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Meet the Television of Tomorrow. Don't Expect to Own it Anytime Soon.

Julie Macedo*

I. INTRODUCTION

The digital nation is coming. Everywhere one turns there are advertisements of amazing new products and the startling clarity of a digital picture. Americans love their "TV" and will not be able to resist the transition to digital TV once they have seen it. Yet, there are whispers of discontent. There is grumbling about the lack of programming and the high cost of new television sets. The whispers seem to be coming from several different sources, the same sources that claim the digital revolution will be a miraculous benefit.

A confused consumer may be the downfall of the United States conversion to digital. This Comment will attempt to educate the participants involved in the digital revolution, including consumers. A clear understanding of the goals and intentions of the major digital constituencies is essential in order to realize why the digital transition may continue well into the next century. A better understanding by digital equipment manufacturers and suppliers of digital programming can hopefully lead to an educated and informed consumer.

In this Comment, an explanation of the digital allotment, granted by the government to broadcasters will be followed by a brief discussion of the technology of digital TV. Then, each player, from

* J.D. candidate, UCLA School of Law, 2000. I wish to express heartfelt thanks to my advisor on this article, Kenneth Ziffren. He offered continuous guidance and insight. Thanks are also due to Merrill S. Spiegel and Megan McNulty of DirecTV.

broadcasters to cable, from the government to manufacturers and retailers, to finally the consuming public, is introduced. These introductions include reactions to the digital allotment and expectations about the digital transition. Comments from several key participants are presented, highlighting both the optimism and the frustration about the coming digital age. Finally, some issues that are hovering on the horizon will be acknowledged. By doing so, this Comment will hopefully highlight the factors which may lead to responsible decisions regarding these future issues.

The provisions regarding the 1997 digital allotment are a small portion of the Telecommunications Act of 1996. In that Act, Congress directed the Federal Communications Commission ("FCC") to issue licenses for digital television to incumbent television broadcasters.¹ The digital allotment, effective in April of 1997, grants each current licensee a second six megahertz ("MHz") channel.² In return, broadcasters must provide a free digital video programming service that is at least comparable in resolution to today's analog service and is exhibited during the same time periods as today's analog service.³

The decision to grant the digital spectrum to broadcasters was harshly criticized. Various government officials and consumer advocates called the plan "an unconscionable giveaway"⁴ because other industries have had to spend billions of dollars to buy additional space on the airwaves. Former FCC Chairman Reed Hundt commented that "whether this was the best way to launch digital

¹ *Commission Adopts Rules for Digital Television Service (MM Docket No. 87-268)* (last modified, Apr. 3, 1997 <http://www.fcc.gov/Bureaus/Mass_Media/News_Releases/1997/nrmm7005.html>).

² Other aspects of the FCC's April 3 order include: 1) expedited procedures for giving digital TV licenses; 2) digital licenses are paired with traditional broadcast licenses. If licensee loses one, it will lose both; 3) FCC retained core spectrum plan, but deferred whether core would be channels 2-46 or 7-51; 4) FCC removed freeze on modifications to NTSC stations that took effect on July 25, 1996. *FCC Agrees on DTV Buildout, Not on DTV Obligations and Must-Carry*, COMM. DAILY, 1, 2 (Apr. 4, 1997, Vol. 17, No. 65). Those particular aspects are not addressed in this Comment.

³ *Commission Adopts Rules for Digital Television Service (MM Docket No. 87-268)*, *supra* note 1.

⁴ Joel Brinkley, *F.C.C. Approves 2d Channels for High-Definition Television*, N.Y. TIMES, Apr. 4, 1997, at D2.

television has been legitimately questioned by many.”⁵ Some critics have said the allotment is simply an indication that “broadcasters have had Washington in their hip pocket for decades.”⁶ Regardless of the political relationships leading to the digital spectrum giveaway, it is clear that sending digital transmissions will involve enormous start-up costs. Free use of the spectrum provides an incentive to spend the estimated two to seven million per local station necessary to go digital.⁷

