MATSUSHITA ELECTRIC CO. (AUST.) PTY LIMITED
Station Street, Penrith NSW 2750

7 June 1999

Professor Richard Snape
Commissioner
Productivity Commission
Locked Bag 2
Collins Street East Post Office
Melbourne VIC 8003

Dear Sir,

The Digital Television sub-committee of the Australian Electrical and Electronic Manufacturers' Association (AEEMA) welcomes the opportunity to contribute to the public inquiry being conducted by the Productivity Commission into the Broadcasting Services Act and related legislation. As chairman of the sub-committee I will limit my written submission to highlighting matters related to the Television Broadcasting Services (Digital Conversion) Act 1998 ("the Digital Conversion Act") and the development of digital television receivers for the Australian market.

Introduction

I was AEEMA's representative and Chair of the Minister's Working Group responsible for developing the Digital Broadcasting Industry Action Agenda. The Working Group also included representatives from the Australian Information Industries Association, the Internet Industry Association and the Department of Communications Information Technology and the Arts. The Minister for Communications Information Technology and the Arts tabled the Action Agenda in the Parliament in January 1999, fulfilling the requirement of clause 4(1) the Digital Conversion Act.

The Action Agenda envisages the introduction of digital broadcasting creating opportunities for Australian industry to develop and market:

- electronic and computer hardware;
- computer software;
- broadcasting, datacasting and technical services; and
- broadcasting and datacasting content.

There are eleven initiatives arising from the Action Agenda. The first of these is the establishment of "a Digital Broadcasting Industry Coordinating Group to provide direction and oversee the implementation of the Digital Broadcasting Industry Action Agenda".

The Digital Broadcasting Industry Coordinating Group has been formed, with representatives from the following industry associations:

- Australian Consumers Association (ACA)

- Australian Electrical and Electronic Manufacturers' Association (AEEMA)
- Australian Information Industries Association (AIIA)
- Australian Interactive Media Industry Association (AIMIA)
- Australian Subscription Television and Radio Association (ASTRA)
- Consumer Electronics Suppliers' Association (CESA)
- Department of Communications Information Technology and the Arts
- Federation of Australian Commercial Television Services (FACTS)
- Internet Industry Association (IIA)
- The newly formed Digital Convergence Australia has also been invited to be represented on the Coordinating Group.

At the first meeting of the Digital Broadcasting Industry Coordinating Group, I was elected Chair and two sub-groups were formed to address Actions 2 and 3 of the Action Agenda. Action 2 is to "promote the adoption in Australia of an open interface for encryption services", while Action 3 is to "establish a program to educate retailers and consumers concerning the transition to digital broadcasting and the consumer equipment required".

A Manufacturer's Perspective

The Working Group for the Digital Broadcasting Industry Action Agenda commissioned Digital Business Consulting Pty Limited to prepare a report on the opportunities for Australian industry with the introduction of digital broadcasting. The attached excerpt of the report relating to manufacture of interoperable digital television receivers provides an outline of the Australian television market, the expected market demand and the likely range of digital television products.

The Productivity Commission has received submissions from both licensed and aspirant free to air and subscription television services, from Internet service providers and aspirant datacasting service providers. There has been some discussion at the Sydney hearings about the length of the simulcast period and interoperable digital set top boxes.

As a representative of a global manufacturer in Australia, I would like to outline my submission on these two issues. If the Commission wishes I will elaborate further at the Melbourne hearing.

Simulcast Period

- The transition to digital television is an "evolution" rather than a "revolution"

- There are more than 10 million analog television sets in Australia, an average of 1.5 sets per household. The average analog television set is replaced every 8 years at an average price of around $750, with the old television set being used as a second or third set in the home.

- Sales of analog television sets will not cease on 1 January 2001. One supplier believes that by 2005, 75% of all televisions sets sold in Australia

will be analog. With the number of televisions in the average home increasing (as analog televisions are retained as second and third sets), it has been estimated that by 2012 there could be as many as 15 million television receivers in Australia.

- The consumer proposition for digital television is not yet clear.

- After fifty years of development the analog television set is one of the most utilised, reliable and functionally simple electronic products in the home. Digital television receivers, while offering more functionality, will also be far more complex in design than current receivers and will be driven by software.

