high definition transmissions specifically accused the Howard Government of being intimidated by big broadcasters or ‘sucking up to them, or both’.

In 2007, while the Australian Financial Review’s economics editor, Allan Mitchell, was less specific in his criticism, he was equally disparaging of policy makers and their motivations. In Mitchell’s view, both Labor and Coalition Governments were guilty of acquiescence with the wishes of ‘media mates’. Mitchell placed his argument in the context of recent events:

The Keating government designed its pay TV policy to limit the competition from newcomers to protect the profits of its media mates. And when the newcomers proved more competitive than the government and its mates anticipated, the government simply changed the pay TV rules again.

The Howard government is hardly any better. Its original policy to introduce digital television could not have been more carefully designed to protect the profits of its media mates by denying the public the full benefits of the new technology.

And when that outrageous policy didn’t work, John Howard in effect told his new Minister for Communications to negotiate another media policy with the industry. Only if the industry agreed would the Prime Minister invest the political capital in reform.

The result, of course, was a policy that benefited the incumbents at the expense of competition and consumer choice.

222. Ibid.
223. Ibid.
226. Ibid.
Lack of interest in digital television

While consumers most likely did not try to explain their lack of interest in digital television in academic terminology, they were clearly not inspired in 2001 when the first digital telecasts took place. They were not interested in paying exorbitant amounts to purchase digital receivers; even if they were able to find somewhere to purchase those receivers. Nor were they interested in paying to experience high definition broadcasts, when they already enjoyed quality analogue programs. It has been a long and painful road to convince them that digital television will enhance their viewing experience, made more so, if the arguments of Papandrea and others are accepted, by policy decisions based on maintaining an entrenched broadcasting oligopoly.

From one perspective, it seems incredible that in 2001 the Government was relatively unperturbed by digital’s lacklustre reception. Similarly, given the immensity of the switchover project and the important part television had come to play in people’s lives that it did not promote the technology with more enthusiasm. But the persistence of broadcasting tradition seems a viable explanation for this lack of action. In addition, it could be speculated that the Government was reassured by the fact that, despite such a tradition, Australians generally embraced new technologies with enthusiasm and that inevitably this would happen. The embrace in this instance was simply slower in eventuating.

Media reform as catalyst

In 2006, passage of the Howard Government’s media reform package and the concessions it granted to so-called media mates, combined with Minister Coonan’s new approach to transition appeared to be catalysts which could foster a digital policy position change. Digital take up had become a priority.

On the one hand, however, it could be argued that in spite of the stage being set for change, the underlying thrust of policy did not alter substantially. High definition requirements remained, datacasting continued to be a pariah and multi channelling concessions were limited.

On the other hand, no ‘media mate’ was entirely satisfied with the outcomes from the media reform package. Multi channelling was to be allowed and the discussion of what possibilities could be realised through services on Channels A and B was on the agenda. There appeared to be a realisation that digital technology was indeed not the same as broadcasting and that future policy needed to be formulated differently to accommodate the fact that digital television is not about television per se. Rather, it is about new content and new ways of delivering it; that is, access technology with the capacity to deliver a range of new media services.227

The sceptical could also draw some conclusions about the timing of Minister Coonan’s new directions from the death of media magnate Kerry Packer in December 2005. As noted earlier in this paper, Packer’s influence, (and that of his father previously), had been acknowledged as crucial in

many media policy decisions for decades. His son James was not in the same position to sway governments. It could be argued Minister Coonan astutely seized the opportunity to modify policy before other media players stepped in to fill the power vacuum left by Packer’s demise.\(^{228}\)

This is not to imply that the policy metamorphosis was complete. Concessions were made to the existing free-to-air broadcasters during the final months of the Howard Government, but nonetheless, there appeared to be more sympathy for a revised, more inclusive digital television agenda.

**HD broadcasting requirements vindicated**

Ironically, the Howard Government’s imposition of mandatory HD broadcast requirements, criticised by academics, journalists and other commentators, appears to have been vindicated.