To simply become capable of broadcasting a digital signal, stations must spend millions in equipment costs. The biggest component of cost for most stations is building a new broadcast tower or strengthening an old one.⁸ Tower costs can range from \$500,000 to more than \$3 million.⁹ Transmitters can cost between \$400,000 and \$1 million, and must be accompanied by new antenna and transmission lines, valued at \$300,000 to \$500,000. Add in studio-to-transmitter links, upconverters, routers, satellite downlinks, encoders and high definition tape decks and monitors, and it becomes apparent why broadcasters needed an incentive.¹⁰

⁵ Reed E. Hunt, Adoption of Digital Television Allotment and Service Rules Reports and Orders, April 3, 1997, (Apr. 3, 1997. <<http://www.fcc.gov/Speeches/Hundt/hundtdtv.html>> No longer available on the Internet. Copy on file with Author). Hunt was Chairman of the FCC from 1993-1997.

⁶ Michael Krantz, *A Tube for Tomorrow*, TIME, (Apr. 14, 1997), at 36.

⁷ Glen Dickson, *The High Cost of Pioneering in HDTV*, BROADCASTING & CABLE, Nov. 16, 1998, at S36, S37

⁸ *Id.*

⁹ In some large markets like Chicago, recent estimates still hovered around \$30 million. See Tim Jones, *The Rebirth of TV in Scenes Reminiscent of Another Era*, CHI. TRIB., Nov. 1, 1998, at C1. To avoid signal interference, a market's towers should all be clustered together on a high perch. Chicago's ideal locations, the Sears Tower and the Hancock Center, are already crowded with antennas. Chicago broadcasters are considering building a new, freestanding tower somewhere in the city. See Gary Dretzka, *The Coming Look of Television: A Revolution, But One that's Slow-Moving*, CHI. TRIB., Jan. 12, 1998, at C1. However, a suitable location that could accommodate all thirteen network affiliates and independent stations that is not in the flight path of an airport has been elusive. See *id.*

¹⁰ See Dickson, *supra* note 7, at S36.

The millions necessary for the average local broadcaster to digitally upgrade its studio only covers the cost of exhibiting a digital signal. Producing high definition TV has costs all its own. Bob Turner, vice president of engineering for A.H. Belo station group, a broadcaster, with digital stations currently operating in Dallas, Houston and Seattle, says he would be surprised "if the production part didn't cost \$15 million."¹¹ Such exorbitant costs have many broadcasters taking a wait-and-see attitude. While a conservative attitude may or may not make good business sense, the Clinton Administration is counting on a quick conversion to digital. In fact, the Administration is banking on it.¹²

The government, when granting the digital licenses, hoped that use of the free spectrum would promote a swift transition to digital TV. Therefore, when the conversion to digital was complete, broadcasters would return their analog channel spectrum, which would then be sold.¹³ The billions expected from this spectrum auction are put in jeopardy if there is uncertainty as to when the spectrum will actually become available. The auction is scheduled for 2002, in anticipation of the spectrum being returned for use in 2006.¹⁴ The more untenable the return date becomes, the less the government can expect in bids. For example, consideration by Congress in 1997 of proposals that could delay the return of the spectrum led to the Congressional Budget Office trimming \$2.5 billion off its estimate of auction receipts. This reduced the expected total to approximately \$5 billion.¹⁵ These expected billions are an integral part of both the Administration's and the Congressional balanced budget plan, and were uppermost on the minds

¹¹ See Dickson, *supra* note 7, at S37.

¹² See, e.g., Deborah Shapely, *White House Standing Firm On Deadline for TV Switch*, N.Y. TIMES, July 14, 1997, at D12.

¹³ See Don West, *The Medium They Couldn't Kill*, BROADCASTING & CABLE, Nov. 16, 1998, at S1, S33. Few are willing to speculate as to who will purchase the spectrum, possibly because few believe it will ever be returned. One educated guess is that a digital broadcaster would re-purchase his analog channel and, in time, convert it to a digital channel.

¹⁴ See *FCC Agrees on DTV Buildout, Not on DTV Obligations and Must-Carry*, *supra* note 2, at 3.

¹⁵ See Shapely, *supra* note 12, at D12. The proposals were passed in the summer of 1997; see Part III, *infra*.

of Commissioners at the FCC when formulating digital license requirements.