- As digital television technology matures, prices for receivers and displays will fall and HDTV programs will become less expensive to produce. These processes are certain to extend over a much longer period than the eight years of simulcast. The extent to which they will have progressed by 2009 (the end of simulcasting in metropolitan markets) is difficult to estimate.

- The inability, imposed by law, of commercial free to air services to provide multiple programs on a single channel could significantly alter the consumer proposition and therefore negatively impact on demand for digital receivers for the short to medium term. However the requirement for terrestrial services to provide HDTV programs will enhance demand for high definition receivers and larger displays in the longer term.

- Even though the number and type of services to be delivered will influence demand, initially the price of receivers and displays will be the main factor limiting digital receiver penetration.

- Broadcasters and datacasters will need to have access to spectrum during the simulcast period to develop new services to test consumer demand, without being unnecessarily limited by strict simulcasting requirements, by definitional constraints or by excessive spectrum charges.

- The coverage of digital television services during the simulcast period needs to be as good as, if not better than, current analog television services.

Set Top Boxes

- The major manufacturers are each likely to make a set top box chassis for the global market, to reduce manufacturing costs..

- With digital multi-channel services being delivered via satellite and, possibly via cable, and high definition programs and program enhancements being provided by commercial free to air terrestrial services, there is likely to be demand for a cross platform interoperable

digital receiver in Australia. However this demand is difficult to gauge. Market demand and pricing will be the determining factors.

- The DVB system enables receivers capable of being interoperable across platforms, eliminating the need for multiple set top boxes and allowing the consumer to access a greater choice of services. However digital satellite, digital terrestrial and, possibly, digital cable transmissions will use different modulation systems making interoperable receivers relatively expensive, compared to single platform, single purpose subsidised proprietary set top boxes.

- With the DVB system the receiver may be used for a number of purposes – standard definition and high definition television, stereo sound and surround sound, datacasting and interactivity, free to air (unencrypted) and subscription (encrypted), point to point (pay per view) and point to multi-point (near pay-per-view). However the more receiver capability the consumer demands, the more expensive the receiver becomes.

- The legislated requirement for free to air broadcasters to transmit HDTV programs does increase the cost of digital terrestrial receivers, as additional memory and processing is required to decode these signals. However this is a relatively low cost impost for digital television receivers, as memory and processing costs decreasing.

- The free to air broadcasters have chosen the Dolby AC3 surround sound system to be broadcast with high definition programs. However this is relatively low cost impost for digital television receivers, as combined MPEG/Dolby AC3 chip sets are now being manufactured.

- Aspirant datacasters will require receivers that have some of the characteristics of computers – storage capacity, processing capability, an operating system, technical interfaces, ROM systems, viewer interface, scrambling and encryption interfaces, smart card reader, and keyboard. These elements will, when added to a basic receiver capable of receiving digital television transmissions, represent a significant additional cost, both in manufacturing and to the consumer.

I look forward to discussing these issues at the public hearing in Melbourne on [day date] June 1999.

Yours sincerely

Ross Henderson
Director and General Manager, TV Factory

Attachment: Chapter 4 Global Demand for Interoperable Digital Television Receiver Units

Chapter
4

Global Demand for Interoperable Digital Television Receiver Units
- Opportunities & Challenges for Australian Industry

Opportunity

Eventually every analog television receiver will be replaced or supplemented by a digital television system. Relative to most other nations, Australia is an early starter in this new technology. Australian industries will have the potential to develop products for the domestic consumer market that have the potential for global marketing.

It is expected that for a large part of the digital television product range, the receiver and display systems will be modular rather than integrated.

This modular concept has advantages for Australia.

Australia has an opportunity to design, develop, manufacture and deliver modules of this system to the following two digital television receiver markets:

1. to the mass digital television market with a low cost interoperable digital receiver and converter unit

2. to a global niche market with a high value interoperable high definition receiver unit that includes high end management systems and software applications.

The opportunities for development of the software applications to be included in the high definition receiver unit are set out in Part 7 of this report. Part 4 explores the design and manufacture opportunities for the receiver unit.

Core Competencies

- Australia has expertise in design and development of niche and innovative products for broadcasting stations (eg race-cam)

- Australia has proven expertise in development of computer software for internet and interactive services.

- Australia will be one of the first countries in the world with five television networks broadcasting in digital high definition from 2001.

- Australia has a small, but vital, contract manufacturing industry with the ability to deliver relatively small production runs within a reasonable time.