Multi channelling on standard definition was assessed as a better policy option initially because it delivered more obvious benefits for viewers; better pictures and sound than analogue and more channels and at cheaper cost. Conclusions reached in other countries that had started from the same baseline of quality PAL analogue pictures were cited in support of the multi channelling option. In addition, because of the initially prohibitive cost of HD it was easy to draw the analogy that the policy catered to those who could afford to pay more for their entertainment at the expense of those with less disposable income. Telecommunications analyst Paul Budde, for example, believed the multi channelling approach, combined with datacasting options would have better served economically disadvantaged people.\(^{229}\) But the Government remained firm in its commitment, albeit some have suggested, to ensure a longer digital phase-in period and less pain for commercial free-to-air broadcasters.\(^{230}\)

Despite warnings, such as those delivered by the Productivity Commission in 2000, that mandating HD could isolate Australia from market benefits, HD television was integral to overall planning for digital television in the influential United States and Japanese markets. British policy administrator and academic Michael Starks notes, the strength of those two economies was inevitably going to influence world television markets.\(^{231}\) So the introduction of HD was eventually going to have to be considered elsewhere to accommodate programs made in HD for those markets. Additionally, program-makers in other countries were going to have to produce in HD if they wished their work to be accepted by viewers in the United States and Japan.

\(^{228}\) It should be noted also that Packer’s son James did not have the same commitment to the family’s traditional media business. James has been more interested in acquiring gambling assets, and since late 2006, has sold more than 75 per cent of Packer media, including the free-to-air Nine Network.

\(^{229}\) Ibid.


By 2005, interest in HD for terrestrial digital broadcasts was growing, particularly in Britain. The BBC launched an HD channel in 2007 and by April 2008, the British communications regulator, Ofcom, recorded an increasing demand for HD services on satellite and cable. Early criticism of the Howard Government’s support for mandatory HD transmission appears less justified in light of such developments. It appears also the conclusion reached by academic Jeff Bird in 2002 that viewers may prefer high definition over standard definition once they have the opportunity to experience it, has some resonance. Viewers in Europe and the United Kingdom have experienced HD on satellite platforms and want the enhancement extended to terrestrial services.

Such an assessment of the benefits of HD contradicts analysis done as late as 2008 that claimed HD was not generating enthusiasm, except in the United States. Paul Budde concluded this was because the nation ‘dedicated to glamour and entertainment’ deserved better than the world’s worst quality television it had endured for 50 years. There was no such impetus in countries that had been well served by PAL analogue in Budde’s opinion.

So it could be concluded that despite the HD transmission mandate being made more in the interests of existing free-to-air commercial broadcasters, the policy has reaped benefits for viewers. This relatively positive assessment needs to be tempered with the observation that it remains to be seen if those benefits continue when the final analogue switch off occurs. There will be no HD transmission requirement after that time. Therefore, free-to-air broadcasters could decide to discontinue HD transmissions. However, the time for flexibility may have passed. Such a decision may be foolish in light of the increase in popularity of HD elsewhere and the fact that Australians have finally begun to embrace the technology.

At the same time, while HD delivered benefits, it may be that these would have eventuated regardless, as the interest beginning to surface in overseas markets seems to indicate. So without mandated HD transmissions, Australians may have had access to more digital channels and greater programming choice for a longer period, digital take up may have accelerated earlier and more spectrum may have been available for innovative services. The decision to adopt HD may have indeed been better left as a commercial response to market demand. Although, given past experiences, the federal government would most likely still have provided generous subsidies, regardless of when HD was introduced.

It is interesting in this light that the ABC decided in 2010 to cease high definition transmission of its main channel to employ spectrum to open a 24 hour news channel. The national broadcaster argued that it had taken this decision to ensure that it remained within its budget constraints while

233. Ofcom, More choice and new services on digital terrestrial TV: high-definition services to be available free-to-air, media release, 3 April 3008, viewed 15 July 2010, http://www.ofcom.org.uk/media/news/2008/04/nr_20080403b
delivering the maximum benefits of news coverage to the Australian public. As only those who have high definition capability will be able to receive the station, the public interest rationale promoted may, however, appear a little hollow, to those who have not purchased HD televisions.

**Labor’s commitment to firm switchover**

After winning government in late 2007, Labor moved swiftly to institute a ‘firm’ digital switchover date and to address a number of issues. These included finding a solution for digital reception in areas unable to receive terrestrial signals and assistance for those unable to afford digital equipment. It began a comprehensive switchover campaign and has been rewarded with statistics that indicate 68 per cent of households had converted to digital television by the first quarter of 2010. This represented a significance increase from 47 per cent in the same period in 2009.

Interestingly, the schedule of region by region switchover dates released in 2008 departed from previous plans which had envisaged the process commencing in metropolitan areas and progressing to regional areas. This reversal has meant that simulcasts for the majority of Australians have effectively been extended to approximately 13 years. The decision could be explained with reference to the processes discussed earlier in this paper whereby a region by region process allows lessons learned to be applied progressively to later switchovers. At the same time, commencing switchover in regional areas will release a lesser amount of spectrum and delay the accrual of digital dividend benefits. As Professor Papandrea comments:

> As spectrum scarcity is almost entirely a metropolitan area problem, the schedule is a de facto acknowledgement that the anticipated economic benefits of more efficient use of spectrum and a wider range of services to consumers have once again been considerably delayed.

