

DISCUSSION DOCUMENT

DIGITAL TELEVISION

Radio Spectrum and Broadcasting Policy Group
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Contents

- Ministers’ Foreword 3**

- Introduction 5**
 - Digital Television 5
 - Purpose and Scope of Discussion Paper 5
 - Key Issues 6
 - Next Steps 6

- Background..... 7**
 - Television Broadcasting in New Zealand 7
 - Recent Industry Developments 8
 - Overseas Experience 9

- Policy Context..... 10**
 - Government Goals..... 10
 - Initiatives to Promote the “Knowledge Economy” 10
 - Regulatory Framework for Broadcasting..... 11
 - Radio Spectrum Management 11
 - Telecommunications Inquiry..... 12
 - Previous Government Decisions 12

- Issue 1: Technology Choices..... 14**
 - Transmission Platforms..... 14
 - Service Capabilities..... 15

- Issue 2: Spectrum Allocation..... 17**
 - Spectrum for Satellite Television..... 17
 - Spectrum for Terrestrial Use (DTT and DDN) 19
 - How Should Spectrum be Allocated? 19
 - Management Rights..... 20
 - Spectrum Licences 20
 - Market-Based Allocation Options..... 21
 - Allocation of Spectrum to Existing Broadcasters for Simulcasting..... 22
 - Competition Issues 25
 - Application of the Commerce Act 26
 - Acquisition Limits..... 27

- Issue 3: Analogue “Switch-Off” 29**

- Issue 4: Reception in the Home 31**
 - Set Top Boxes 31

- Issue 5: Geographical Coverage..... 33**
 - Access to Services 33
 - Cost of Access to Services 34
 - Timeframe for Introducing Digital Services in Rural Areas..... 34

Issue 6: Implications for Public Broadcasting	36
Programme Funding	36
Audience Fragmentation	36
Non-Commercial Television	37
Māori Television	37
Retransmission Rights.....	37
List of Questions	39
Responses to Discussion Paper	42
Appendix 1	43
Appendix 2	46
Glossary	47

Ministers' Foreword

At present, most of the television programmes that we watch in our homes are broadcast in traditional analogue format. Over the next decade or so, the old analogue format will give way to digital broadcasting which, among other things, will provide better picture quality and allow more channels to be broadcast.

There may also be changes in the nature of transmission systems. Today, most New Zealanders receive television signals transmitted from high sites around the country using VHF or UHF radio spectrum. An increasing number of New Zealanders are receiving television services by way of satellite or cable.

The shift from analogue to digital broadcasting, of course, is not unique to New Zealand. All countries which broadcast television will be affected. But the timing of the change, and how this is managed, will vary from country to country in line with international trends and national circumstances and policies.

This paper addresses the question of a digital television policy for New Zealand. In particular, the paper considers what role the Government should have, if any, in facilitating digital television. For example, should the Government go further than ensuring that adequate radio spectrum is made available to broadcasters?

In answering this general question, it will be necessary to take into account a number of considerations, including:

- the Government's objectives for broadcasting, and wider goals such as promoting the "knowledge economy";
- the nature of broadcasting in New Zealand;
- New Zealand's regulatory framework for broadcasting, and communications more generally;
- decisions arising from the Telecommunications Inquiry, and a charter for Television New Zealand, where these have implications for the industry as a whole;
- the example and experience of other similar countries.

It is not the intention of this paper to provide a detailed technical discussion of digital television broadcasting. This can be found elsewhere. Nor is it the intention to base the discussion on the Government's ownership interests in Television New Zealand. The issues addressed in the paper essentially concern the Government's regulatory and policy interests in the broadcasting industry as a whole.

At this stage, the Government has not developed a firm view on the role it should have in relation to digital television. While this is not a matter of the utmost urgency, it is important for some key decisions to be made in the near future to allow broadcasters to plan with more certainty.

This paper is intended to advance that process. We would encourage all those with an interest in the topic to consider the issues discussed in the paper, and to make submissions so that their views can be taken into account as the Government develops its policy in this area.

Hon Paul Swain
Minister of Communications

Hon Marian L. Hobbs
Minister of Broadcasting

Introduction

Digital Television

1 Television services were introduced into New Zealand in the early 1960's with transmitters serving a number of the main centres. These services, and all subsequent services, have used internationally recognised standards based on analogue technology. International standards for digital technology are now available and a number of countries are moving to implement digital services.

2 In this paper, "digital television" refers to the final mode of transmission to the viewer. Much television production and distribution already uses digital technology, but transmission to the home is generally still based on analogue technology. There are, however, some digital services already operating in New Zealand, specifically the satellite service of Sky Network Television Limited ("Sky") and recently introduced cable services in some areas.

3 Digital transmissions, either by satellite or by land, offer a number of advantages over analogue broadcasting. These include better reception quality, increased programme capacity, new features such as programme guides, multi-view, and interactive services, as well as potential convergence with the internet. In the long term, digital technology is likely to be more cost effective for broadcasters than analogue, but in the short to medium term there will be added costs for broadcasters implementing digital transmissions, and also for viewers.

Purpose and Scope of Discussion Paper

4 This paper discusses what actions should be taken by the Government in facilitating the wider introduction of digital services in New Zealand. It is expected that the introduction of free to air digital services will represent the beginning of a transition to fully digital services and the eventual discontinuation of analogue broadcasts, perhaps in the next 10-15 years. All existing receiving apparatus will require either augmentation or replacement once analogue transmissions cease. It is desirable for planning and investment purposes that the role of the Government in facilitating the development of digital television is addressed and clarified in the near future. At this stage, the Government has not developed a firm view on what its role should be.

5 The issues addressed in the paper essentially concern the Government's regulatory interests. The paper is not concerned directly with the Government's ownership interest in Television New Zealand. Nor does it contain a detailed technical discussion of digital television broadcasting, which can be found elsewhere.

6 A discussion of regulatory issues in relation to digital television, however, necessarily involves touching on issues that go further than digital television per se. There are important linkages between digital television and other aspects of the Government's broadcasting policy, for example, its intention to refocus the operation of Television New Zealand. There are also important linkages with the Government's objective to ensure that rural/provincial areas of New Zealand are not denied the benefits of a "digital future". Digital television therefore needs to be viewed in a broad policy context. This is explored further in later sections of the paper.

Key Issues

7 In addressing the role of the Government in facilitating digital television, it is helpful to think of the issues in three broad categories:

- the availability of digital signals, both geographically and at what time;
- viewer access to digital content;
- implications for related policies.

8 The question of the availability of digital signals raises such issues as: whether the Government should mandate or seek to influence the choice of which technology or technologies are used to provide digital services; what radio spectrum should be allocated to make this possible, and how and when such spectrum should be made available; and whether the Government should mandate when present analogue services should cease.

9 The question of viewer access to digital content raises issues such as: whether the Government should require “open access” systems for reception in the home, and for use by broadcasters in providing services; and whether the Government should require or encourage digital television services to be provided to a similar percentage of the population as currently receives analogue services.

10 How these issues are resolved will be influenced by, and have implications for, a number of related policies, including: Television New Zealand’s charter; Māori television; non-commercial, regional television broadcasting; and the promotion of local content and special interest programming. The organisational form and objectives of Television New Zealand have already been the subject of Government decisions.

11 They will also be influenced by attitudes towards government regulation generally. On the one hand, digital television could be perceived as a paradigm shift in broadcasting, more fundamental than the introduction of colour television. It might be seen as heralding far reaching changes in industry structure and operation, and viewer behaviour. On the other hand, digital television could be perceived as a technological development, and a change in market conditions which, while clearly important, is best left to the market to manage.

12 More specific questions within the scope of these general issues are set out at the end of each chapter. This paper may not be exhaustive: accordingly interested parties are welcome to submit comments on any other relevant issues in addition to those specifically outlined in the paper.

Next Steps

13 After the closing date for submissions (15 April 2002), the Ministry of Economic Development, in conjunction with other Government departments, will be reporting to Ministers on what decisions, if any, should be taken by the Government. Views expressed in submissions will be reflected and taken into account in this process. It is envisaged that a summary of views will be prepared and published on the Ministry’s website.

Background

Television Broadcasting in New Zealand

14 Free to air television broadcasting in New Zealand is characterised by two key players, with several smaller broadcasters targeting smaller audiences. There are currently also two providers of pay tv services. Existing broadcasters are briefly surveyed below.

Television New Zealand

15 Television New Zealand is a state-owned enterprise, with all shares in the company held by two Ministers of the Crown. It currently operates along commercial lines, in direct competition with privately-owned broadcasters. The Government has announced that Television New Zealand is to be restructured into a Crown company with the objective of giving effect to its charter while maintaining its commercial performance. In 2000, TV One held approximately 42% of the national free to air audience share, while TV2 had a share of approximately 28%. Both TV One and TV2 reach nearly 100% of the New Zealand population across two nationwide analogue terrestrial networks.

CanWest Global Communications

16 CanWest owns TV3 and TV4. In 2000, TV3 and TV4 had national free to air audience shares of approximately 19% and 5% respectively. TV3 reaches approximately 98% of the New Zealand population through a nationwide analogue terrestrial network. TV4 is broadcast across the major metropolitan centres, reaching approximately 75% of the population through an analogue terrestrial network.

Prime Television New Zealand Ltd

17 Prime TV is a subsidiary of Prime Television Pty Limited, a publicly-listed Australian company. Prime TV is broadcast in nine major cities and provincial centres through an analogue terrestrial network, reaching approximately 70% of the population.

Sky Network Television Ltd

18 Sky was the first provider of pay tv services in New Zealand. Sky operates both an analogue terrestrial network covering approximately 74% of New Zealand households, and a satellite-based digital network covering the entire country. At 30 June 2001, Sky had a total of approximately 430,000 subscribers to its analogue and digital networks, representing approximately 30% of all households. There are approximately 266,000 subscribers to Sky's digital service.

Totalisator Agency Board (TAB)

19 The TAB operates a network of UHF stations providing coverage of around 70% of the population, with programming focussed on horse racing. TAB programmes are also broadcast by Sky, in both analogue and digital formats.

TelstraSaturn

20 Saturn Communications commenced broadcasting in the early 1990's on the Kapiti Coast through a small cable network operation. After investment by major offshore cable operators, the network was expanded to cover most of Wellington. Digital cable rollout is currently being undertaken in both Christchurch and Auckland.