II. APRIL 3, 1997: THE FCC'S CONTRIBUTION

A. *Market Forces*

National Association of Broadcasters' ("NAB") President Eddie Fritts has declared April 3, 1997 the "birthday of digital television."¹⁶ In its Fifth Rule and Order, the FCC adopted the digital television allotment. The Order was intended to give digital television "a fighting chance,"¹⁷ and was deliberately vague.¹⁸ The FCC saw its role as threefold: "to promote the success of free, over-the-air digital television in a competitive marketplace, to recover the spectrum as quickly as possible, and to ensure that broadcasters serve the public interest."¹⁹ The FCC intended to allow the marketplace and competition to determine many key decisions.²⁰ For example, high definition digital TV (as opposed to standard definition digital TV) is permitted but not mandated of broadcasters. A high definition requirement would have prevented broadcasters from airing multiple channels at once, which may have prevented the creation of services

¹⁶ *FCC Agrees on DTV Buildout, Not on DTV Obligations and Must-Carry*, *supra* note 2, at 2.

¹⁷ Hundt, *supra* note 5.

¹⁸ For example, no new public interest requirements were adopted for the digital channels, and broadcasters were allowed to decide which transmission format would best meet their goals. Blair Levin, FCC's chief of staff during the Hundt administration stated that "the best things we did [concerning digital and HDTV] are the things we didn't do." West, *supra* note 13, at S17.

¹⁹ Hundt, *supra* note 5.

²⁰ Previously, the FCC's Advisory Committee was considering a standard requiring high definition formats, which consumed virtually all of the 6 MHz channel allotment. The FCC felt this would have been a serious constraint on broadcasters' ability to formulate a package of digital programming and services that would be attractive to consumers. "The recommendation of the Advisory Committee . . . ultimately included both high definition and standard definition digital formats." *Id.*; See also *infra* Part IV.

that can compete with what is offered by cable providers or satellite services.²¹

The FCC also rejected the requirement that a broadcaster should broadcast simultaneously on its new digital channel the programming it exhibits on its analog channel.²² The Commission did adopt a reverse simulcast requirement for the last few years of the transition, so consumers who have not purchased digital receivers²³ will not be inconvenienced before the analog signal is turned off.

Another requirement adopted by the FCC states that broadcasters must provide one free television programming service. During and after the creation of digital television, consumers can thus receive what they have come to expect from every current licensee: one free, universally available programming channel.²⁴ This requirement gives broadcasters the freedom to create what they consider the most attractive package of programming and services, hopefully speeding up consumer acceptance of digital television.²⁵

B. *Public Interest Goals*

The public interest goals of the FCC's Order are twofold: public interest programming, and quick recovery of the spectrum, both for later auction and for use by public service agencies. The spectrum's current overcrowding is most harmful to public service agencies that sometimes are unable to send or receive messages in emergencies. The

²¹ A broadcaster's 6 MHz channel is capable of transmitting a single high-definition program, or several standard definition programs. *See West, supra* note 13, at S17; *see also* Hundt, *supra* note 5.

²² This is known as "simulcasting."

²³ This applies to either digital television sets or converter devices.

²⁴ *See* Hundt, *supra* note 5.

²⁵ Hundt called this flexibility "an open invitation to innovation and entrepreneurship." *Id.* The flexibility granted to broadcasters also allows businesses to partner. The implementation of digital television, as discussed above, is costly in both expertise and capital, and by working with others, broadcasters could share facilities, costs, and equipment. This has raised anti-trust concerns, especially regarding cross-industry collaborations. While such collaborations are being considered by broadcasters and the satellite industry, for example, no legal action claiming anti-trust violations has been initiated. *See infra* Part V.C.

spectrum also represents a potential source of revenue from the auction of digital licenses.