The regional switchover plan is ostensibly more costly for free-to-air broadcasters also, although it is unlikely that they have been overly concerned by these costs, given that the policy defers the entry of potential competitors.

Despite earning the praise of journalists such as Laura Tingle, as a government that has embraced technology to the detriment of vested media interests, Labor’s plans have not differed significantly from its predecessor’s, its criticisms of the Howard Government’s digital policy arguably based more on political considerations than policy difference. So, for example, restrictions on multi channelling remain in place, and consequently, free-to-air broadcasters are not encouraged to present popular programs on these channels. Generally, the channels feature only American

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237. Papandrea, op. cit.

238. See Footnote 219.
programs ‘not considered popular enough to be shown on the main channel’. Similarly, Labor has ruled out the possibility of a fourth broadcasting licence which may have been an incentive for existing broadcasters to deliver more program diversity.

In addition, Labor has been extensively criticised for granting free-to-air broadcasters licence fee rebates in early 2010. Some have claimed these amounted to a $500 million windfall. Minister Conroy justified the rebates as a move which would protect Australian content and assist commercial free-to-air broadcasters in coping with the competition they faced from media. The free-to-air broadcasters saw it as compensation for the spectrum they would lose when analogue signals were turned off. As various commentators observed, however, these broadcasters had already received adequate reimbursement for this eventuality and analogue was not due to be turned off completely for some time. For some, the media mate spectre had returned to haunt yet another government’s broadcasting policy.

Continuing change

At the same time, continuing the process of change that arguably can be traced to the 2006 media reform package of its predecessor, Labor has declared that the switchover digital dividend will be employed not just for broadcasting, it will be used to deliver ‘substantial connectivity and productivity benefits’. In other words, to make use of the potential of digital technology that goes beyond a passive television experience; to deliver the promised world of on-demand interaction, intelligent terminals and multiple experiences.

There are some who believe this world will signal the end of the free-to-air model of broadcasting; innovative technologies will liberate people from ‘the tyranny of the TV programmer’. Internet Protocol Television (IPTV) and other innovations will deliver tailored, individualised experiences which will make mass television viewing obsolete.

Others believe there will still be a place for traditional television in the digital world. As in the past, it will represent an important social experience and people will continue to watch history being made, follow sports events and enjoy great entertainment ‘through the medium of television in the

comfort of their own homes’. 244 One piece of research assesses the IPTV, mobile and WebTV phenomenon more as an indication that ‘television is mutating across platforms and the contexts through which it is consumed are multiplying’ and that this indicates that ‘far from approaching its demise, television is alive and well’. 245 In other words, there needs to be a more nuanced assessment of how digital technologies will interact with television, rather than an assumption that they will replace it.

As media academics Graeme Turner and Jinna Tay note, it is often assumed the rise in consumption of so called threats, such as IPTV, necessarily equates with the demise of broadcast television. This may not be the case, however. Rather, it may be that the capacities of new technologies in areas such as copying and sharing of information and entertainment will be the means to enhance the traditional television experience. Television can in fact become less passive; it can be customised, personalised and responsive.

So, what may be different in the future is that watching television will be individualised and accompanied by texting, watching some other fare on a mobile phone or enhanced in other ways. But it is likely television will remain:

... supreme at holding the attention of a large number of people for long periods. Other gadgets divert people from the box, but not nearly as much as TV diverts them from all those other gadgets. 246

244. P Thomas, 20th century major innovations, op. cit.
Appendix A: community television—digital afterthought

In December 1992, community television began broadcasting in Australia under a trial arrangement. The Keating Labor Government directed that the last available high power free-to-air television channel was to be used on a temporary basis by the community television sector until permanent arrangements were made for the channel. This understanding was reaffirmed in 1998 by the Howard Government for the six community television operators then broadcasting (in Sydney, Melbourne, Brisbane, Adelaide, Perth, and Lismore).