Māori Broadcasting

21 The Government introduced the Māori Television Service Bill into Parliament in December 2001. The principal function of the service is to promote te reo Māori me nga tikanga Māori (Māori language and culture) through the provision of a high quality, cost effective Māori television service, in both Māori and English. The establishment of the Māori television service is currently being progressed by a trust, elected through an electoral college. The Government has reserved UHF radio spectrum for the promotion of Māori language and culture. This is to be transferred to the Māori television service once the Māori Television Service Bill is enacted.

Regional Television

22 There are several non-commercial regional broadcasters currently operating around the country. The regional broadcasters tend to operate on non-commercial (gifted) licences, and fund their broadcasting through a mix of advertising, sponsorship and donations. Some other local stations operate on a fully commercial basis, using purchased licences.

Recent Industry Developments

23 Sky commenced its digital satellite service in December 1998. It now offers 42 digital television channels, including information and pay per view channels, along with several radio channels. Sky uses several types of set top box, each with different functionality. To receive Sky services (with the exception of TV One and TV2, see below), the viewer must lease a set top box from Sky.

24 In early 2000, Television New Zealand sought Government approval for the implementation of a digital data network for free to air/pay tv services using spectrum at 12 GHz. This was subsequently declined by Cabinet.

25 In November 2000, Television New Zealand and TelstraSaturn announced their intention to form a joint venture company to provide digital television services by satellite. These plans have subsequently been deferred.

26 After lengthy negotiations, Television New Zealand and Sky agreed that from 1 December 2001 Television New Zealand programming will be carried on the Sky platform but without encryption (unlike Sky's pay tv programmes which use a conditional access system). Accordingly, TV One and TV2 are available to any purchasers of an appropriate set top box. At present, TV3, TV4, and Prime continue to be encrypted and only accessible in digital format through the Sky set top box on a subscription basis. TV One, TV2, TV3, TV4 and Prime are available in digital format, but without additional pay tv programming, on a low-cost Sky subscription of \$17/month.

Overseas Experience

27 A summary of the steps taken in Australia, Canada and the United Kingdom to manage the transition to digital television is given below. In each of these countries implementation has not been without technical difficulties and unforeseen shifts in overall policies. A more detailed discussion is contained in Appendix 1.

Australia

28 The Australian Government has actively managed the transition to digital television broadcasting. Digital broadcasting was required to be initiated in the five major metropolitan areas on 1 January 2001, and between 1 January 2001 and 1 January 2004 in all other areas. Simulcasting of analogue signals must be maintained for at least eight years, whereupon the situation will be reviewed. During most of the simulcast period, no new broadcasters will be permitted to enter the market. From 1 January 2003, all networks in the five major metropolitan areas will be required to broadcast at least 20 hours/week of high definition television.

Canada

29 The Canadian Government has created a voluntary transition model. While no mandatory simulcasting period has been established, broadcasters are expected to maintain analogue transmissions until the end of the transition period. During this transition period, broadcasters are permitted to broadcast up to 14 hours/week of programming that is exclusive to their digital network. As with analogue transmissions, at least 50% of this unduplicated programming must be Canadian content. If possible, it is expected that broadcasters will transmit in high definition mode.

United Kingdom

30 The United Kingdom has adopted a more market-based approach for the transition to digital broadcasting, although the Government still retains regulatory control in some areas. Analogue transmissions will not be switched off until the overwhelming majority of people have access to digital services. This will be examined between 2006 and 2010. The United Kingdom Government has stated that it does not wish to mandate particular transmission and equipment options, but rather encourage viewers to make their own choices. However, it has expressed concern that a solely market-based conversion to digital risks leaving some households behind, extending the “digital divide”. It has also agreed to an expanded programme offering from the BBC using digital technology.

Policy Context

Government Goals

31 The Government has set itself a number of high-level goals to guide the general formulation of policies. At least two of these goals are relevant to the subject matter under discussion:

“To grow an inclusive, innovative economy for the benefit of all”; and

“To strengthen national identity and uphold the principles of the Treaty of Waitangi”.

32 In broadcasting, and communications more generally, these goals are given effect through the provision of open and competitive markets, and the provision of funding and other support in certain circumstances.

33 The Government has signalled that it wishes more emphasis to be given to the promotion of New Zealand's national identity through broadcasting, including the promotion of Māori language and culture. This change of emphasis has been reflected in decisions to reset the objectives of Television New Zealand and to adopt a charter, and to strengthen and advance proposals for a Māori television service. Decisions taken by Government to date are not repeated here, but are available from the Minister of Broadcasting's website: <http://www.executive.govt.nz/minister/hobbs/index.html>.

34 Recent decisions in relation to the use of the radio spectrum, especially in FM radio broadcasting, also reflect the Government's approach to strengthening national identity.

Initiatives to Promote the “Knowledge Economy”

35 The Government has stated its desire to promote the development of a knowledge economy in New Zealand, to provide greater economic and social benefits to all New Zealanders. Electronic commerce and the educational opportunities offered by the internet have an important role to play in this regard.

36 A well-developed information and communications technology infrastructure is necessary to make the most of these opportunities. There is increasing demand on such infrastructure to support increased data traffic (video, internet, etc) across New Zealand and beyond at high speed. The availability of, and access to, adequate bandwidth is a key input to these future requirements.

37 In September 2001, the Government adopted the goal “that all New Zealand communities are able to access two-way, high-speed internet services by the end of 2003”.

38 Digital television is linked to this objective because the technologies used to provide television programming are also capable of providing other forms of information content such as graphics, sound, text and voice. It is therefore likely that in the future, “television sets” may instead be regarded as “screens” which receive not only television programmes, but a full range of digitally-delivered services including the internet.

Regulatory Framework for Broadcasting

39 Since 1989, there have been no restrictions on who may enter the market to provide broadcasting services in New Zealand. The only government-imposed constraints on commercial broadcasters have been the need to acquire suitable radio spectrum, to comply with provisions of the Commerce Act and to meet programme content standards. In practice, these have not been significant limiting factors, with the possible exception of access to spectrum for radio broadcasting in certain areas.

40 New Zealand's broadcasting regime is underpinned by three independent bodies:

- the Broadcasting Standards Authority, which maintains standards of good taste and decency through the exercise of quasi-judicial functions;
- NZ On Air, which promotes New Zealand identity and culture by helping to fund programmes and related initiatives;
- Te Mangai Paho, which specifically promotes Māori language and culture through funding assistance.

41 Since 1989, Television New Zealand has operated as a state-owned enterprise with a commercial focus. The Government has announced that Television New Zealand is to be restructured into a Crown company with the objective of giving effect to its charter while maintaining its commercial performance.

42 The Government has not made decisions on how Television New Zealand's requirements under the charter will be funded. A discussion of possible implications for NZ On Air can be found in "New Technologies and the Digital Future", a report commissioned by NZ On Air from the New Zealand Broadcasting School and the Christchurch Polytechnic Institute of Technology: <http://stage.morsemedia.com/nzonair/pag.cfm?i=459>.

Radio Spectrum Management

43 A new system for managing the radio spectrum was introduced in 1989 to complement the opening up of broadcasting and telecommunications markets.

44 As well as traditional administrative licensing, the Radiocommunications Act provides for a scheme of tradable legal rights in relation to radio spectrum. The Act provides a two-tier scheme of rights: nationwide management rights, and geographically-specific spectrum licences.

45 Only the Crown can create such rights in the first instance, and it is open to the Crown to decide how such rights are to be made available to interested parties.

46 Consistent with the objective of ensuring that spectrum is held by those who value it the most, thus maximising the value of spectrum to society as a whole, the Government has auctioned rights in commercial demand. These have generally taken the form of management rights, except in radio and television broadcasting where the Crown has auctioned spectrum licences only.

47 The Crown has reserved radio spectrum for a range of non-commercial broadcasting purposes, including Māori television and regional television. The spectrum concerned has generally been made available either by way of administrative or spectrum licences. It should be noted, however, that in the case of the proposed Māori television service, the Government intends to transfer a management right suitable for a nationwide UHF service, thus giving Māori full discretion over how that service is implemented.

48 The implications of digital broadcasting for existing commercial broadcasters, and for Māori television and regional television, are discussed further below.

49 In the recent auction of 2 GHz radio spectrum, the Government decided to limit the amount of spectrum that could be acquired by a single entity at auction and for a period of three years after the auction. The practice of imposing such restrictions as part of the auction process is regularly used in a number of countries including Australia, and may also be used in subsequent auctions in New Zealand.

50 The Government has considered its policy of what should happen when existing rights expire at the end of their terms, and expects to make announcements on this matter in the new year. The first set of rights to expire will be those held by UHF television broadcasters, followed by those held by commercial telecommunications operators and radio broadcasters. The future of rights at their expiry is clearly of central importance if the allocation of any new rights and associated new investments are to occur in the meantime. This matter is also discussed further below.

51 Early in 2000, the Government considered and declined a request from Television New Zealand to proceed with a terrestrial digital data network utilising radio spectrum at 12 GHz. The possible allocation of 12 GHz spectrum is discussed below.

Telecommunications Inquiry

52 As part of its report, the Ministerial Inquiry into Telecommunications noted the important role that Sky's digital network could play in bringing electronic communications services to remote and low population-density areas. It noted that Sky had an important role in enabling all New Zealanders to have access to broadband services, and that it had every incentive to improve its market penetration to this end.

53 The Inquiry was not convinced that the pricing of Sky's services should be regulated, opting instead for the development of an approved code of practice allowing industry input into any changes proposed by Sky to its conditional access system.

Previous Government Decisions

54 In September 1998, the then Ministry of Commerce issued a discussion paper entitled "Digital Terrestrial Television: Spectrum Allocation Options" (DP13). This focused on radio spectrum issues in general, and digital terrestrial television in particular.

55 The previous Government subsequently decided that:

- an auction of UHF spectrum suitable for digital television would be held at the earliest opportunity (timing was contingent on the 2 GHz auction);
- spectrum would be reserved from the auction, “sufficient” to permit free to air broadcasters to “simulcast” existing analogue services in a digital format;
- this reserved spectrum would be made available to free to air broadcasters on a shared basis to conserve the amount of spectrum required;
- a resource rental based on prices realised at auction would be payable for the reserved spectrum;
- special limits on how much spectrum could be acquired in the auction were not needed, i.e. normal Commerce Act rules would apply.

Issue 1: Technology Choices

Transmission Platforms

56 Four potential technology choices, or platforms, have been identified as suitable for the implementation of digital television. Each of these platforms has different potential in terms of programming capacity, geographical coverage, and interactivity. Each is also different in terms of likely cost to broadcasters and viewers.