Current Size of Australian Market

In Australia alone there are over 10 million analog television receivers and over 6 million analog VCRs. It has been estimated that the value of the Australian market with the move to digital will be $19 billion ($11 billion more than the normal market value).[1] This figure seems reasonable considering the estimated cost to consumers of purchasing digital reception and ancillary equipment over the simulcast period from 2001 to 2012. Ancillary equipment would include digital VCRs, DVDs, ROMs & RAMs, digital video cards, Pay-TV systems, digital home theatre systems.

In terms of analog televisions, the Australian market is relatively small in terms of global production.

Television and Related Equipment Penetration in Australian Households

Number of Australian homes	6.8 million
Analog Colour Television Receivers	10.0 million
Analog Video Cassette Recorders	6.0 million
Digital Video & Laser Disc Players	0.1 million
Digital Satellite Pay-TV Set Top Boxes	0.2 million
Analog Cable & MDS Pay-TV Set Top Boxes	0.4 million

The next table sets out the sales of analog PAL 4x3 television receivers in Australia for the year ended 31 December 1997. It should be noted that the sales of analog wide screen have been at a slow rate of one or two thousand per annum. PAL analog does not support correct format for wide screen. The PAL pictures are distorted in wide screen mode. This will not be the case for digital transmissions.

Annual Sales of Television Receivers in 12 months to December 1997

Television Receivers		
Screen Size (cm)	Numbers sold[2]	% of Total
28 and smaller	220,620	25%
38-48	133,487	15%
49-52	199,534	23%
53-61	81,506	9%
62-75	218,232	25%
76 and larger	22,588	3%
Total Television Receivers	875,967	100%

As one of the features of digital terrestrial television is the capacity to provide interactivity and Internet access, it is relevant to set out the penetration of computers with Internet access into the home.

[1] PricewaterhouseCoopers Digital Broadcasting in Australia August 1998
[2] Matsushita Electric Co. (Aust) Pty Limited

Computer Penetration in Australian Households in 1998[3]

Number of Australian homes	6.8 million
Homes with a Computer	2.9 million
Homes intending to purchase a computer in next 12 months	0.4 million
% of homes with or intending to have computer	48.5%
Homes with Internet access	0.9 million
Homes intending to obtain Internet access in next 12 months	0.5 million
% of homes with, or intending to obtain access to, Internet at home	20.5%

Expectation of Market Demand for Digital Television Receivers

Officials of the consumer electronics industry, representing set manufactures, are quick to remind skeptics that color TVs as well as many other "hot" consumer electronics products including VCRs, took at least a year to reach the one million mark in unit sales. Gary Shapiro, president of the US Consumer Electronics Manufacturers Association (CEMA) has said he believes that only "a few thousand" HDTV sets would be sold in first year. The president of Sony Consumer Audio/Video, John Briesch, has said DTV won't be an overnight success for a variety of reasons. Among these are:
1) the amount of cross-industry cooperation needed to get HDTV broadcast services and electronics products to market on a relatively simultaneous schedule;
2) the costs of providing/acquiring HDTV programming; and
3) consumer issues including increased awareness of HDTV through a direct viewing experience, set costs, and installation of outdoor antennas to receive DTV broadcasts [a consequence of ATSC not applicable to DVB].

HDTVs - It's Where the Buyers Are - Consumer Interest, Set Availability, Set-Top Converters
Marcia L. De Sonne Director, Technology Assessment NAB Research & Planning

Australia is currently the only country in the world that has chosen the DVB modulation system and has mandated that HDTV be broadcast for a proportion of transmission time (yet to be defined). This is not only an expensive means of production and for transport through broadcasters' studios but also expensive for the consumer. To fully enjoy the benefits of HDTV, the consumer will need to purchase a large screen and a surround sound system.

Australia may also be the only DVB country in the world where the television networks have recommended that the preferred surround sound system for HDTV be Dolby AC3. Dolby is a proprietary system and has been chosen in preference to the open MPEG-2 system that was developed for DVD and DVB. The DVB Group does not support proprietary systems. Therefore developments that include any proprietary systems, such as Dolby AC3, will require development support unique to Australia. The Chairman RC5 of Standards Australia is evaluating if there are any constraints for broadcasting in Australia if either MPEG or Dolby AC3 is chosen.