Following the commencement of digital simulcast periods in metropolitan areas, the issue of the transfer of community television to digital transmission was raised in a government discussion paper. The paper, released in June 2001, concluded there was no clear consensus among stakeholders in relation to an appropriate digital carriage model for community television. Some stakeholders wanted sector operators to control digital spectrum in their own right. Others considered that a third party should be enlisted to provide operating capacity to the sector. An immediate or short-term transition to digital transmission for the sector was not seen as a priority.247

During the 2001 election campaign, the Government promised that free spectrum would be made available to community television and that it would work with the sector to ensure that it experienced a smooth transition to digital operation.248

A government review reported in 2002 that there continued to be little support for an early commencement of digital transmission for community television. The principal reason for this was thought to be the poor financial state of most community operators which meant that costs associated with digital transmission were beyond their capacity. A further reason was that the combination of a small audience base and the low take up of digital within that base would result in much of the community television audience being denied access to the service if it moved to digital.249

247. ABA, Investigation into the community television trial: report to the Minister for Communications, Information Technology and the Arts, July 2001 as reported in DCITA, The future of community television: a review of the regulatory arrangements that should apply to the digital transmission of community television broadcasting services using spectrum in the broadcasting services bands and how access to spectrum should be provided free of charge, DCITA, June 2002, viewed 30 June 2010, http://parlinfo/parlinfo/download/library/jrnart/EBY66/upload_binary/eby664.pdf;fileType=application/pdf#search=%22digital%20television%22


249. DCITA, The future of community television, op. cit.
The Government reaffirmed its commitment to include community television in the digital environment in the 2004 election campaign and in the 2006 Digital Action Plan. But despite this rhetoric, ‘it failed to give any definition of steps to enable this to happen’. 250

By February 2007, the issue of how and when community television would move to digital was seen as urgent by the community sector. The Community Broadcasting Association of Australia argued it needed long-term financial support and was at a critical stage in its development. It was:

... ready and able to make the next step in its evolutionary journey: the transition to digital broadcasting...Yet so far the community broadcasting sector has been denied parity with the commercial and public industry sectors, has no allocation or reservation of any digital spectrum, has the lack of a clear decision on the method for community access to digital broadcast spectrum, and has no financial support for digital transmission. It seems rather inequitable. 251

At the same time, the House of Representatives Standing Committee on Communications, Information Technology and the Arts investigation into community broadcasting considered that ‘spectacular’ growth in the industry would be negated if it were not provided with the opportunity to simulcast during the digital transition period. Moreover, it needed certainty about access to permanent spectrum following analogue switch off. The House Committee recommended various options. These involved imposing obligations on the purchaser of the licence for Channel A to carry community television during the simulcast period and the conversion of (Channel 31) spectrum to digital as a permanent home for the sector once switch off was achieved. 252

Community (and national) radio broadcasters received funding in the 2007–08 Budget to assist them to commence digital radio broadcasting in the six state capitals by January 2009. 253 There was no funding forthcoming in the last Howard Government Budget for community television, however.

In March 2009, the Government promised that the community sector would not be left behind in the migration to digital, so expectations were high that funding would finally eventuate in the 2009–10 Budget. 254 But in 2009, the sector was once more disappointed. In response, one community broadcaster expressed the frustration the sector felt:


252 Ibid.


This government is willing to pour money into schemes to try to convince the viewing public to convert to digital television, whilst overlooking the main driver of digital conversion: content. C31 Melbourne [Melbourne’s community television station] believes that making its wide array of unique locally-produced content available on digital would be an excellent stimulus to digital take-up.\textsuperscript{255}

The sector called for urgent meetings with the Government to discuss the long term future of community broadcasting. One analysis of the 2009–10 Budget pointed out that when commercial free-to-air broadcasters were given access to free spectrum to assist them with simulcasting arrangements during the switchover to digital, community television was not included in the deal. In addition, significant funding had been provided to public broadcasters. What was required for the community broadcasters to convert was ‘peanuts’ in comparison.\textsuperscript{256}

By November 2009, the Government had agreed to allocate the vacant spectrum, previously known as Channel A, temporarily to the community broadcasting sector. This allowed community stations C31 in Melbourne, TVS in Sydney, QCTV in Brisbane and Channel 31 Adelaide to simulcast their services until the switch to digital-only television in capital cities in 2013. A new community licensee in Perth was to commence digital-only broadcasts in 2010.