57 The platforms that can be used to deliver digital programming are as follows:

- satellite transmission (adopted by Sky in New Zealand);
- cable (copper, fibre or hybrid fibre-coax as used by TelstraSaturn);
- terrestrial UHF transmission (known as digital terrestrial television as commenced in Australia, the United Kingdom and some other countries);
- terrestrial transmission at 12 GHz (known as Digital Data Network).

58 In addition to delivery platforms, there are a number of standards suitable for the implementation of digital television. The Digital Video Broadcasting (DVB) standards are a “family” of technical standards adopted in Europe and, in modified form, Australia. Standards New Zealand formally adopted the DVB standards earlier this year (NZS6610:2001). While there is not a mandatory requirement to use NZS 6610, there is now an agreed technical basis for new services to be introduced.

59 Within the DVB standards, there are technical differences relating to the transmission platforms adopted. These differences have meant that there is currently no universal set top box able to receive all of the different standard signals. Accordingly, at least in the short term, viewers wishing to receive more than one service (for example, satellite and cable) will be required to have two set top boxes.

60 Digital transmission standards adopted in North America (Advanced Television System Committee) are reputed to be difficult to implement. Receivers manufactured to the ATSC standard are believed to suffer difficulties relating to multi-path reception of signals. The multi-path performance of digital television receivers is of great importance given New Zealand’s rugged topography. Accordingly, Standards New Zealand has not favoured the ATSC standard for use in New Zealand.

61 In addition to the use of specific standards for the transmission of digital signals, standards also exist for the software used to interpret the signals and to provide for the operation of interactive and enhanced television applications. This software is known as “middleware”. An arrangement between Sky and the free to air broadcasters, including Television New Zealand and CanWest, provides for the use of a proprietary middleware product called “open tv”. While suitable for the short or medium term, it is possible that future integrated digital television receivers will be fitted with an alternative, non-proprietary middleware product called “multimedia home platform” (MHP) currently being developed and promoted by the same group responsible for the development of the DVB standards.

Service Capabilities

Satellite

62 The bandwidth capacity of a satellite is determined at the design and launch stage and is fixed for the economic life of the satellite. Improvements in digital compression will allow greater capacity in a given bandwidth, but an established base of receivers such as is used in a satellite television service may limit the application of such improvements. Expansion of satellite services is usually achieved through leasing of any suitable unused transponders, or replacement of the satellite. Bandwidth availability for a new satellite depends upon successful international co-ordination at the desired orbital location.

63 There is currently only one satellite with a suitable footprint over New Zealand (the Optus B1 satellite). The Optus system is an Australian-based satellite network, owned by Singapore Telecom. Sky uses the satellite to provide around 40 programmes. Television New Zealand and TelstraSaturn have access to capacity that would provide approximately 24 further programmes. While Television New Zealand and Sky have made arrangements relating to the carriage of TV One and TV2 programmes on the Sky satellite platform, there is little information available on likely future use of the remaining satellite capacity.

64 Implementation of satellite services provides immediate coverage of the New Zealand landmass. Satellite technology is proven to be reliable, although reception may be periodically affected in areas with high rainfall.

65 To date, it has not been economic to provide two-way interactive services in New Zealand through the satellite itself. Some interactivity is provided by using the viewer's telephone system as a return path, however.

Cable

66 Cable facilities provide the greatest ability to provide large bandwidths at the time of installation, or roll out. Cable offers the greatest potential for interactivity through a return path of higher bandwidth than can be provided by a telephone line. Once installed, however, adding to cable services can be difficult. Cable and telecommunications operators are continually striving to develop technology to improve the capacity of their systems without total replacement.

67 Because the implementation cost of cable services is very high, companies will typically only deliver services either where there is high density housing, or where they can identify a high "take up" rate for their services prior to roll out.

Terrestrial (Digital Terrestrial Television and Digital Data Network Services)

68 Digital terrestrial television has relatively small capacity in New Zealand, particularly while analogue transmissions continue in the UHF band. There is capacity for up to six digital channels within the present UHF television bands, each with four or five programmes in most areas. However, there is presently no additional capacity in Wellington for digital terrestrial television, and capacity for only three channels in Christchurch, unless changes to existing analogue licences are negotiated.

69 Digital data network (DDN) systems operate in similar frequency bands to satellite services. They also have similar bandwidth availability. An important difference, however, is the ease of access to provide augmentation of the transmission services whenever necessary. It is estimated that up to 60 programmes of television may be available from the start-up date.

70 Implementation of digital terrestrial television and digital data network services depends upon commercial decisions taken by the broadcaster. In the past it has been economic to provide UHF television broadcasting to around 75% of New Zealand households. It is understood that the likely commercial coverage of digital data network services might extend to around 60% of households. Clearly it is cheaper to provide these services to urban rather than rural communities. Greater levels of coverage would require significant subsidies to meet the added capital and operating costs.

71 Both digital terrestrial television and digital data network services require a separate return path, typically provided through the viewer's telephone connection, if any interactive services are to be implemented.

In what circumstances, if any, is Government intervention in the choice of technology used to implement digital television justified?

1.1 Does the Government have a role to play in promoting or preventing one or more of the identified technologies used to transmit or receive digital television?

1.2 If so, what objectives should the Government be seeking to achieve, and what interventions should it consider to achieve those objectives?

Issue 2: Spectrum Allocation

72 A key resource issue to be addressed in the transition to digital television broadcasting is the allocation of suitable spectrum. The underlying aim of the spectrum management framework encompassed in the Radiocommunications Act is to ensure that spectrum is allocated to uses which society values the most. The Act does not specify, however, what spectrum should be allocated, or when and how this should be done. The Government retains the flexibility to decide these questions in light of underlying policy objectives.

73 As noted earlier, digital television can be provided via four transmission technologies: satellite, cable, and two types of terrestrial transmission. Suitable spectrum is a prerequisite for transmission via satellite and terrestrial technologies, which involve the transmission of electromagnetic radiation through the air to a receiver in the home. By contrast, cable transmission does not require radio spectrum because the signals are transmitted via a cable linking the transmitter to subscribers.

74 With the move to digital television, existing broadcasters may, generally speaking, require spectrum for two distinct reasons:

- to allow for the roll out of new programmes or services, such as interactive television, which digital technology makes possible;
- to enable simulcasting of existing analogue free to air services in digital format, until such time as digital television receivers and/or set top boxes become the norm.

Spectrum for Satellite Television

75 Satellite transmissions are managed through an international framework that requires co-ordination of the location, frequency, and coverage areas of existing and planned satellites. The Radiocommunications Act does not apply to satellite transmissions which occur from outside New Zealand territory.

76 New Zealand can licence terrestrial use in frequency bands otherwise used for reception of satellite transmissions, however. Where the up-link originates within New Zealand, there is an ability to control the down-link through licensing of the up-link. To date, spectrum used for satellite services has been managed through administrative licences. Where up-links are licensed, appropriate protection to the down-link frequencies is given by excluding other services as necessary.

77 New Zealand is required under the International Radio Regulations to enter into co-ordination procedures when proposed satellite services might affect New Zealand terrestrial usage. These procedures may ultimately lead to a requirement to modify existing terrestrial licences. Radio licences provide the flexibility to facilitate this type of modification, but there are not clear criteria to determine whether a planned satellite or an existing terrestrial service should be afforded priority. The current use of radio licences does not permit a competitive allocation to ensure that spectrum is held by those who value it the most.

78 Where competing terrestrial services are operated both under commercially acquired spectrum rights and under administrative licences, there will be differences in the costs incurred to access the spectrum.

79 The main existing satellite suitable for digital television coverage of New Zealand is the Optus B1 satellite (160 deg east) which has a down-link in the 12.2-12.75 GHz band (eight transponders) and corresponding up-links at 14 GHz. Both Sky and Television New Zealand-TelstraSaturn have leases of transponder capacity (five transponders) on the Optus satellite. The remaining three transponders are suitable for either broadcasting satellite or fixed satellite uses. At present a mix of fixed satellite and terrestrial uses are licensed in this bandwidth. These are co-ordinated individually based on their geographic locations. It is difficult to determine if the present licences present an optimal allocation of this spectrum.

80 A number of terrestrial licences have been granted for digital data network service in the 12 GHz bands, but most of these have been unused for a number of years. This innovative service involves the use of satellite transmission technologies and receiving equipment, but from terrestrial locations. The use of satellite derived technology effectively requires operation in the same bands as used for actual satellite transmissions. It is therefore necessary to determine whether terrestrial, satellite or a mixture of uses should be permitted in these bands. There are four potential uses in the 12 GHz band for essentially the same spectrum, viz:

- fixed satellite service;
- broadcasting satellite service;
- digital data network;
- fixed service.

81 Appendix 2 to this paper shows, in diagrammatic form, the current uses of the 12 GHz bands in New Zealand.

82 Depending upon antenna size, satellite location and other technical parameters, it is possible to utilise two or more satellites at different orbital locations within the same frequency band. It is also noted that from a technical perspective, a satellite transponder may be used for either fixed satellite or broadcasting satellite uses with very little difference in the actual transmission. From a licensing perspective there is an obvious difference in the receiving area required.

83 Typically, where demand exceeds supply, or the highest value use is unclear, spectrum rights are allocated through a competitive process (auction). The use of a competitive process may be difficult in bands allocated to satellite services, due to the international co-ordination framework and the fact that the satellite is outside New Zealand's jurisdiction. In addition, mere access to the spectrum by a party within New Zealand may not ensure that transponder leases can be acquired by that party. At present, a planning process is used to effectively segment the band according to the demand foreseen at the time of planning. This approach currently relies on consensus between interested parties, but if necessary could be reinforced through Government policy decisions and directions under the Radiocommunications Act.

84 In future, other frequency bands or orbital locations may be utilised for satellite services. In particular the lower adjacent band 11.7–12.2 GHz may be considered. This band is planned internationally for broadcasting satellite services but, depending upon successful international co-ordination, may also be used for additional satellite services.

85 The overall band 11.7–12.75 GHz is also suitable for terrestrial use for both fixed links and digital television (digital data network) services. A number of licences suitable for a digital data network have been granted within the lower part of this band. The Ministry has no conclusive information regarding whether to permit either satellite or terrestrial uses in these bands. One section of this band is under a Ministerial direction which limits licensing of that part of the band.