The digital allotment of 1997 represents a much swifter recovery than was previously anticipated by prior proposals submitted to the FCC.²⁶ Prior plans expected recovery of 72 MHz after a transition period of fifteen years. The transition approved by the FCC recovers 60 MHz immediately and 78 MHz in ten years.²⁷ The remaining spectrum (36 + 78 MHz) will be auctioned off. The auction is scheduled for 2002, with the return of the spectrum occurring in 2006.²⁸

The executive branch also anticipates that digital television will benefit the public through public interest programming. However, FCC Commissioner James Quello noted that public interest standards

²⁶ One of the original plans called for broadcasters to get a license to a second channel to transmit high-definition signals. The broadcaster would transmit on its analog channel, and send the same programming on its digital channel. After fifteen years of the dual broadcasts, the station would give back its analog license. See Jon Van and Tim Jones, *Digital TV Promises an Unclear Revolution*, CHI. TRIB., Apr. 7, 1996, at C3. This plan was not supported by broadcasters since it required them to spend millions to be able to send the programming in analog and digital, but yet held no promise of new revenue. Congress suggested an immediate auction for the digital channels, rather than granting free digital licenses. The White House chimed in with a subsidy plan by the federal government, to speed the transition from fifteen years to half of that. See *id.* The Telecommunications Act of 1996 embraced free digital licenses for broadcasters, so the resulting debate centered on how to achieve the quickest transition. A quick transition is essential to have the analog spectrum returned, to ease overcrowding of the spectrum. The April 3 Order represents the FCC's victorious interpretation of a feasible and swift transition.

²⁷ See *FCC Approves Two Key Digital TV Orders, Clearing Way For Roll-Out By Industry*, DAILY REP. EXECUTIVES (BNA) NO. 65, Apr. 4, 1997, at A-31, A-32. 24 MHz of the 60 MHz recovered immediately is from channels 60-69, and is expected to be allocated to public safety agencies, such as police departments and fire stations that currently use wireless networks.

²⁸ However, Congressional action since the FCC Order would not allow the purchaser of analog capacity to claim the spectrum until digital penetration reaches 85%, which is not likely to occur for many years after the 2006 deadline. See *infra* Part III.

were “specifically not adopted” by the FCC in its April 3 Order.²⁹ Commissioner Chong called public interest obligations for broadcasters’ digital channels “premature,” and noted that broadcasters still have their current obligations.³⁰ The FCC expected the executive branch, Congress and the public to advise the Commission on both the nature and scope of public interest obligations.³¹ Broadcasters were put on notice regarding future obligations and the FCC “foreclose[d] nothing from its consideration or adoption.”³²

Current public interest obligations for broadcasters include carriage of three hours of children’s educational programming each week.³³ Cable operators are required to carry a certain amount of public affairs and educational programming. Four to seven percent of satellite broadcasters’ programming must include channels dedicated to public affairs or educational programming.³⁴

Past and present FCC chairmen have expressed hope that future obligations will be clear and commensurate with the new opportunities created by the gift of the digital channel.³⁵ Possibilities often mentioned include a required percentage of educational programming,

²⁹ FCC members were divided on whether to grant the digital spectrum without public interest obligations on broadcasters in place. Hundt had supported a plan calling for broadcasters to turn over 5% of their programming schedules of their digital channels to public interest programming. “These digital licenses should not be given out unless and until there is [a] . . . clear . . . and meaningful commitment to serve the public interest.” Hundt, *supra* note 5. The Administration’s plan allowed digital licenses to be issued, with the understanding that an advisory committee comprised of broadcast executives, lawmakers, educators, and other experts would make future recommendations. Broadcasters, such as Martin D. Franks, the senior vice president of Government Affairs at CBS, Inc., felt that the development of digital television was so unpredictable “that it did not make sense to mandate a uniform solution . . .” Mark Landler, *U.S. Wants Public Interest Rules For New Digital TV Channels*, N.Y. TIMES, Feb. 6, 1997, at D1, D10.

³⁰ See *FCC Agrees on DTV Buildout, Not on DTV Obligations and Must-Carry*, *supra* note 2, at 2.

³¹ See Hundt, *supra* note 5.

³² *Id.*

³³ Landler, *supra* note 29, at D10.