The Government also allocated funding support of $2.6 million to enable the community sector to meet the costs of commencing digital simulcasts. The Minister, Senator Stephen Conroy, maintained:

\begin{quote}
This initiative will bring Community TV into line with commercial and national broadcasters, and ensure their loyal and passionate audiences can continue to enjoy their beloved local Community TV stations as they switch to digital television.\textsuperscript{257}
\end{quote}

While the Minister noted that the funding allocation had been settled after consultation with the Australian Community Television Alliance, the funding was a far cry from the amount estimated by the House of Representative inquiry in 2007. The House Committee recommended $6 million in initial funding followed by $1.7 annually until the end of the simulcast period.\textsuperscript{258} The Opposition quickly raised the issue of funding adequacy, questioning if it would be sufficient to undertake the necessary infrastructure upgrades required to commence digital simulcasts.\textsuperscript{259} The Australian Greens

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\textsuperscript{255} \textit{television}, media release, 10 May 2009, viewed 1 July 2010,
\texttt{http://parlinfo/parlInfo/download/media/pressrel/BWIT6/upload_binary/bwit60.pdf;fileType=application%2Fpdf#search=22Budget%20must%20end%20uncertainty%20for%20community%20television%22}
\textsuperscript{258} S Conroy (Minister for Broadband, Communications and the Digital Economy), \textit{Digital pathway for community TV}, media release, 4 November 2009, viewed 1 July 2010, \url{http://www.minister.dbcde.gov.au/media/media_releases/2009/100}
\textsuperscript{259} House of Representatives Standing Committee on Communications, Information Technology and the Arts, \textit{Community television}, op. cit.
also raised the issue of funding, insisting that it was a ‘drop in the ocean’ in comparison to the $12 million needed. The Greens added that there were other questions that remained unanswered, such as, whether high definition had been taken into account in the formula.260

The good news for the sector was that the Minister acknowledged a permanent channel allocation for community television needed to be established before the final digital switchover and that several options were possible, including digitising Channel 31. At the same time, however, the sector most likely did not welcome the implication that it would be expected to rely in the future perhaps wholly on the community for financial support. In Minister Conroy’s words:

... relying on government handouts and constantly chasing public funding is an inefficient use of [community television] time, and hardly provides the certainty and self-sufficiency required to operate a TV station with confidence. After all, community broadcasting is just that—broadcasting created by and supported by the community it serves. It is at its most successful when it achieves true independence from Government, and is firmly rooted within the community. A successful community television station in the future will be able to sustain itself primarily from the support of the community it serves.261

260. S Ludlam, Community television gets support in going digital, media release, Australian Greens, 4 November 2009, viewed 1 July 2010, http://parlinfo/parlInfo/download/media/pressrel/6C4V6/upload_binary/6c4v60.pdf;fileType=application%2Fpdf#search=%22digital%20television%22

261. S Conroy (Minister for Broadband, Communications and the Digital Economy), C31 digital community TV forum, speech, 9 November 2009, viewed 1 July 2010, http://parlinfo/parlInfo/download/media/pressrel/S0TV6/upload_binary/s0tv60.pdf;fileType=application%2Fpdf#search=%22digital%20television%22
## Appendix B: digital switchover timetable

<table>
<thead>
<tr>
<th>Type</th>
<th>Switchover Area</th>
<th>Major centres</th>
<th>Window</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIC</td>
<td>Mildura/Sunraysia</td>
<td>Mildura</td>
<td>30 June 2010</td>
</tr>
<tr>
<td>SA</td>
<td>Broken Hill</td>
<td>Broken Hill</td>
<td>15 December 2010</td>
</tr>
<tr>
<td>SA</td>
<td>Riverland</td>
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<td>Gippsland</td>
<td>Traralgon, Bairnsdale and Malacoota</td>
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Appendix C: how analogue television works

Cathode ray

Cathode ray analogue television makes moving pictures out of a stream of still pictures, each one of which is minimally different from the picture before it. A camera focuses each of these pictures onto a glass vacuum tube to record them on a grid of tens of thousands of tiny picture pieces (or pixels) at the back of the tube. Each pixel is a light-to-electricity converter that measures the amount of light at that spot and converts the measurement into an electrical signal. The cameras send pixel measurements to be amplified and broadcast.

Analogue television receivers pick up these signals and reassemble them on a picture tube, also divided into pixels. The signals control an electron gun, which shoots electrons, these in turn, are stopped by the glass of the tube. This glass is coated with special chemicals called phosphors that glow when hit with the electrons. The electron gun sweeps across the back of the screen, hitting each phosphor pixel until it has covered the whole screen. The power of the electron beam is controlled by the incoming signal, so each pixel glows at intensity as required.

This process happens very quickly and the overall result looks like one continuous picture. In reality, it is a series of still images. 262

Cathode ray tubes have a serious drawback: in order to increase screen width, the length of the tube needs to be increased. Consequently, big-screen cathode ray television is heavy and bulky.