Spectrum for Terrestrial Use (Digital Terrestrial Television and Digital Data Network)

86 A previous Ministry of Commerce discussion paper entitled “Digital Terrestrial Television: Spectrum Allocation Options” (DP13) identified two parts of the spectrum as suitable for digital terrestrial television:

- “interleaved” channels located between 518-582 MHz, and 646-806 MHz within the UHF band. New digital transmissions would be inserted into the gaps between adjacent channels 27-34 and 43-62 used for analogue television transmissions;
- two unused channels at 502-518 MHz (channels 25 and 26).

87 The main points from that paper are repeated below. The paper was not concerned with spectrum reserved for either Māori television or non-commercial (regional) television, as these services have existing reservations which are generally suitable to support both analogue services and digital services in any given area.

88 The paper noted that heavy usage of VHF channels by analogue terrestrial television meant that there was unlikely to be sufficient capacity within that part of the spectrum to accommodate the insertion of additional digital services without creating interference.

89 Since the paper was published in 1998, further work has identified a number of technical issues in the UHF bands. In particular, the levels of protection afforded existing analogue licences (termed MPIS levels) would constrain, and in some areas severely limit, the creation of digital licences giving optimum coverage. It appears that the MPIS levels could be altered without any practical effect on the analogue services, but this would need to be negotiated individually with the existing rightholders.

90 The potential for digital data network type services providing digital television have been noted earlier in this paper.

How Should Spectrum be Allocated?

91 The Government’s primary objective in managing radio spectrum is to maximise the value of spectrum to New Zealand society as a whole. In order to achieve this, spectrum management policy has aimed to:

- ensure that spectrum is allocated to highest value uses;
- provide sufficient exclusivity of use to enhance the value of particular parts of the spectrum;
- provide security of tenure to encourage spectrum-related investment;

- provide a reliable means to resolve interference problems with minimal transaction costs;
- ensure that concentration of control of the spectrum does not unnecessarily inhibit competition.

92 As noted above, the Radiocommunications Act establishes a scheme of long term tradable rights in relation to spectrum, as well as providing for the continuation of traditional administrative licensing. Rights in relation to spectrum exist at two levels:

- management rights in relation to certain designated ranges of frequencies throughout New Zealand;
- spectrum licences, which may only be granted by management right holders, and which permit the use of certain frequencies at specified locations or areas.

Management Rights

93 Management rights give the manager an exclusive right to determine the use of the band concerned and to create and allocate licences within it. This option relies most heavily on the market to resolve the future use to which spectrum is put. It offers the advantage of being the most economically efficient and flexible solution (by ensuring that spectrum is used for the highest value purpose). It also frees the Government from having to determine spectrum use and licensing frequencies for digital terrestrial television and analogue terrestrial television to ensure technical compatibility. This is a particular issue in relation to digital terrestrial television where there is little prior experience in managing spectrum for digital services. It is noted that initial digital services overseas have required adjustments to both digital and analogue licences to improve their compatibility with each other.

94 Broadcasters have suggested that management rights can potentially give rise to a conflict of interest situation, where the band manager is also a user of parts of the spectrum. The concern is that in such circumstances the band manager may not be prepared to deal impartially with competitors licensed within the band, for example in defining acceptable technical parameters for licences, or permitting technical variations to licences once issued. Broadcasters have argued that the Government should retain management rights, as it is perceived as a neutral band manager.

95 A further generic issue in relation to management rights is the role of the Crown as band manager. In the event that private management rights were more generally employed as the means of allocating spectrum (as opposed to spectrum licences), the position of the Crown as a band manager could be perceived as anomalous.

Spectrum Licences

96 Spectrum licences would address these immediate concerns in relation to digital terrestrial television, as the Government would continue to retain management rights for digital terrestrial television spectrum and would simply allocate licences within the bands concerned. Spectrum licences also provide greater certainty over the use to which spectrum is put, as they are issued within more tightly defined technical parameters, being location and technology-specific. They do, however, rely on the Government to make decisions on the

most effective use of the band, and to ensure technical compatibility of licences. They would also mean ongoing administrative costs for the Government.

97 Primarily because of the greater flexibility which management rights provide to users of the spectrum, the Ministry has in the past favoured the use of management rights for spectrum suitable for digital television, rather than spectrum licences.

Market-Based Allocation Options

98 The 1998 discussion paper set out four allocation options for digital terrestrial television:

I Grouping UHF channels into nine management rights to be auctioned as follows:

LOT	FREQUENCY RANGE	UHF CHANNELS	INCUMBENT USE
1	502-510 MHz	25	Nil
2	510-518 MHz	26	Nil
3	518-550 MHz	27-30	Analogue Terrestrial Television licences
4	550-582 MHz	31-34	Analogue Terrestrial Television licences
5	646-678 MHz	43-46	Analogue Terrestrial Television licences
6	678-710 MHz	47-50	Analogue Terrestrial Television licences
7	710-742 MHz	51-54	Analogue Terrestrial Television licences
8	742-774 MHz	55-58	Analogue Terrestrial Television licences
9	774-806 MHz	59-62	Analogue Terrestrial Television licences

This option carried with it the possibility of limiting the number of management rights that one person could acquire at auction. It should be noted that the spectrum between blocks 4 and 5 above has been reserved for Māori and non-commercial broadcasting.

II Auction of two management rights representing channels 25 and 26

Under this option, the Crown would retain the management rights to channels 27-34 and 43-62. This would preserve the option to release long-term digital terrestrial television spectrum licences through auctions as the technical basis for analogue terrestrial television and digital terrestrial television interleave became more clearly established. Again, this option carried with it the possibility of disallowing any one person from acquiring both management rights.

III Auction of spectrum licences

Under this option, the Crown would retain the management rights to channels 27-34 and 43-62, and auction spectrum licences technically defined for digital terrestrial television transmissions interleaved with existing analogue services. The auction could also include digital terrestrial television licences in channels 25 and 26. Again, limiting the number of licences any one person could acquire was raised as a possibility, particularly where those licences serve main centres.

IV Auction of management rights and spectrum licences

Essentially this was a combination of options I and II. Again, limiting the number of management rights or licences any one person could acquire was raised as a possibility.

99 Most submissions on the discussion paper supported the Crown retaining management rights and auctioning only spectrum licences, i.e. option III. The Ministry's preference following the 1998 discussion document was option I or option II.

100 An important consideration impacting on both the nature and the timing of allocation is the Government's policy on how existing management rights and spectrum licences are to be treated on their expiry. Licenses for UHF spectrum are due to expire in early 2010. It is expected that the Government will decide and announce its policy on the treatment of such rights early in 2002.

101 Licences that have been engineered for the present analogue television service would need adjustments in order to be suitable for a digital service. The Government has not yet developed policies in relation to this process. The parameters of replacement licences could be considered after expiry of rights, but may need to be considered at an earlier date.

Allocation of Spectrum to Existing Broadcasters for Simulcasting

102 Existing free to air broadcasters have in the past raised the issue of whether spectrum suitable for the simulcasting of existing free to air analogue services in digital format should be managed separately from an auction process. They have argued that they should be granted spectrum at no cost to enable existing analogue terrestrial television programmes to be simulcast in digital format, given that there will be a long period (around 10 years) during which both analogue and digital receiving equipment will be in use. Broadcasters will face increased investment costs, but will not be able to generate additional revenue through simulcasting.

103 Free to air broadcasters have observed that other countries, such as Australia, the United States and United Kingdom, have adopted a managed approach to the allocation of spectrum for free to air broadcasters. It should be noted, however, that other countries' spectrum allocation policies generally differ substantially from New Zealand's in relying more heavily on managed outcomes overall, as opposed to a market-based allocation approach.

104 In support of their proposals, free to air broadcasters commissioned a report from the New Zealand Institute of Economic Research (NZIER) and McKerbies Consulting, an Australian group specialising in broadcasting related work. The report indicated that it would cost broadcasters approximately \$150 million over a ten year period to implement digital terrestrial television. At a recent industry seminar on digital television, however, the managing director of TV3 estimated the roll out of a digital terrestrial network covering 70% of New Zealand's population as costing in the order of \$14 million.

105 There are at least three potential options for addressing the transitional issue, viz:

- I* licensing each existing free to air broadcaster;
- II* shared use of spectrum reserved by the Government;

III normal market-based allocation mechanisms with no special arrangements.

Option I: Licensing each existing free to air broadcaster

106 This option would involve:

- the Government assigning spectrum to free to air broadcasters for a period of 10 years for the purposes of simulcasting. Digital services would have to commence within a specified period (say, two years);
- the spectrum would comprise three 8 MHz channels in any given area (for example one for TV One and TV2; one for TV3 and TV4; and one for Prime TV, TAB and other national/regional free to air services);
- free to air broadcasters would be permitted to use any “spare” capacity within this resource (i.e. spectrum not required for simulcasting) for the introduction of new services, and would pay normal commercial rates to the Government for the use of such capacity;
- once provision had been made for free to air broadcasters, the Government would auction spectrum licences for any remaining digital spectrum. More recently, proposals have been advanced that no additional broadcasters should be permitted to commence new services, i.e. a restriction of market access to the existing broadcasters for a transitional period.

107 These proposals would create certainty for existing free to air broadcasters over access to spectrum for simulcasting existing analogue terrestrial television programmes in digital format. They would also avoid any perceived risk that may arise from a “hostile” band manager. The cost of the digital transition for existing free to air broadcasters would be minimised, as they would not need to purchase spectrum at auction. Actual transmission costs for simulcasting may, however, be higher than under the shared spectrum option.

108 Restriction of market access would not necessarily promote the new programming streams desirable to popularise the uptake of digital services, however. Furthermore, it is not generally Government policy to subsidise the introduction of new technology. The proposal also involves unequal treatment for different market participants. Providing spectrum to a particular group could create a precedent, with implications for the wider spectrum allocation process (e.g. in telecommunications or when existing broadcasting licences expire). It might also be argued that there is no reason to believe free to air broadcasters could not obtain spectrum for simulcasting at auction, or that the cost of doing so would be prohibitive.

109 The UHF bands also accommodate licences used for pay tv services that were acquired on the same basis as UHF licences used for free to air broadcasting. It is debatable whether a section of the industry should receive a preferential spectrum allocation simply because it elected to use advertising revenues, rather than subscription revenues, to receive a return on investment.