³⁴ *Id.*

³⁵ See e.g., Hundt, *supra* note 5, citing the Vice President’s Presidential Advisory Committee statement.

and airtime for political candidates.³⁶ During future debates on standards, broadcasters will probably argue that news and public affairs programming should qualify as public interest programming, even though they are not recognized as such under current law.³⁷

C. *Digital TV Buildout*

The FCC's plan for quick buildout of digital television programming occurs in stages. Commissioner Susan Ness called the anticipated deployment schedule "aggressive but achievable."³⁸ The earliest stations to go digital made voluntary commitments to be on the air within 18 months.³⁹ Hundt had desired an 18 month requirement for broadcasters in the top ten markets, hoping to spur purchases of digital TV sets in the 1998 holiday buying season.⁴⁰ The other Commissioners favored Ness' proposal to rely on voluntary commitments, believing that an eighteen month requirement was unrealistic. Such a requirement would have been difficult given issues such as tower and antenna problems, and possible equipment shortages.⁴¹ Approximately twenty-six stations made voluntary

³⁶ Airtime for political candidates is also raised in discussions of setting limits on campaign spending. Hundt mentioned the possibility of letting candidates use the public spectrum for free "is not unreasonable for broadcasters . . . in return for all they have been given." Hundt, *supra* note 5; *see also* note 151, *infra*.

³⁷ *See* Landler, *supra* note 29, at D1.

³⁸ Susan Ness, Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service, MM Docket No. 87-268. (Apr. 3, 1997. <<http://www.fcc.gov/Speeches/States/nessdtv.html>> No longer available on the Internet. Copy on file with Author.)

³⁹ *See FCC Approves Two Key Digital TV Orders, Clearing Way For Roll-Out By Industry*, *supra* note 27, at A-32.

⁴⁰ By most accounts, it would seem this requirement did not facilitate its goal. While the majority of stations who pledged to be on the air with a digital signal by November 1998 were, sets purchases were few. Various factors contributed to the lackluster sales, high prices and little digital programming among them. *See infra* Part VI.A; *see also infra* Part VI.E.

⁴¹ *See FCC Approves Two Key Digital TV Orders, Clearing Way For Roll-Out By Industry*, *supra* note 27, at A-32. *See also supra* note 9 and accompanying text.

commitments, and digital programming in the nation's top ten markets was planned for November 1, 1998.⁴²

After twenty-four months (April 1, 1999), all major network affiliates in the top ten markets are expected to broadcast digitally. Thirty-one months from the FCC Order (November 1, 1999), network affiliates in the top thirty markets are required to be digital.⁴³ After these initial phases, the buildout is not as rigidly defined. All commercial stations are required to be digital within five years (2002), and all non-commercial stations are expected to be digital within six years (2003).⁴⁴

While the buildout plan seems aggressive, it is not guaranteed to go smoothly or according to plan. The FCC stated that it would grant extensions where a licensee has been unable to meet its timing requirement due to circumstances that are either unforeseeable or beyond the licensee's control where the licensee has demonstrated it has taken reasonable steps to resolve the problem.⁴⁵ The FCC also anticipates reviewing the progress of the transition period with biennial reviews, beginning in the year 2000.⁴⁶ Additionally, the provisions in the Balanced Budget Act of 1997 grant Congress the right to extend analog service beyond the 2006 date if certain conditions exist.⁴⁷ These conditions include the failure of one or more of the largest TV stations in a market to begin broadcasting digital TV signals due to causes outside the broadcaster's control, or if fewer than 85% of the TV households in a market are able to receive digital TV signals.

⁴² NBC pledged that 80% of its owned and operated stations would be digital within 18 months, with ABC at 60%, CBS at 57%, and Fox, 33%. See Hundt, *supra* note 5.

⁴³ *FCC Approves Two Key Digital TV Orders, Clearing Way For Roll-Out By Industry*, *supra* note 27 at A-32. The November 1999 milestone is significant because digital signals are expected in 53% of the country. See also Hundt, *supra* note 5.

⁴⁴ Hundt expressed concern that a majority of TV stations were not required to go digital before five years. He hoped the FCC would reconsider this decision in the future. See Hundt, *supra* note 5.

⁴⁵ See *Commission Adopts Rules for Digital Television*, *supra* note 1.

⁴⁶ See *Digital Television Tower Siting Fact Sheet and Frequently Asked Questions*, (last visited April 26, 1999) <<http://www.fcc.gov/mmb/prd/dtv/>>.