Plasma and LCD

Newer plasma analogue televisions use red, green, and blue phosphors, like cathode ray television, but instead of hitting the phosphors with a beam of electrons, plasmas charge xenon and neon gas trapped between two glass panels. The charged gas releases ultraviolet photons, which strike the phosphors, and these in turn, emit coloured light that produces the television picture.

LCD screens (liquid crystal display) employ a bright white backlight behind millions of tiny crystals. LCD creates images by using an electric field to manipulate these crystals, the backlight shine through them to create various colours.

The main advantage of plasma and LCD display technology over cathode ray is that these newer technologies can deliver very wide screens using extremely thin materials. 263

263. For more detailed explanation of Plasma and LCD technology see the How Stuff Works website, viewed 8 January 2010, at: http://electronics.howstuffworks.com/lcd.htm and http://www.howstuffworks.com/plasma-display.htm
Glossary

Amplitude modulation (AM): amplitude modulation is the method of combining radio carrier waves and electric waves so that the amplitude of the carrier waves varies to match the change in the electric waves. The AM band of the electromagnetic spectrum is between 535 and 1705 KHz.

Analogue television: standard analogue television is transmitted by continuously varying signals—the video component as an amplitude modulation (AM) signal and the audio in frequency modulation (FM). Analogue television signals vary in accordance with the colour and brightness of the elements of the original pictures being broadcast. Any disturbance to an analogue television signal, for example, noise along the transmission path, introduces impairments that cannot be removed. These impairments result in reduced quality of resolution.

Anti siphoning: an anti siphoning regime in general prevents certain televised events, which have been listed by government, from being appropriated or ‘siphoned off’ by pay television operators so that only those that subscribe to a pay service are able to view the events. Siphoning is seen therefore as detrimental to free-to-air viewers.

Aspect ratio: refers to the relative width and height of a picture. Analogue television has an aspect ratio of 4:3. High definition television has an aspect ratio of 16:9—a wide-screen ratio.

Bandwidth: in electronic communication, bandwidth is the width of the range (or band) of frequencies that an electronic signal uses on a given transmission medium. Bandwidth is expressed in terms of the difference between the highest-frequency signal component and the lowest-frequency signal component. The frequency of a signal is measured in hertz (the number of cycles of change per second. See further definition in the relevant section of this Glossary), so a given bandwidth is the difference in hertz between the highest and the lowest frequency the signal uses. A typical voice signal has a bandwidth of approximately 3KHz and an analogue television broadcast video signal has a bandwidth of 6 MHz, some 2000 times as wide as the voice signal.

Broadcasting Services Bands: the broadcasting services bands are the designated parts of the radiofrequency spectrum which have been referred to the Australian Communications and Media Authority for planning under section 31 of the Radiocommunications Act 1992. Normal analogue commercial broadcasting services (AM and FM radio services and free-to-air ultra high frequency (UHF) and very high frequency (VHF) television services) are provided on the broadcasting services bands.

Blu-ray: Blu-ray is an optical disc format. It was developed for recording and playing back high definition (HD) video and for storing large amounts of data. While a compact disc (CD) can hold 700 MB of data and a basic digital video disc (DVD) can hold 4.7 GB of data, a single Blu-ray disc can hold up to 25 GB of data. Blu-ray discs can hold more information than other optical media because of the blue-violet lasers the drives use. The blue-violet laser has a shorter wavelength than the red laser.

264. For an explanation of AM and FM radio signals see R Jolly, Going digital—digital terrestrial radio for Australia, op. cit.
lasers used for CDs and DVDs (405nm compared to 650nm). This allows the laser to focus on a smaller area, which makes it possible to cram significantly more data on a disc the same size as a CD or DVD.

Closed captioning: describes text descriptions of the speech, music and sound effects of a television program. Closed captioning is created primarily for those who are hearing impaired.

Compression: digital signals can be compressed to reduce the amount of bandwidth needed to broadcast them. MPEG-2 has been specified as the industry standard and can produce pictures ranging from VHS to HDTV quality. Four standard definition digital television channels can be compressed into the space of a single analogue channel. A single full-range channel of HDTV will take up the same space.

Datacasting: section 6(1) of the Broadcasting Services Act 1992 describes datacasting as the delivery of content in the form of text, data, speech, music or other sounds, visual images or in any other form, or in any combination of forms, to persons having equipment appropriate for receiving that content.