Option II: Shared Use of Reserved Spectrum

110 An alternative approach to managing the transition to digital terrestrial television would be to reserve one or two 8 MHz channels (depending on technical and engineering requirements). This spectrum would be shared by all free to air broadcasters who wished to use it for the simulcasting of existing analogue terrestrial television programmes. Broadcasters would need to co-operate and co-ordinate the multiplexing of their respective programmes onto transmitting installations.

111 If such an approach were adopted, it is envisaged that broadcasters would pay a resource rental for use of the spectrum. This could be based on prices realised at auction for non-reserved spectrum, or determined by a prescribed formula. An example could be the transitional provisions of the Radiocommunications Act which prescribed a payment of 1.5% of revenue, or a capitalised equivalent, when existing broadcasters were granted 20 year tradable rights in lieu of their administered renewable licences.

112 This option has the advantage of ensuring that spectrum will be available for simulcasting. It would minimise the amount of spectrum that would need to be set aside from an auction. Broadcasters would have an incentive to compete for spectrum at auction, as the sharing arrangement for the reserved spectrum would offer less flexibility over the use of the spectrum than direct ownership. This option would leave a majority of channels available for auction. In addition, if the spectrum reserved for shared use by free to air broadcasters was not required for simulcasting it could be sold.

113 On the other hand, this option would not enable enhancements such as simulcasting with high definition television to be introduced. In addition, as not all free to air broadcasters use the same transmission sites and as digital licences would use UHF frequencies, the coverage gained by some broadcasters would be somewhat different from their existing analogue terrestrial VHF television coverage. Broadcasters may also have different timetables for the roll out of digital terrestrial television. In a multiplex arrangement, one broadcaster could therefore delay the plans of others.

114 Further disadvantages of this option are that it would not be consistent with the general approach of allowing spectrum to be acquired by those who value it the most, and that it would result in a loss of potential revenue to the Government.

Option III: Normal Market-Based Allocation Mechanism

115 Under this option, all spectrum suitable for digital terrestrial television would be allocated through the usual auction process. No special provision would be made for free to air broadcasters, who would need to bid for spectrum against other potential buyers. The advantages of this option are that it:

- is consistent with current spectrum allocation policy;
- treats all market participants equally;
- gives incentives to broadcasters to plan investment for technological change on a fully commercial basis;

- imposes no additional costs to the Government in terms of revenue foregone on reserved spectrum and ongoing administration of shared spectrum;
- avoids creating precedents for future allocation of other spectrum.

116 The disadvantages of this approach are that:

- free to air broadcasters may not all obtain spectrum at auction, limiting the ability of some to simulcast, or requiring negotiated access to other multiplex transmissions; and
- it does not provide complete certainty that free to air broadcasters will be able to move to a digital terrestrial television environment. It is likely, however, that the broadcasting industry will wish to remain abreast of international trends in response to consumer demand for enhanced broadcasting services and technical quality.

117 It should be noted that spectrum which is auctioned may still be subject to acquisition limits imposed by the Government as part of the auction rules. Such limits, which aim to ensure a broader allocation of spectrum than might otherwise occur, could, depending on how any limits were designed, have the practical effect of ensuring that most or all free to air broadcasters did receive at least some spectrum.

118 Concerns about free to air broadcasters not acquiring spectrum under a market allocation may be able to be addressed by conditions requiring certain spectrum under auction to be used on a free to air basis. This could provide a more efficient allocation of spectrum than a gifted allocation, by ensuring that the spectrum was acquired by those free to air broadcasters who valued it the most. This illustrates the variety of allocation methods that might be possible beyond the three options identified above.

Competition Issues

119 Free to air broadcasters have argued in the past that the spectrum suitable for digital television is of such strategic importance to their future survival that the Government should take special measures to ensure a fair outcome. In Australia, the position of denying all others access to the market has been adopted. In New Zealand, arguments have been advanced that the Government should restrict the number of lots that can be acquired at auction by any single entity, thus pre-empting normal Commerce Act processes that apply to the acquisition of assets of a business. Acquisition limits could extend beyond the initial auction to cover secondary trading in spectrum for digital terrestrial television.

120 One view is that for free to air broadcasters to remain profitable in the future, they may need to complement free to air broadcasting with a range of new, value-added and interactive services, supported by a digital terrestrial network. Access to spectrum suitable for digital terrestrial television will be essential for this purpose. It is therefore undesirable for a controlling share of the spectrum to be obtained by a single firm. Such a firm may seek to acquire spectrum to prevent the roll out of new services by competitors, thus delaying consumer benefits in terms of lower prices and enhanced service offerings. Further it may be desirable to ensure that the spectrum supporting public information services is not controlled by one firm. Implicit in this argument is that the Commerce Act would not prevent a firm from acquiring a degree of market power likely to be harmful to the interests of the viewing public generally, and those of the economy as a whole.

121 The opposing view is that if digital terrestrial television spectrum is strategically important to free to air broadcasters, they can be expected to compete vigorously for it at auction. Moreover, it is not clear at this stage whether free to air broadcasters will seek to diversify their present services, thereby increasing their requirements for spectrum. This will depend on the business case for such services. In turn, this will be influenced by such factors as access to suitable programming, and access to New Zealand homes through set top boxes.

122 A further significant factor is that simulcasting will result in additional costs for free to air broadcasters with no associated increase in revenue. It is possible that the free to air broadcasters will continue to concentrate on their core business, relying on their ability to broadcast programmes free to air that reach the largest possible audiences, thus generating maximum advertising revenue. Access to high rating programming, especially sports and certain New Zealand-produced programmes, will be critical to this end.

123 Television New Zealand (and its subsidiary, Canterbury Television and/or BCL) already hold some spectrum that could be used for digital terrestrial television. The free to air broadcasters will also have additional capacity available to them in VHF or UHF bands at the end of the transition to digital broadcasting in say 10 years' time, i.e. when their existing spectrum can be used more efficiently in digital-only format.

124 Other delivery platforms for digital television are also available. Digital television is already being provided in association with Ihuq internet services using 12 GHz frequencies, and direct to home services are provided directly to some New Zealand homes by Sky.

Application of the Commerce Act

125 In allocating spectrum, the Government has traditionally relied on the Commerce Act to promote competition in broadcasting markets. Section 47 of the Commerce Act prohibits acquisitions of business assets that are likely to result in a substantial lessening of competition in a market. The Radiocommunications Act deems management rights and spectrum licences to be assets of a business for the purposes of section 47.

126 The Commerce Commission is the regulatory body with responsibility for enforcing the Commerce Act. The Commission is required to grant clearance to an acquisition if it is satisfied that it will not have the effect described in section 47. It is required to grant an authorisation if the acquisition will result, or will be likely to result, in a benefit to the public that would outweigh any detriment from the loss of competition. Decisions on acquisitions which may lead to competition issues are taken by the Commission following consideration of the views of all interested parties. The Commission has previously advised potential bidders in spectrum auctions that it expected that they would seek clearance or authorisation prior to the acquisition of spectrum if there were potential concerns regarding section 47.

127 The Commission has not yet considered section 47 in the context of digital terrestrial television. Essential to this consideration would be the definition of the relevant market, the application of relevant case law and the Commission's own guidelines on business acquisitions.

128 If the Commission were to authorise acquisition by a single party of all or most of the spectrum to be auctioned, it would need to be assured that the public benefits of such an acquisition outweighed any detriment from the loss of competition. Commission decisions can be appealed by the person who sought the approval, by the Crown as seller of the

spectrum or by any person who participated in a conference held by the Commission in considering the application.

Acquisition Limits

129 No legislation would be needed for the Government to limit the amount of spectrum that may be acquired by any one auction participant. Spectrum is a Crown asset and the terms of any sale are a matter for the Government to decide. Acquisition limits have been used in situations where the technology is relatively undefined, thereby making it difficult to determine end-use markets under the Commerce Act. Portions of the spectrum in the recent 2 GHz auction were subject to acquisition limits.

130 The advantages of acquisition limits include:

- ensuring allocation of spectrum amongst a range of parties, assuming that there is sufficient demand for the spectrum being offered;
- providing greater protection from the possibility of one or two players “hoarding” spectrum than reliance on the Commerce Act alone;
- avoiding cost and uncertainty associated with obtaining clearances to acquisition from the Commerce Commission.

131 On the other hand, disadvantages of imposing acquisition limits include:

- the risk of spectrum not being allocated to those who place the greatest value on it, and, therefore, of inefficient investment in downstream markets;
- difficulty in enforcing limits beyond the point of initial allocation for an indefinite period;
- limits may have the effect of depressing the price paid at auction;
- the Government may set the wrong restrictions on the initial acquisition of spectrum, given that it does not have perfect information on the intentions of auction participants. Such restrictions may therefore not have the intended effect of enhancing competition.

Should suitable spectrum for terrestrial use be allocated in due course, and if so, on what basis?

Spectrum for Satellite Television

2.1 Is the existing administrative licensing regime which applies to spectrum for satellite transmissions appropriate? If so:

- i Should any resource charge be considered to give greater equity vis-a-vis***

terrestrial broadcasters?

- ii How should the Ministry determine whether to provide terrestrial licences or to preserve and license the spectrum for satellite services?*

2.2 If administrative licensing is not appropriate, what is a preferable alternative?

Spectrum for Digital Terrestrial Television

2.3 What spectrum should the Government make available for terrestrial digital television services?

2.4 Should the Government allocate spectrum in the form of management rights, spectrum licences, or a combination of both?

2.5 Are the allocation options put forward in 1998 still valid?

2.6 What allocation of 12 GHz spectrum should be made?

Spectrum for Simulcasting

2.7 Should any special provision be made for existing broadcasters to manage the transition to digital television?

2.8 If so, should any such provision incorporate a requirement to implement particular transmissions in, and for, specified timeframes?

2.9 If so, are either of the options discussed above suitable, or are there further preferable alternatives?

Competition Issues

2.10 Is anti-competitive behaviour likely in respect of digital television services?

2.11 Are there any particular characteristics of spectrum suitable for digital television, or of broadcasting markets, which justify acquisition limits for spectrum over and above the Commerce Act safeguards?

2.12 If so, what are these factors and what form and level of limits are appropriate?

Issue 3: Analogue “Switch Off”

132 It is expected that present analogue services will be replicated on digital platforms, with a period of “simulcasting” when both existing analogue and new digital transmissions will be available to viewers. The choice of either analogue or digital reception would allow viewers to purchase digital receiving equipment at a time of their choice, perhaps when an existing television set was to be replaced. This choice would, of course, only occur in areas where digital services were available.