[3] Household Use of Technology ABS February 1998

Many argue that multi-programming on a single channel is the most compelling application digital television can offer. As Australian commercial broadcasters are precluded from offering such a service, industry experts expect sales of digital receivers will be slow. In fact, one major supplier[4] is expecting that even by 2005 over 75% of all television receiver sales will still be analog.

To meet the different market demands generated by a conversion to digital television with a mandated high definition transmission, the consumer equipment suppliers will need to look at a range of products to offer the market.

Expected Global Digital Television Product Range

In the global market for digital television receivers, the range of products will be priced according to functionality and target market segment.

The challenge for equipment suppliers and retailers in the global television market will be to move from analog to digital without undue revenue variations.

The suppliers cannot afford to see total sales of receivers (analog and digital) fall due to the consumer taking a "wait and see" approach.

A reasonably priced digital receiver unit that converts the digital signal to be viewed on an analog television set would provide an interim solution for the during the transition. This is especially the case for the consumer who has recently committed to analog products.

With the introduction of digital television, the concept of an integrated television receiver with a large screen will eventually disappear. Just as with hi fi and computer equipment, the television will be come modular – with the large screen and the receiver unit being purchased separately from other ancillary equipment such as surround sound amplifiers and speakers.

With the expected modular approach to digital television products for the home, the consumer will be able to up-grade his/her television entertainment system as the budget permits and not be forced to make a large one-off commitment to digital television.

The digital television receiver may also be placed in a more convenient place than in the centre of the lounge room. It could be in a corner, on the wall, in the roof or even on an outside wall. Television screens will also become more "room efficient" with the introduction of new screen devices, for example, the flat plasma screen.

Annexure B of this report is a diagram that sets out the basic elements and options of a Digital Television Receiver.

[4] Matsushita Electric Co (Aust) Pty Limited

There are potentially four markets for a digital terrestrial television receiver units with different price and functionality:

Price Level	Broadcast Inputs	Digital Receiver Unit	Typical Screen & Speaker Outputs
Low	HD SD 16x9 picture Surround Sound	Converts to PAL Converts to Analog Converts to 4x3 Decodes to Stereo	PAL 4x3 Mono or stereo
Low Mid-Range	HD SD 16x9 picture Surround Sound	Scales down to SD √ √ Decodes to Stereo	Small to medium digital 50Hz 16x9 wide screen Mono or stereo
High Mid-Range	HD SD PAL 16x9 picture Surround Sound	Scales down to ED Scales up to ED Converts to digital √ Decodes all sound options	Large digital 100Hz 16x9 wide screen Stereo, 4 or 6 track
High	HD SD PAL 16x9 picture Surround Sound	√ Scales up to HD Converts to digital √ Decodes all sound options	Home theatre 16x9 6 or 8 track

HD – High Definition; SD – Standard Definition; ED – SD line doubling

Low Price / Interoperable / Convert Digital to Analog

This is the simple set top box for receiving digital terrestrial signals and it could be used for digital pay television services. Price would be the driving factor to ensure maximum take up of the multi-channel pay television services. There would be capacity for datacasting but this set would be unlikely to enable interactivity.

If Australian terrestrial broadcasters chose Dolby AC3 surround sound without also transmitting simple MPEG-1 audio, then there additional cost to each receiver for the system to manage and process Dolby AC3 sound. This additional cost may limit sales of receivers. Standards Australia is considering this issue.

As PAL analog televisions are phased out of the market, consumers in this market segment will move up to a higher market segment. All digital receiver units will be able to convert HD and SD signal for analog screens and be able to convert a 16x9 or 14x9 picture to 4x3.

Low Mid-Range Price / Interoperable / Stereo
– Down Scalable Standard Definition Digital Receiver Unit

This receiver unit will eventually replace the converter set top box as the largest market segment for digital receivers. This receiver unit may also have an integrated digital screen (up to 60cm).

As this end of the market is very price sensitive, the functionality of the low mid-range priced digital receiver unit would be limited to those applications with a low marginal cost. Datacasting capability would be limited and the receiver is likely to have only low-level interactive capability.

It is expected this lower priced minimum functionality product will continue to serve the smaller screen, second and third set market and portables as well as the consumers who are connected to interoperable multi-channel digital Pay-TV.