Digital dividend: a large amount of broadcasting spectrum that becomes available when television in Australia switches from analogue to digital transmission.

Dolby Digital: six channel digital audio specified as industry standard for HDTV, sometimes know as Dolby 5.1 Surround Sound or AC-3. It is intended to be played through an audio set-up comprising of 5 speakers—front left, front right, front centre, surround or rear left, surround or rear right and a subwoofer.

DVD: an optical disc technology with enough capacity on a single-sided, one-layered disc to store a cinema release film. DVD uses the MPEG-2 file and compression standard. Audio quality on DVD is comparable to that of an audio compact discs.

Electromagnetic spectrum: the electromagnetic spectrum is a continuum of all self propagating radiation waves arranged according to frequency and wavelength. References to spectrum available for digital television refer to the range of frequencies available for over the air transmission

Electronic program guide (EPG): on screen display of available channels and program information.

Frequency modulation: (FM) conveys information over a carrier wave by varying its frequency rather than amplitude.

Hertz: used to measure frequency. One hertz is equivalent to one cycle per second of electromagnetic energy. Kilohertz: refers to thousands of cycles per second of electromagnetic energy. Megahertz: refers to millions of cycles per second of electromagnetic energy. Gigahertz: refers to billions of cycles per second.

High definition television (HDTV): a version of digital television. Both types of digital system produce better picture quality than analogue. HD widescreen however, delivers a sharper image.
than SD—up to twice the horizontal and three times the vertical resolution. The generally agreed upon industry standard for HDTV is a signal with a picture resolution around twice the size of analogue PAL TV. The picture ratio is of 16:9 as compared with 4:3 analogue. HDTV offers 5.1 Dolby digital surround sound and enhanced picture quality with reduced interference.

**High Definition Digital Versatile Disc (HD DVD):** HD DVD was intended to be the high definition successor to standard DVD, but has since found itself in a format war with Blu-ray. HD DVD discs can store more than three times as much data as standard DVDs.

**Interactive television:** digital television allows for data can be sent both ways, that is, for interaction between the broadcaster and receiver of information. In addition, both Blu-ray and HD DVD technologies allow for interactive features and programming languages to be installed that are beyond the scope of standard DVD or VHS systems.

**Interlaced Scanning:** method of composing a picture on the screen by writing all the even lines first, then all the odd lines; the result is a complete picture composed of two interlaced half pictures.

**Internet Protocol (IP):** is the method by which data is sent from one computer to another on the Internet.

**Internet Protocol television (IPTV):** the delivery of programming by video stream encoded as a series of Internet Protocol (IP) packets. IPTV is distributed by a service provider and can be free or subscription. It can deliver live television or stored video. In traditional television, programming is broadcast simultaneously to the home, but IPTV transmits one program at a time.

**Letterbox mode:** a way of presenting 16:9 ratio wide-screen movies on a television screen which has a ratio of 4:3. Black bars are added to the top and the bottom of the picture to resize the area of the television used to view the moving image.

**Liquid crystal display (LCD) television:** an LCD television uses individual liquid crystal cells electrified with current. As crystals align and stop light from shining through, or conversely scatter allowing the light to shine through a moving image is formed on the LCD screen. LCD screens usually only display progressive scan format. LCDs do not use phosphors and are therefore not susceptible to screen burn.

**MPEG:** compression standards as agreed upon by the Motion Pictures Expert Group—the international group of industry experts who set standards for compression of audio and video. MPEG-2 has been specified for HDTV broadcasts but some suppliers, particularly those looking at Internet protocol Television (IPTV) as a medium for broadcast are already looking into MPEG-4.

**MPEG-2:** compression standard designed to cover a range of digital video requirements from fairly low (VHS quality) to HDTV. It is also used in DVD encoding where it is converted into a Versioned Object Base (VOB) file, which can contain video, audio, subtitle and menu contents multiplexed together in a stream form.
**MPEG-4:** MPEG and MPEG-2 standards made interactive video on CD-ROM, DVD and digital television possible. MPEG-4 can deliver higher levels of interaction with content. It can bring multimedia to new networks, including those employing relatively low bitrate and mobile networks.

**Multi channelling:** multi channelling makes use of digital spectrum for the broadcast of several different channels simultaneously. Spectrum refers to the range of frequencies available for over the air transmission.

**Multiplex:** combining two or more independent signals into one transmission channel or the combined digital signals transmitted on one satellite transponder.