133 The operation of parallel analogue and digital transmissions in some areas will have added costs for broadcasters. At some stage it would therefore be desirable to discontinue analogue transmissions. Such a decision would normally involve an assessment of:

- the extent of direct viewer take-up of the digital technology;
- arrangements necessary to feed input signals to any remote, dependent translators;
- the present value of the existing transmitter and its remaining economic or technical life;
- the operational cost savings that are available from discontinuing analogue transmissions.

134 From a viewer perspective, it is desirable to have a relatively long period of parallel transmissions as this allows a choice of when to invest in digital technology and minimises the potential for unnecessary expenditure. Decisions on when to invest in digital reception capability will be influenced by:

- the attractiveness of other, non-simulcast, digital programming;
- the availability and cost of set top boxes and/or digital receivers;
- the serviceability of the existing television receiver.

135 Until a certain critical mass of viewers receiving digital transmissions is reached, broadcasters will have an incentive to continue analogue transmissions. Conversely it is difficult to foresee viewers purchasing digital equipment unless there are strong incentives to do so. In some cases, even once digital equipment is purchased, an analogue receiver may be relocated to another location (bedroom, holiday home etc). Many homes already have more than one analogue receiver.

136 A key question for the Government is whether a date for the termination of analogue services should be mandated (and if so, when and on what criteria), or left to the industry to determine. A related question is whether, as in Australia, broadcasters should be required to “simulcast” in both digital and analogue formats.

137 The rationale for Government action is that a clear termination date will:

- provide certainty for investment in digital services;
- set a limit on the cost of parallel digital and analogue transmission;

- encourage viewers to buy digital reception equipment.

138 A disadvantage is that any termination date set now would be based on limited information and may, in the light of actual experience, prove to be impracticable or unnecessarily severe. There have been technical or policy problems associated with virtually every implementation of digital technologies overseas, which have tended to push out projections for complete conversion to digital. Setting a termination date would also force viewers to invest in receiving equipment before a receiver would normally be replaced. This in itself may be difficult for some sections of the community. Legislation would almost certainly be needed to enforce a termination decision. Most governments overseas have turned away from setting a firm termination date, preferring instead to establish criteria or timeframes for the issue to be reviewed.¹

139 It is noted that the majority of the TV One, TV2, TV3, and TV4 services utilise VHF spectrum with licences that are due to expire in 2015. Other services (Prime, TAB, Sky terrestrial) use licences which expire in 2010. The Government is presently considering what policies should apply upon the expiry of these rights. These considerations recognise that a decision on the individual spectrum bands should be made prior to expiry, typically five years before expiry, to allow for certainty and appropriate investment decisions. Consideration of terminating analogue services could be linked to such reviews, although there may still be inadequate information available in 2005 (five years before UHF rights expire in 2010) to assist in determining any analogue termination issues in relation to UHF licences.

Should analogue services should be "switched off" at a certain date, and if so, what policies should apply?

- 3.1 *Should a policy of mandatory termination be established, and if so, at what time should the Government consider establishing the actual termination date, and what criteria should be used in determining the date? or*
- 3.2 *Should the termination issue should be left for industry to manage in light of their costs and viewer take up? or*
- 3.3 *Should the termination issue be left open, to be reviewed at a future date, and if so when should such a review be undertaken?*

¹ Australia has a minimum eight year requirement to maintain analogue services. The United Kingdom Government has said it would consider mandating termination of analogue services once 95% of viewers were switched to digital, possibly in the 2006–2010 period.

Issue 4: Reception in the Home

140 This section considers the technology required to receive digital television transmissions in the home. It addresses the underlying question of whether the Government has a role to play in ensuring viewers have “open access” to a range of free to air and pay tv services through a single receiving apparatus.

141 Reception of digital television requires the viewer to acquire either a set top box or other suitable digital receiving equipment (i.e. an integrated digital television receiver). In the short to medium term, the price of a set top box is likely to be significantly less than that of a digital television receiver.

142 New Zealand is a relatively small market and it is therefore unrealistic to expect particular set top box technology to be developed solely for New Zealand. Rather, it is expected that technologies developed and used in other markets will be used in New Zealand.

143 The following paragraphs highlight the complexity of the present technology, and the two competing arguments of standardisation and innovation. The advantages of adopting a “standard” set top box potentially run counter to continuing innovation and the provision of new interactive services through set top boxes.

Set Top Boxes

144 The differing propagation characteristics of various frequencies used for digital television have led to different transmission standards being developed internationally for UHF terrestrial, satellite and cable services. Currently, different set top boxes are required for each type of service.

145 Conditional access allows broadcasters to restrict viewers’ access to programming, and thereby provide pay tv or pay per view types of services. Conditional access can be integrated directly into a set top box or can be provided through a “plug in” module. There are several different proprietary products used for conditional access. In all cases, a set top box equipped with conditional access is likely to require an access card authorised by the service provider.

146 Set top boxes also have the functionality to provide various interactive services. The software which allows for interactive services is called middleware. The continuing evolution of middleware products and related services may lead to different middleware being used by different broadcasters, and further potential incompatibilities between the set top boxes available to viewers. Nevertheless, it is possible that a “universal” set top box or integrated digital television receiver may be available in the future, or at least that all boxes have certain minimum standards regarding reception. Product labelling to identify compliance with a minimum set of standards may be desirable to assist consumer purchasing decisions.

147 Other technological developments may include greater use of in-built recording capability, and other consumer features such as the ability to record one programme while watching another. A particularly notable innovation is the personal video recorder (PVR), which allows the viewer to automatically exclude advertisements from recorded programmes. It is unclear what effect developments such as these may have on future advertising revenues for the free to air broadcasters. The future availability of improved receiving technology is also difficult to predict, as both technological and commercial factors are involved. It is

reasonable to assume, however, that future development is likely to improve, rather than restrict, the features and choice available to consumers.

148 The Ministerial Inquiry into Telecommunications recommended that the conditional access system used by Sky be “specified”. Specification of a service would allow the Telecommunications Commissioner to define terms and conditions of access to the service. The Government has since decided not to adopt the Inquiry’s recommendation. The Telecommunications Bill, currently before Parliament, does not include controls on, or regulation of, conditional access systems.

149 Nearly all set top boxes are suitable for free to air transmissions that are not encrypted, but present hardware and software designs may limit some set top boxes to particular pay tv services. Commercial issues need to be resolved before a single set top box is able to access different pay tv services. The cost of the set top box would need to be separated from the overall cost of service provision, and sharing arrangements would need to be reached between operators. Some existing set top boxes may not be technically capable of using two different conditional access systems, however.

150 It is unclear if industry players will agree on a common middleware package for all set top boxes, which would allow viewers and customers to access interactive services provided by different operators. Broadcasters have an incentive to do so as this would maximise their ability to reach viewers and customers. Conversely, a platform provider may seek to control access capabilities of the set top box for commercial reasons (i.e. to minimise viewer leakage to other services).

151 In addition, public service broadcasters such as Television New Zealand may not in the future provide all their services on a free to air basis. For example, certain on demand and internet services may be on a user pays basis in order to generate new income streams and be self-supporting.

152 The extent to which mandatory set top box standards may be necessary will also be influenced by the transmission technologies adopted. Clearly, a significant roll out of a terrestrial UHF network would provide greater opportunity to access digital services. This would minimise the potential for satellite services or the Sky set top box to become a “choke point” limiting consumer access to digital services.

Does ensuring public choice and access to a full range of digital television content and services warrant specific government policy interventions, e.g. mandated standards for open access and set top boxes?

4.1 If so, what aspects should such requirements cover (potentially terrestrial, satellite, and cable transmissions, free to air, pay tv, conditional access and middleware)?

4.2 Should industry develop agreed performance requirements and standards for set top boxes, for example through Standards New Zealand?

4.3 Should product labelling and consumer information be implemented in regard to digital television receiving equipment?

Issue 5: Geographical Coverage

153 The financial cost associated with the roll out and maintenance of a terrestrial digital platform means that the provision of terrestrial services to all areas of New Zealand is unlikely to be economically attractive. NZ on Air presently funds the maintenance of 148 Television New Zealand installations in remote areas, and also funds coverage extension of TV3 to some smaller areas. Current estimates suggest that, without specific policy intervention, an economically viable terrestrial digital network may eventually cover approximately 75% of the population. The costs of providing coverage beyond this level increase exponentially. This means that a number of rural and provincial areas may not have access to terrestrial digital television services.

154 The delivery of digital television services via satellite to rural and provincial areas is both economically viable and practical, however. Satellite services are provided through the lease of a satellite transponder, which is generally cheaper and less capital intensive than rolling out and maintaining a comparable network on the ground. However, satellite cannot readily provide some of the commercially attractive services possible through a terrestrial network, such as localised advertising.

155 In general, the transition from analogue to digital television services can be seen to raise the following key issues for rural and provincial areas:

- how will rural and provincial areas be able to access digital television services?
- what services should be available to such areas, and should they extend beyond free to air television to include information, educational and other services not likely to be viable on a commercial basis?
- what cost will viewers in these areas face in accessing digital television services?
- over what timeframe should digital television services be introduced for rural and provincial areas?

Access to Services

156 The ability of rural and provincial areas to access digital television services is likely to depend on the use of a satellite platform. Unlike the main urban areas, rural and provincial areas are unlikely to have a choice of cable or terrestrial digital services.

157 As noted previously, there is only one satellite with a suitable footprint over New Zealand. There is currently no reason to believe that access to this satellite will not be available in the future. If it is not, however, digital services for rural and provincial areas may be compromised.

158 Assuming satellite digital services continue to be available to rural and provincial areas, it can be expected that these areas will have access to the full range of pay tv digital television services that are provided in the main urban areas of New Zealand, as is currently the case. It is not clear, however, whether rural and provincial areas will have access to other non-commercial services and free to air services that are currently available on analogue television. This would require all such services to be broadcast via satellite without encryption.

159 The Television New Zealand-Sky arrangement for the broadcast of TV One and TV2 demonstrates that commercial arrangements for the broadcast of free to air digital television services are possible, and can result in mutually beneficial outcomes for both parties. Future interactive services are possible under the arrangement, but these would need to use the same middleware and functionality used by Sky for its interactive services.

160 If significant viewer uptake of satellite reception on a free to air basis occurs, the present role of NZ on Air in subsidising remote area analogue transmission costs would need to be reviewed. Arguably, funding might be re-targeted towards broadening the range of content available on free to air satellite services.