⁴⁷ See *id.*

III. CHANGES TO THE FCC TIMELINE

The summer of 1997 saw a heated debate that eventually resulted in legislative actions that now have the 2006 shut-off date in serious doubt. In June, lobbyists for the TV broadcasting industry sought a provision to keep their second channels beyond 2006 where more than 5% of homes still watched conventional analog TV.⁴⁸ FCC Chairman Hundt said of the possible modifications: "what a result that would be: Give the digital television licenses to broadcasters so no competitors could get them; tell broadcasters they don't really have to build the digital television systems and then tell broadcasters their reward for not using this incredibly valuable property is they never have to give back their analog license."⁴⁹ In July, the Administration opposed any extension of the 2006 deadline.⁵⁰ Uncertainty as to when the spectrum would be returned would cause bidders to bid less when the spectrum is auctioned in 2002, according to Franklin Raines, director of the Office of Management and Budget.⁵¹

By August, Congress had approved a plan to allow broadcasters to keep the second channel past 2006 only when at least 15% of households still lacked access to digital signals.⁵² In addition, the deadline will be waived where the digital change is behind schedule.⁵³

⁴⁸ The provision was sponsored by Representative Billy Tauzin, chairman of the telecommunications subcommittee. He stated his goal was to protect consumers who have analog sets and cannot afford to purchase digital sets. See Joel Brinkley, *Lobbyists for TV Angle to Elude Rules to Return Free Channels*, N.Y. TIMES, June 25, 1997, at A1.

⁴⁹ *Id.*

⁵⁰ See e.g., Shapely, *supra* note 12, at D12.

⁵¹ See *id.* Also, public safety agencies and local governments were fighting any extension, believing that an extension might delay the spectrum being given to them. The 24 MHz set aside for public safety communications may not be available in large cities until the end of the digital TV transition.

⁵² See Deborah Shapely, *Broadcasters Get Extra Time for TV Changeover*, N.Y. TIMES, July 28, 1997, at D5.

⁵³ See *id.* "Such markets are defined as those in which one of the four major networks is not broadcasting digitally or where digital set-top [converter] boxes are 'not generally available.'" *Id.*

When this 85% requirement of digital penetration will be met is difficult to determine. Analogies are continually made to other "revolutionary" products, such as color TV, VCR's and CD's. Color televisions took twenty-two years to reach market penetration of 85%,⁵⁴ VCR's took sixteen years, and CD's have reached 68% after thirteen years.⁵⁵ "[T]he chances of consumers hearing a consistent, understandable, objective marketing message to help them make decisions about digital TV are near zero."⁵⁶ Joseph Flaherty, senior vice president for technology at CBS says, "If [consumers are] confused, they'll just put their money right back into their pockets."⁵⁷ It is easy to understand why so many people, supporters and critics alike, do not expect the analog spectrum to be returned in the foreseeable future, if ever. It is rare for 85% of the people in this country to agree on anything; getting 85% of them to spend a great deal of money on something may be impossible. Although all digital participants see the digital transition as an enormous opportunity and are working hard to make it a reality, the FCC's goal of a quick spectrum return seems to be a fading memory.

IV. THE TECHNOLOGY OF DIGITAL TV

Another topic for debate was the appropriate standard for a digital TV format. Formats are the different types of signals that will be broadcast and displayed on digital TV. The FCC did not mandate a particular standard.⁵⁸ Fortunately, the debate over standards was mollified somewhat by Intel's development of a chip that can

⁵⁴ See Russ Mitchell, *TV's Great Leap Forward: Digital TV Arrives Soon. But Don't Throw Out Your Old Set Just Yet*, U.S. NEWS & WORLD REPORT, Apr. 20, 1998 at 46, 49. It took eight years before color television penetrated 10% of the TV market, even though color TV marketers had a straightforward explanation of the product, which is certainly not the case with digital TV. See *id.*

⁵⁵ See West, *supra* note 13, at S7.

⁵⁶ See Mitchell, *supra* note 54, at 48.

⁵⁷ *Id.* See also *infra* Part VI.G.