High Mid-Range Price / Multi-functional / 4 Speaker
- Down scalable Standard Definition receiver unit

The high mid-range priced receiver unit has added features that increase functionality. These options could include data storage, modem, keyboard, smart card reader, DVD player etc. This receiver will enable 4 channel sound and provide standard definition images.

This receiver is likely to be used with the larger 16x9 digital screens – 60cm to 90cm – that would not be large enough to get the full benefit of HDTV.

As this receiver is down scalable it enables the purchasers of large analog 16x9 screens to receive digital wide screen signals.

The success of this receiver unit will depend on the price and the demand for particular functionality. As this receiver unit will not be capable of displaying HDTV images, it is difficult to assess the consumer demand for ancillary services that have not yet been developed.

This market segment will grow with the development of standard definition products that focus on particular applications or environments

High Price / Multi-Functional / HDTV / Surround Sound
- Home Theatre Market

This receiver unit will have the capability to process and display a high definition signal and provide up to 7 channels of audio – optimising the benefits of Dolby AC3 or MPEG-2. The cost of this receiver unit will fall as the cost of processing power falls. As the HDTV receiver requires six times the processing power of the mid-price range digital receiver unit, it will remain relatively expensive compared to the standard definition receiver.

Although compared to the cost of a large plasma flat screen and a surround sound system, the high definition receiver unit will be the least expensive component of the “home theatre” experience.

The suppliers argued that there was a need for different classifications of HDTV for transmission and for display. The suppliers argued that there was no screen capable of 1920 horizontal pixels by 1080 lines, which is likely to be the HDTV transmission standard. The issue would need to be raised with Standards Australia.

Nevertheless the HDTV receiver unit will remain in a niche (but lucrative) market for suppliers and software developers. It is a receiver unit that could be developed for Australia’s HDTV environment and be exported to other countries that may introduce HDTV at a later date. The up-conversion characteristics of the Australian receiver make it the ideal unit to convert standard definition broadcasts to a near HDTV experience.

Expectation of Australian Demand for Digital Television Receivers

With the present policy settings excluding commercial multi program streaming, equipment suppliers expect it may be up to five years before the market shifts from being supply-side driven by manufacturers to being demand driven by the consumer.

To enjoy the benefits of HDTV screens will need to be at least 90cm diagonal. Of the 875,967 analog 4:3 receivers sold in Australia in 1997, 72% had screen sizes of less than 61cm. There is little perceivable difference in the picture quality of a digital receiver with a screen size of less than 61cm, when compared to an equivalent sized analog receiver with good reception. With a standard digital display the difference would be even less discernible for many viewers. Digital screens will be 16x9 but it is difficult to determine consumer acceptance of this change. In overseas markets, wide screen has special appeal for viewers of movies and sports features.

Therefore for Australia, where only the national broadcasters will be allowed to provide multi-programming, the suppliers believe that initially the main market drivers for the sale of digital receivers will be interoperable multi-channel digital pay television, some datacasting and improved free to air reception (about 60% of sales). The addition benefits or larger wide screen and interactivity will be the drivers for the remaining market (<40% of sales). HDTV will be a smaller niche market (<5% of sales). A new market will develop with the mobile and portable potential of DVB-T.

Broadcasters are more confident about the consumer acceptability of HDTV than the suppliers.

Estimates of global digital television receiver penetration rates vary widely. In Europe, USA and Japan, where digital commences earlier and with more flexible regimes than Australia, the suppliers are only expecting 25% of the 60 million homes to have digital receivers by 2005[5]. However demand will rise sharply from 2006 as prices of receivers fall and as compelling applications rise.

Phillips Business Information[6] of the UK, has predicted 153 million digital decoders and digital television receivers in North American and European homes by 2005, rising from 39 million in 2000. Phillips submits that where satellite pay-TV penetration is already high and cable penetration is low, the rate of growth will be high. However Phillips estimates that Australia will have 4 million digital receivers in homes by 2005. That is 57% of the Australian homes or 40% of the current number of sets.

Using the suppliers' estimates for Europe, USA and Japan as a basis for Australia and the writers have predicted 25% home penetration of digital receivers by 2005, with a presumption of interoperability across delivery platforms. The writers have then applied the expected proportionate share across the product range to estimate the level of demand for receivers. The demand for the most popular product in the

[5] Estimations of market penetrations for Japan Europe and USA provided by Matsushita Electric Company (Aust) Pty Limited

[6] Digital television Broadcasting – a report by Phillips Business Information www.phillips.com

range, the low priced digital to analog converter, is being generated mainly by digital multi-channel Pay-TV being delivered by satellite.