Cost of Access to Services

161 Those in rural and provincial areas wishing to access solely unencrypted satellite digital television will need to purchase a set top box and a satellite receiving antenna (dish). Free to air services would then be viewed free of charge.² Any pay tv services that viewers choose to subscribe to would incur an ongoing cost, as is currently the case.

162 The cost incurred by rural and provincial areas in accessing and viewing satellite digital television services will be the same as the cost faced by viewers in the main urban areas. The only cost difference that might arise would be if urban areas had a choice of terrestrial digital services or satellite services. In this case, urban areas may incur a reduced cost by choosing terrestrial over satellite services, as this may not require the purchase of a satellite antenna. The cost would also be reduced if set top boxes for terrestrial television were cheaper than those for satellite television, although it is not clear that this would be the case. The timing and nature of the transfer from analogue to digital television, and the development of new technology in overseas markets, are both likely to influence these costs.

Timeframe for Introducing Digital Services in Rural Areas

163 The present rural television translator network is ageing, and it would not be economically attractive to replace it with either analogue or terrestrial digital facilities. Building, maintenance and replacement of this network is a commercial decision for the provider of a large part of this network, BCL, and the broadcasters themselves. If the network does fail through lack of ongoing investment, rural and provincial areas may not have access to television services through any means other than satellite.

164 Equally, the introduction of digital television services broadcast via satellite means that rural and provincial areas that have not previously been able to receive any television signal are able to do so. These two factors raise a question as to whether there would be benefits associated with simulcasting analogue and digital services in these areas as soon as possible.

165 In general, it seems that the transfer to satellite digital television services is happening in rural and provincial areas at a reasonable speed by itself. These areas can already access Sky pay tv services and TV One and TV2 free to air services. The broadcast of other free to air services is currently a matter under commercial negotiation.

² As noted above, TV One, TV2, TV3, TV4 and Prime are currently available in digital format, but without additional pay tv programming, on a low-cost Sky subscription of \$17/month.

Geographical Coverage

- 5.1 *Should the Government take steps to ensure that rural and provincial areas are guaranteed access to certain digital services in the future? If so, what services are necessary and what steps should be considered?*
- 5.2 *Should the Government take steps to facilitate arrangements for the broadcast of all free to air services on the satellite platform? What approach should be taken for other non-commercial broadcast services and services which are only economic on a terrestrial platform?*
- 5.3 *Are rural and provincial areas likely to face greater costs than urban areas in the transition from analogue to digital?*
- 5.4 *Are there any considerations that suggest that the transition to digital television services in rural and provincial areas should follow a different timeframe to that for the rest of the country?*
- 5.6 *Are there any other issues facing rural and provincial areas in the transition to digital television that should be taken into account in the policy development process?*

Issue 6: Implications for Public Broadcasting

Programme Funding

166 Currently, funding for public interest broadcasting is made available on a contestable basis through NZ On Air. Under the Broadcasting Act, when examining a proposal for the funding of a television programme, NZ On Air must take into account the potential size of the audience likely to benefit from the programme. In practice, this means that NZ On Air funding has been used mainly, if not exclusively, for programmes that have an undertaking to be broadcast by a nationwide broadcaster (TV One, TV2 or TV3). The restructuring of Television New Zealand as a Crown company, and the adoption of a charter, will give additional mechanisms for promoting public interest programming.

167 While Television New Zealand and CanWest both currently maintain a nationwide analogue terrestrial television network, it may not be economically viable to maintain these networks in the future. This may have implications for the funding of public interest broadcasting, and consequently on whether all sectors of both urban and rural communities are able to receive public interest programming from a free to air broadcaster, through any of the various transmission methods.

168 Should broadcasters arrange free to air carriage on a digital satellite service, then potentially anyone in New Zealand regardless of location will be able to view free to air programming, provided they have the correct reception equipment. This could serve to increase the number of broadcasters that meet NZ On Air's coverage requirements for funding public interest broadcasting for free to air viewing.

Audience Fragmentation

169 Digital technology allows many more television channels to be broadcast on a given bandwidth than analogue technology. Overseas experience suggests that as consumers begin to convert from analogue to digital services, they are faced with an increasing array of viewing choices. This tends to result in audience fragmentation and a smaller viewing audience for each channel. This in turn has implications both for public interest broadcasting and for commercial broadcasters reliant on advertising revenue.

170 Audience fragmentation may make it more difficult for public interest programming to reach its intended audience. Conversely, the wider variety of channels that are anticipated in the digital broadcasting environment could make it easier for broadcasters to target special interest programmes at the appropriate audience segment.

171 Advertising revenue is tied to viewing numbers. A proliferation of channels may reduce the number of viewers watching any given programme and hence the price companies are prepared to pay to place their advertisements. An increasingly fragmented television market also may tend to spread advertising revenue over a greater number of channels and/or broadcasters. This has the potential to affect the financial viability of both commercial and non-commercial broadcasters.

Non-Commercial Television

172 A number of licences have been granted at no resource cost to facilitate the broadcasting of programmes which may not attract a commercially viable audience. On one hand, the increased capacity available with the introduction of digital broadcasting could enhance the ability of these non-commercial broadcasters to reach a carriage arrangement with a commercial broadcaster. On the other hand, the increased audience fragmentation that is expected in a digital environment could make this more difficult.

Māori Television

173 UHF spectrum was reserved in the early 1990's for the purpose of promoting Māori language and culture. There is sufficient reserved spectrum for both terrestrial analogue and terrestrial digital signals, covering approximately 80% of the population, if the future Māori television service chooses to undertake such a course.

174 If a greater level of coverage is desired, a practical alternative could be digital satellite transmission. Digital satellite transmission would give 100% coverage without the cost of building and maintaining a terrestrial network. The success of satellite broadcasting would depend on sufficient capacity being available on the Optus B1 satellite (or any other satellite available in the future) and potential viewers purchasing the necessary reception equipment or being able to use existing Sky set top boxes.

Retransmission Rights

175 The Ministry is currently consulting on possible changes to the Copyright Act. At present, cable operators have the right to re-broadcast free to air programmes in certain circumstances (free to air broadcasters may impose a licensing arrangement but cannot prevent a cable operator re-broadcasting their programmes). Satellite services are specifically excluded from this provision.

176 Arguably, the right currently enjoyed by cable operators should simply be removed on the grounds that it is no longer needed. If the right were to be extended to include satellite transmission, however, one option would be to require any such re-broadcasting to be on a free to air basis.

What are the implications of digital television for public broadcasting services and local and special interest content?

List of Questions

In what circumstances, if any, is Government intervention in the choice of technology used to implement digital television justified?

- 1.1 *Does the Government have a role to play in promoting or preventing one or more of the identified technologies used to transmit or receive digital television?*
- 1.2 *If so, what objectives should the Government be seeking to achieve and what interventions should it consider to achieve those objectives?*

Should suitable spectrum for terrestrial use be allocated in due course, and if so, on what basis?

Spectrum for Satellite Television

- 2.1 *Is the existing administrative licensing regime which applies to spectrum for satellite transmissions appropriate? If so:*
- i *Should any resource charge be considered to give greater equity vis-a-vis terrestrial broadcasters?*
- ii *How should the Ministry determine whether to provide terrestrial licences or to preserve and license the spectrum for satellite services?*
- 2.2 *If administrative licensing is not appropriate, what is a preferable alternative?*

Spectrum for Digital Terrestrial Television

- 2.3 *What spectrum should the Government make available for terrestrial digital television services?*
- 2.4 *Should the Government allocate spectrum in the form of management rights, spectrum licences, or a combination of both?*
- 2.5 *Are the allocation options put forward in 1998 still valid?*
- 2.6 *What allocation of 12 GHz spectrum should be made?*

Spectrum for Simulcasting

- 2.7 *Should any special provision be made for existing broadcasters to manage the transition to digital television?*
- 2.8 *If so, should any such provision incorporate a requirement to implement particular transmissions in, and for, specified timeframes?*
- 2.9 *If so, are either of the options discussed above suitable, or are there further preferable alternatives?*

Competition Issues

- 2.10 *Is anti-competitive behaviour likely in respect of digital television services?*
- 2.11 *Are there any particular characteristics of spectrum suitable for digital television, or of broadcasting markets, which justify acquisition limits for spectrum over and above the Commerce Act safeguards?*
- 2.12 *If so, what are these factors and what form and level of limits are appropriate?*

Should analogue services should be "switched off" at a certain date, and if so, what policies should apply?

- 3.1 *Should a policy of mandatory termination be established, and if so, at what time should the Government consider establishing the actual termination date, and what criteria should be used in determining the date? Or*
- 3.2 *Should the termination issue should be left for industry to manage in light of their costs and viewer take up? Or*
- 3.3 *Should the termination issue be left open, to be reviewed at a future date, and if so when should such a review be undertaken?*

Does ensuring public choice and access to a full range of digital television content and services warrant specific Government policy interventions, e.g. mandated standards for open access and set top boxes?

- 4.1 *If so, what aspects should such requirements cover (potentially terrestrial, satellite, and cable transmissions, free to air, pay tv, conditional access and middleware)?*
- 4.2 *Should industry develop agreed performance requirements and standards for set top boxes, for example through Standards New Zealand?*
- 4.3 *Should product labelling and consumer information be implemented in regard to digital television receiving equipment?*

Geographical Coverage

- 5.1 *Should the Government take steps to ensure that rural and provincial areas are guaranteed access to certain digital services in the future? If so, what services are necessary and what steps should be considered?*
- 5.2 *Should the Government take steps to facilitate arrangements for the broadcast of all free to air services on the satellite platform? What approach should be taken for other non-commercial broadcast services and services which are only economic on a terrestrial platform?*

- 5.3 *Are rural and provincial areas likely to face greater costs than urban areas in the transition from analogue to digital?*
- 5.4 *Are there any considerations that suggest that the transition to digital television services in rural and provincial areas should follow a different timeframe to that for the rest of the country?*
- 5.6 *Are there any other issues facing rural and provincial areas in the transition to digital television that should be taken into account in the policy development process?*

What are the implications of digital television for public broadcasting services and local and special interest content?