**Narrowcasting:** sections 17 and 18 of the *Broadcasting Services Act 1992* define narrowcasting services as broadcasting services whose reception is limited by: being targeted to special interest groups; intended only for limited locations; provided during a limited period of time; because they provide programs of limited appeal; or for some other reason. Narrowcasting services operate under a broadcasting class licence regime, with minimum levels of regulation. Subscription narrowcasting services differ from open narrowcasting services in that they are made available only on payment of subscription fees.

**National Television System Committee system (NTSC):** analogue broadcasting system for colour television used in the United States. (Note: Colour television was first introduced in the United States in 1953, but the National Television System Committee system (NTSC) used by the Americans, experienced a number of problems with colour tones. So it was sometimes referred to as NTSC—Never the Same Colour. In the mid 1960s, the alternate Phase Alternating System (PAL) was introduced by the Germans and the French also invented a colour system, the Sequential Couleur avec Memoire (SECAM)).

**Non Broadcasting Services Bands:** radio frequency spectrum outside the broadcasting services bands.

**Phase Alternating Line system (PAL):** a colour encoding system used for analogue broadcast television systems in a number of countries. PAL signals run at 25 frames per second and are incompatible with the United States’ NTSC standard which runs at 30. The PAL Standard transmits 625 lines of resolution which is almost 20 per cent more than the NTSC Standard of 525 lines. PAL is generally accepted to result in a superior quality picture to that of NTSC. (See also note attached to the NTSC definition as above).

**Pillarbox:** method of displaying analogue 4:3 aspect ratio images on a 16:9 widescreen. The picture is scaled to fit the television screen without distortion. The picture can fill the height of the screen but not the width so as in the case of the letterbox display dark bars are placed either side of the moving picture.

**Pixel:** short for picture element—a pixel is a single point in a graphic image. The intensity of each pixel is variable. In colour systems, each pixel typically has three or four variable dimensions as red, green and blue, or cyan, magenta, yellow and black. Digital television pixels are rectangular in shape
while HDTV pixels are virtually square and significantly smaller in size. This allows HD pictures to contain many more pixels dots than standard definition, resulting in a far higher resolution and superior format.

**Progressive scan:** in Progressive Scanning all the horizontal lines comprising a television picture are scanned on to the screen at once. Digital television and HDTV accept both interlaced and progressive scan broadcast/display methods.

**Plasma display:** a plasma television uses hundreds of thousands of miniature embedded cells to produce a picture. Each cell is equal to a single pixel and has three sub-cells. These three sub-cells are filled with plasma gas which glows red, green or blue when electrically charged. Light from the three sub-cells combines to form a single coloured pixel on the screen. One of the most frequent problems with plasma television is burn-in. This occurs because plasma televisions use phosphor coated screens.

**Resolution:** measurement of the smallest detail that is visible or can be resolved in a video image. Resolution is influenced by the number of pixels in the image, but is also due to other factors such as the quality of any display tubes, lenses or film scanners which are used to produce the image on the screen. HDTV refers to two types of resolution which interacts at destination (that is the television set). Native resolution is the maximum number of pixels that a HDTV can display. Source resolution is the number of pixels used in the broadcast of the program and this is decided by a content provider. If a HDTV has less native resolution than the source, there will be some loss of quality, but if the HDTV has a higher native resolution than the source there will be no improvement seen.

**Set-top box:** a device that connects to a television and an external source of a signal. The box turns the signal into content which can be displayed on the television screen. Not all set top boxes are capable of receiving HDTV.

**Standard Definition television (SDTV):** SDTV digital television has the same resolution and aspect ratio as traditional analogue television. The resolution used for SD is 576i, that is, 576 horizontal lines which are interlaced. The aspect ratio is 4:3.

**Subscription television:** television programming which is provided to consumers for a fee. Subscriber television often transmits to its customers’ special channels offering a variety of programming such as movies, sporting events, children’s entertainment, news and other informational services.

**Ultra High frequency (UHF):** designates a range of electromagnetic waves whose frequency is between 300 MHz and 3 GHz. Waves whose frequency is above the UHF band fall into the microwave or higher bands, while lower frequency signals fall into the VHF or lower bands.

**Very High Frequency (VHF):** frequency range from 30 MHz to 300 MHz. Common uses for VHF are FM radio broadcast at 85–108 MHz, television, terrestrial navigation systems and marine and aircraft communications.
**Videocassette recorder (VCR)**: an electromechanical device for recording and playing back full-motion audio-visual programming on cassettes containing magnetic tape. Most videocassettes have tape measuring 1.27 cm in width.

**Video Home System (VHS)**: a videocassette recording technology.