Estimated Digital Interoperable Television Receivers Penetration by 2005

Price	Digital TV	Penetration	Homes
Low D-A Converter	60%	15%	1,050,000
Low Mid Range SD	12%	3%	210,000
High Mid Range SD	24%	6%	420,000
High HD	4%	1%	70,000
Total Digital	100%	25%	1,750,000
Total Analog		75%	5,250,000
Homes		100%	7,000,000

The size of the mobile and cordless market is a difficult market to estimate at this time. However the market for smaller digital receivers, which can be moved inside and outside the house, may be lucrative in DVB countries. The market growth experience may be similar as to that which occurred with portable radio. It is feasible a popular starting point for digital receivers will be the digital VCR with terrestrial tuner.

Challenge: Pay-TV Operators acceptance of interoperability

Who benefits from the interoperable digital television receiver?

An interoperable digital television receiver provides benefits for the manufacturer, broadcasters, content developers and the consumer**.**

In response to the market demand for interoperability, the target for international standards for digital broadcasting services has been achieved for satellite and cable (both DVB systems) but was interrupted by the US broadcasting regulator's objectives for terrestrial broadcasting with the introduction of the non-compatible ATSC standards for North America.

With the introduction of digital satellite Pay-TV In the United States and Europe, there are already concerted moves, in the interests of efficiencies of consumers, to establish open systems for television services that also include the potential to have encryption schemes available to the consumer market. The introduction of free to air digital television offers a very wide diversity of consumers' service options. It makes sense that the products should be utilised in the most economical way. This will only be possible with standards that ensure interoperability.

The following table sets out the benefits of interoperability that were raised during the consultation process.

Group	Benefits
Manufacturer	❑ Minimises consumer resistance caused by multiple systems ❑ Eliminates the manufacturing duplication of set top boxes ❑ Increases economies of scale with larger production runs ❑ Opportunity for Australian manufacture ❑ Potential for international markets
Pay-TV Broadcasters	❑ Reduces the cost of delivery of Pay-TV services by not financing the set top box ❑ No longer need to manage churn of Pay-TV set top boxes ❑ Expands market for services with greater consumer acceptance
FTA Broadcasters	❑ Increases the penetration of digital receivers ❑ Removes the perceived “free” Pay-TV set top box from the market ❑ Consumer receives TV directly from FTA broadcaster rather than through a proprietary set top box ❑ New mobile and cordless market
Content Developers	❑ Expands the market for purchasers of enhanced television content ❑ Allows sale of subscription services directly to consumer rather than through the owner of the proprietary set top box
Consumers	❑ Reduces the level of consumer confusion caused by multiple systems ❑ Consumer controls the set top box ❑ Allows more freedom of choice to deal directly with a number of service and content providers ❑ Lowers the cost Pay-TV services

Open scheme for encryption management

The most significant challenge to the acceptance of an interoperable digital receiver unit is to introduce an open scheme for encryption management.

Overseas manufacturers provide three different set top boxes to Australian Pay-TV operators, who in turn rent them to subscribers. None of the boxes are interoperable due, in the main, to proprietary encryption schemes. Each of the boxes is independently installed.

As the set top box will only accept the programming provided by one Pay-TV operator (including the free to air services), that service provider monopolises all television and data services into that home.

The challenge is to have the market accept the idea that each set top box can

use an optional proprietary encryption scheme that satisfies the encryption owner. However this encryption scheme can be added or removed from the receiving equipment by the consumer with his choice of offered services.

This is an open scheme for encryption management.

It is in this area that Australia may have a leading opportunity to establish design, manufacturing and marketing alliances with China, Europe and the United States.

An open scheme for encryption management provides an opportunity for a digital reception equipment manufacturer to provide alternative models that satisfy consumer interests, but still allows any encryption owner to market his encryption scheme in that market. The encryption owner could be a Pay-TV operator, a datacaster or an educational institution.

This in turn provides Australia with an opportunity to be one of the first countries to establish a consumer market for a diverse range of television receiving equipment and a diverse range of service applications.