- 6.1 *Does the Government have a role in ensuring that all New Zealanders have access to digitally broadcast public interest programming? How can/should this be achieved?*
- 6.2 *What issues are seen in the broadcasting of public interest programming in a digital environment?*
- 6.3 *Should special account be taken of the availability of channels which currently carry public interest broadcasting, i.e. TV One, TV 2, TV3 and non-commercial regional stations?*
- 6.4 *In what ways will audience fragmentation positively or negatively impact on public interest programming?*
- 6.5 *How will the audience fragmentation likely in a digital environment affect broadcasters financially?*
- 6.6 *How will the introduction of digital television broadcasting impact on non-commercial broadcasters?*
- 6.7 *How will the introduction of a digital television broadcasting environment affect the future Māori television service?*
- 6.8 *Are there issues unique to the introduction of digital broadcasting which will be affected by either expanding section 88 of the Copyright Act to include satellite broadcasters, or conversely, repealing section 88 to remove the ability of cable broadcasters to re-broadcast free to air programmes on their cable network?*

Responses to Discussion Paper

Comment on the above issues should be sent to:

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Resources and Network Branch
Ministry of Economic Development
PO Box 1473
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Attention: Ian Hutchings

Telephone: (04) 474 2940
Fax: (04) 499 0969
Email: ian.hutchings@med.govt.nz

177 Comments should be received by **15 April 2002**.

Official Information Act 1982

178 The content of submissions provided to the Ministry in response to this discussion document may become subject to public release under the Official Information Act 1982. Please advise if you have any objection to the release of any information contained in a submission to this discussion document, and in particular, which part(s) you consider should be withheld, together with the reason(s) for withholding the information. The Ministry will take into account all such objections when responding to requests for information on submissions to this document under the Official Information Act 1982.

Privacy Act 1993

179 The Privacy Act 1993 establishes certain principles with respect to the collection, use, and disclosure of information about individuals by various agencies including the Ministry. It also governs access by individuals to information about themselves held by agencies. Any personal information you supply to the Ministry in the course of making a submission will be used by the Ministry only in conjunction with consideration of matters covered by this document. Please clearly indicate in your submission if you do not wish your name to be included in any summary of submissions that the Ministry may publish.

Experience in other countries

AUSTRALIA

The Australian Government has, comparatively speaking, been active in managing the transition to digital television broadcasting. Existing broadcasters as at 1998 were required to commence digital broadcasting in the five major metropolitan areas on 1 January 2001, and between 1 January 2001 and 1 January 2004 in all other areas. Broadcasters must provide digital coverage equivalent to their analogue coverage, with the same or better reception quality, as soon as practicable.

Where technically possible, the Government has allocated digital terrestrial broadcasting licences to existing terrestrial broadcasters in the same UHF and VHF frequency bands as they currently use for analogue transmissions. The Government has sought to maximise the number of channels available by creating digital channels with a bandwidth of 7 MHz, as for existing analogue broadcasts. This initially led to some difficulties, however, in sourcing suitable set top boxes.

Spectrum has been provided free to charge to existing analogue broadcasters, both commercial and non-commercial, on the condition that they use the spectrum to simulcast their analogue signal in digital. Simulcasting of analogue and digital signals must be maintained for at least eight years, whereupon the situation will be reviewed. During most of the simulcast period, no new broadcasters will be permitted to enter the market. Broadcasters must broadcast in standard definition television at all times, with at least 20 hours/week broadcast in high definition after two years of beginning digital broadcasting.

Further information is available from:

Australian Broadcasting Authority www.aba.gov.au

Australian Communications Authority www.aca.gov.au

Digital Broadcasting Australia www.dba.org.au

CANADA

In Canada existing broadcasters, including community broadcasters, wishing to simulcast existing analogue services qualify for a transitional digital television licence. While the licence is to be used for simulcasting existing analogue broadcasts, up to 14 hours/week of non-simulcast material may also be broadcast in digital format. This is to encourage innovation in digital broadcasting, and is seen as an aid to consumer transition between the two technologies. If broadcasters fail to take up a transitional digital television licence within a 'reasonable' period, the Canadian licensing authority has stated it will be open to applications by new broadcasters.

The Government has not set a date when analogue terrestrial broadcasting will be switched off, suggesting instead that the process of switch off should be market-driven.

The Canadian Government expects that coverage of digital signals will be the same as for existing analogue signals, but that the most enhanced signal possible (i.e. high definition if possible) will be supplied.

Any new material broadcast on transitional digital licences must be broadcast in high definition, and continue to meet the 50% local content requirement to which all broadcasters in Canada are subject. Currently, cable and satellite distribution companies must carry existing free-to-air (terrestrial) programming as a condition of their broadcast licences.

Further information is available from:

Canadian Radio-television and Telecommunications Commission www.crtc.gc.ca

Industry Canada

<http://www.strategis.ic.gc.ca/>

UNITED KINGDOM

Digital terrestrial television was launched in the United Kingdom in 1998, shortly after satellite transmission. Cable transmission is now also available. Licences to broadcast in digital were allocated to all broadcasters. The Government is currently seeking public comment on how much spectrum is required for digital terrestrial broadcasting in the future, in order to ascertain how much spectrum will be freed up for reallocation once simulcasting of analogue services ends.

No formal requirement to simulcast exists, with broadcasters making their own decisions as to when to cease analogue transmissions. In study completed in 1998 on behalf of the UK Government, National Economic Research Associates (NERA) found that switch off of analogue transmissions appeared feasible within a 10 – 15 year time frame. NERA also found that there were likely to be significant benefits to the economy from an early announcement of the closure date for analogue services, as this would facilitate the fall in the price on digital equipment. Current indications are that terminating analogue transmissions will be re-examined between 2006 and 2010. However, the Government has stated that in order to avoid digital divide issues in television broadcasting, terminating analogue transmissions will not be undertaken until the “overwhelming majority” of the public has access to digital transmissions at a reasonable cost.

Currently, digital cable television services pass approximately 80% of British households. 84% of households can potentially access digital transmissions from the five original free to air terrestrial broadcasters. Satellite has the potential to achieve 100% coverage. Recently, however, the Government has suggested that market forces alone may result in inequalities developing between consumers able to afford to transition to digital technology and those who are not. Efforts to increase the take-up of digital television are currently being undertaken.

The public service broadcaster, the BBC, currently broadcasts both its original analogue free-to-air non-commercial channels on a digital terrestrial platform. S4C, which broadcasts Welsh and Gaelic television programmes has also transitioned to digital terrestrial broadcasting. Cable and satellite broadcasters must carry free to air channels on their digital distribution networks.

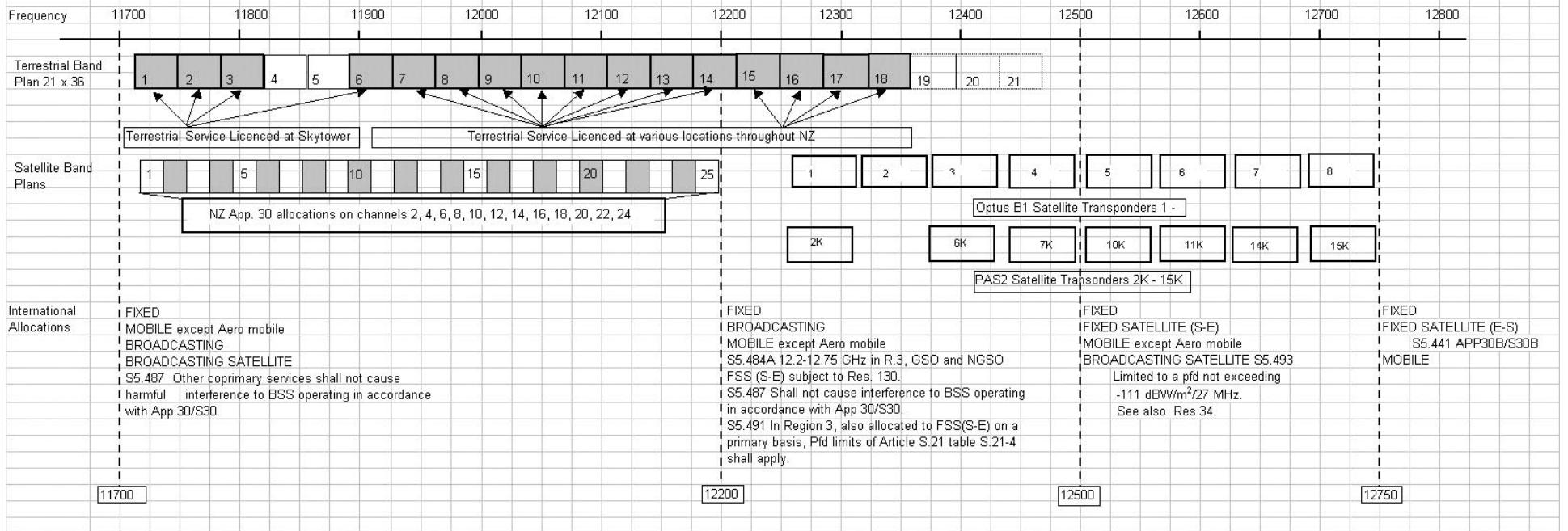
Further information is available from:

Radiocommunications Authority www.radio.gov.uk

Digital Television Group www.dtg.org.uk

Independent Television Commission www.itc.org.uk

Simplified usage and allocations in the 11.7 - 12.75 GHz band.



Glossary

Conditional Access	Software/hardware used to limit unauthorised access to broadcast programmes. Typically used for pay tv services. A choice between some half dozen proprietary products is available.
DDN	Digital Data Network – a digital transmission using satellite formats, but transmitted from terrestrial sites, proposed for operation in the 12 GHz bands.
DTT	Digital Terrestrial Television – digital services transmitted from a network of sites, typically using frequencies in the UHF bands.
DVB	Digital Video Broadcasting – a family of digital transmission standards covering satellite, cable and terrestrial broadcasting.
MHP	Multimedia Home Platform – a non proprietary facility being developed that allows interactive applications within the DVB family of standards.
Open TV	A developed proprietary facility that allows interactive applications on digital services. Used by Sky in New Zealand.
Set Top Box	Receiver/decoder used to convert digital signals to present television formats. Can provide conditional access control and advanced features such as interactive applications.
UHF	Ultra High Frequency – a band of frequencies from 500-800 MHz used for television broadcasting, including Sky terrestrial, Prime, TAB and regional non-commercial broadcasts.
VHF	Very High Frequency – a band of frequencies from 50-230 MHz used for television broadcasting, including TV One, TV2, TV3, and TV4.
12 GHz	Frequencies used for satellite broadcasting and other terrestrial uses.

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