If we achieve this objective of an open scheme for encryption management then no doubt we would have an opportunity in other countries.

Requirement to offer a rental option

A licence condition imposed on all Pay-TV licensees requires them to offer, as an option, domestic reception equipment (including the set top box and its operating software) on a rental basis.

Currently, Pay-TV operators (on behalf of Pay-TV licensees) enter into contracts with subscribers under which the subscribers can choose to rent the set top box and its operating software. The set top boxes are owned by the Pay-TV operators (rather than the Pay-TV licensees), or a subsidiary company or, in some cases, by the manufacturers themselves who lease the boxes to the Pay-TV operators. The end result is that the Pay-TV licensees have ensured that their subscribers have the option of renting the boxes.

If the set top box was interoperable the Pay-TV operators would be able to outsource the ownership and management of the rented set top boxes to a third party while still offering the rental option to their subscribers.

There would still be a contract between the subscriber and the Pay-TV operator (on behalf of the Pay-TV licensee) under which the subscriber could elect to rent the box. This arrangement does not involve the subcontracting out of the rental obligation. All that is being subcontracted out is the ownership and management of the boxes (and operating software).

Radio Rentals, which recently acquired Rentlo, would be well placed to provide the rental option to Pay-TV subscribers. Radio Rentals has flexible rental agreements with service centres around Australia.

Challenge: Skills required to design digital TV receiver units in Australia

Brendan McManus, Director Business Development Strategic Planning & Marketing for NEC Australia, when asked about the potential for set top box manufacture in Australia said, “If it’s not designed here, forget about manufacturing it here”.

In its submission to the Information Industries Taskforce, January 10th 1997, NEC Australia stated:

> Over the last three to five years, NEC Australia has increased its annual investment in research and development by $20-$30 million. This R&D is made up of investments for local and export products and also for products being developed in Japan for NEC Corporation. NEC Australia has successfully bid for this business through its competitive costs, quality products and adherence to development schedules.
>
> Further expansion of this business is now limited by the availability of suitably trained software engineers throughout Australia. NEC Australia has been forced to recruit suitably trained and experienced engineers from overseas to ensure that contracts are fulfilled.[7]

The Goldsworthy committee addressed this issue broadly in its report - *The Global Information Economy – The Way Ahead* and argued are the limitations on design capability in Australia was due to inadequate funding and support for R&D.

> The recently introduced R&D Start scheme, Cooperative Research Centres (CRCs) and Industry Research and Development Board (IR&DB) grants have been an important support and focus for information and communication technology-related R&D. Nevertheless, given the increasing importance of these technologies across the economy they do not seem to be getting the level of attention and funding they warrant.[8]

In response to those submissions, the Government announced its Industry Policy Statement "Investing for Growth" in December 1997. Alan Evans, Head of Industry Division A of the Department of Industry, Science & Tourism (as it was then) reported:

> Government's support for innovation and research and development is particularly important because it has specific relevance to the electrical and electronics industry. Under the statement, the Government provided a $1 billion package to support business innovation, which included $739 million for R&D over four years. Funding was increased for the R&D START Program which provides grants for basic R&D. This program has been used by the electronics industry.[9]

The issue of availability of the necessary skills in Australia to design digital receiving and transmission equipment and appropriate management systems is a critical one.

If the commercial environment in Australia for an interoperable and scalable TV receiver has been achieved, then the skills to design and develop this equipment could be brought to Australia by one of (or a consortium of) the multinational manufacturers with operations in Australia.

[7] The Global Information Economy The Way Ahead Information Industries Taskforce 1997 p78
[8] The Global Information Economy The Way Ahead Information Industries Taskforce 1997 p85
[9] A Government Industry Partnership – presentation by Alan Evans at the AEEMA National Forum September 1998

Challenge: Manufacturing Digital Television Equipment in Australia

> Australia is an emerging IT player with a strong software base but needs more electronics manufacturing
>
> David Crichton, Director, the Alba Centre, Scotland 1998

Once the terrestrial television receiver has been designed, does Australia have the capacity to manufacture and assemble in Australia?

Most industry participants acknowledged that, as the digital television receiver unit is the means for final delivery of digital broadcasting and datacasting services (satellite, cable and terrestrial), if the receiving equipment is not in homes there will be no demand for the software and ancillary services.

In general Australian electronic manufacturing has come a long way since the days of high tariffs and specific Australian focused standards. Although the level of manufacturing in Australia has fallen, those companies that have employed world's best practices are finding cost efficiencies and growth markets in niche areas of business.

A short history of television manufacture in Australia

1956	Commencement of Television broadcasting in Australia
By 1967	About twelve to fifteen major factories in production of black and white television with virtually no imports due to very high tariffs.
1972-73	Preparation for colour television manufacturing in Australia. About eight manufactures start CTV production. Federal Government, at relatively short notice brings in program to reduce tariffs on electronic products. Overseas and local owners take huge losses as component and audio manufacturing must close at short notice.
By 1995	Only two major multinational companies manufacture or assemble television receivers in Australia – Matsushita (Panasonic) and Sharp. Growth in number of contract manufacturers of electronic components for niche and small production runs for multi-national clients
1998	Only one major non-Asian manufacturer remains in TV production US, Europe & UK remain leaders in chip technology and engineering.

There is a number of successful contract manufacturing concerns in Australia

with major overseas clients. Three examples are:

- Bluegum - clients include IBM and Alcatel
- GPC - clients include Toshiba and Nortel
- AEMS - clients include NEC and Fujitsu

These and other contract manufacturers (such as Entech) provide flexible, responsive, fast proto-typing using current technology. They are diversified, export oriented companies with strong growth prospects. They target small to medium manufacturers as well as multi-nationals.

Contract manufacturing or outsourcing is becoming very common in telecommunications and IT around the globe. KPMG Logistics and Business Operations Group estimates the global market for IT outsourcing revenues will be $78 billion in year 2000 with an average five year annual growth of 17%.[10]

Contract manufacturing could enable the large multinational manufacturing companies such as Panasonic, Sony, Sharp, Sanyo, Philips, LG and Samsung to manufacture an Australian-designed digital television receiver for the global market. Using one or two contract manufacturers, these multinationals would benefit from manufacturing economies of scale to justify local manufacture. Each would have the same basic system but it would be able to be customised with features suited to their particular retail market.

With a favourable exchange rate compared to the US and European markets, more stable economic conditions compared to Asian markets, and the pending tax reductions on Australian industries, manufacturing digital receiving equipment in Australia using contract manufacturers is possible.

Mass or Niche Market

There are design and manufacturing opportunities in Australia in two digital television market segments – the low priced interoperable digital to analog converter and the high end HDTV receiver unit.

If Australia is able to achieve the interoperability goal it will be one of the first countries in the world to find a solution to this consumer/industry issue. Australia will then have the advantage of offering design engineering and specific production services to international companies and markets endeavouring to achieve this objective. The design of the low priced converter could be licensed for manufacture overseas or within Australia.

However with our core competencies of developing high end high engineered products for global markets Australia should look to the interoperable HDTV receiver unit as a lucrative and potentially high profit niche for the global market. It is expected that market penetration of large screen home theatre systems will eventually be about 5%. In Australia, that could represent 350,000 systems. The same proportion of the US, Japanese and European markets would be more than 3 million systems. If HDTV receiver units are priced for export at around $2,000 (without screen and sound system) then the market would be valued at just over $6.5 billion over a 15 year period.

This will then provide a foundation for Australia to become an international player in the development of digital television consumer products, services and applications.

[10] Presentation by Jim Lawrenson at AEEMA National Forum September 1998

Issues for the Action Agenda

- Pay-TV operators agreement on an open encryption system for interoperability. This is an industry issue but Government may be able to facilitate the discussion.

- Availability in Australia of the necessary design skills to design and manufacture a interoperable receiver unit. The opportunity is seen to be there but there is concern that we do not have these skills in Australia. Being a new industry development, the skills may need to be attracted from other software developments, from technical training or research institutions or from overseas.

- Funding for design and export of the receiver unit

- Continuing dialog between the broadcasters, Pay-TV operators, ancillary service providers, manufacturers/suppliers and Government

- Consumer information on digital television receiver. There was concern expressed by the suppliers that retailers need to have information about digital consumer equipment and the transition to digital broadcasting to give a consistent and informed view to consumers.

- On-going Information on the international and domestic markets for digital receivers functionality and sales. The variation in set penetration estimations mean that proper business planning is made far more difficult. Broadcasters and datacasters will also need to know who is buying sets and for what reason so they can tailor products to meet the market.