⁵⁸ See West, *supra* note 13, at S9. The current FCC chairman agrees with this decision. William E. Kennard approves of the marketplace formulating a standard rather than mandating a particular standard. He believes the digital transition is not the sort of transition that lends itself to central industrial planning.

incorporate all of the eighteen digital formats broadcasters are ever likely to transmit.⁵⁹

There are two basic categories of formats: interlaced scanning and progressive scanning. Conventional analog TV is made of horizontal lines comprised of tiny dots called pixels. An electron gun inside the TV paints those lines one by one, from top to bottom, thirty times per second. There can be as many as 520 lines on a conventional TV set, although most screens show fewer lines. Together the lines comprise a single picture.⁶⁰

Analog lines have always been delivered via interlaced scanning. An analog TV channel is not big enough to accommodate an analog TV picture all at once, so each picture is sent in two pieces. The electron gun displays every odd-numbered line in a picture from top to bottom, then goes back to display the even lines, to interlace a single picture. Each half takes 1/60th of a second, so to the human eye it looks like a single picture. However, because it is really two halves trying to become one, there is often some mismatch that is seen as a flicker or blur.⁶¹

Digital signals can be squeezed much more tightly than analog waves. In digital, all transmissions are reduced electronically to a code of 0's and 1's. Digital programs take up only what is required for a particular unit of information. Much more information can be packed into a single TV channel. The compression allows progressive scanning, where the electron gun paints lines on the screen one after another, resulting in one solid picture.⁶²

Why is there such debate, if outdated analog transmissions are interlaced and progressive scanning is the wave of the future?⁶³

⁵⁹ Manufacturers and broadcasters have as yet voluntarily stayed within the eighteen formats; if that should change, and standards narrowed or expanded, a consumer might be forced to update his equipment. See West, *supra* note 13 at S15.

⁶⁰ Mitchell, *supra* note 54, at 52.

⁶¹ See *Id.*

⁶² See West, *supra* note 13, at S17 for a more comprehensive look at the technological complexity of digital television.

⁶³ The Department of Defense uses progressive scanning for all of its visual displays. Computer monitors and medical imaging uses progressive scanning as well. See Mitchell, *supra* note 54, at 52.

Interlaced scanning was included as a bridge to the day when technology creates progressive pictures with 1080 lines or more, which seems to be the ultimate goal.⁶⁴ 1080-P⁶⁵ is the highest resolution format, but is beyond the capacity of current TV channels.⁶⁶

720-P is currently the highest level progressive signal that will fit in a TV channel. Because progressive signals are cleaner than interlaced ones, experts argue that 720-P looks at least as good as 1080-I. NBC and CBS favor interlaced scanning. ABC and FOX, along with many in the computer and cable industries, prefer progressive scanning. Every broadcaster "insists that its own format is the one that favors consumers most."⁶⁷

In addition to the progressive versus interlaced debate, the number of horizontal lines that should be included has become a major source of contention. Standard definition digital TV ("SDTV") with 480 horizontal lines⁶⁸ is less expensive to produce and allows broadcasters to fit several programs onto their digital channel.⁶⁹ As many as four or five SDTV programs can be transmitted simultaneously within a broadcaster's 6 MHz channel.⁷⁰ A single program broadcast in high definition digital TV ("HDTV") may consume all or a majority of the 6 MHz.⁷¹

⁶⁴ *Id.*

⁶⁵ When discussing formats, the number refers to the number of horizontal lines displayed on the screen, and the P or I stands for progressive or interlaced scanning, respectively.

⁶⁶ Joel Brinkley, *Ready or Not, Here Comes HDTV: But the Industry's Vision is Still Far from Focused*, N.Y. TIMES, Apr. 6, 1998, at D2.

⁶⁷ See Mitchell, *supra* note 54, at 49.

⁶⁸ If shown progressively, SDTV broadcast digitally is a visual improvement over analog transmissions, although the number of horizontal lines displayed on each screen is similar.

⁶⁹ This is known as "multichanneling."

⁷⁰ Cable can carry more than twelve signals within each of its 6 MHz channels. See West, *supra* note 13, at S17.

⁷¹ Broadcasters do not have to choose to transmit in high definition or in standard definition. The receiver will decode whatever the broadcaster is transmitting. For example, after using the entire channel for a high definition telecast of a live football game, a station could then send two high definition movies (which can withstand greater compression because they are not being transmitted live), or multiple standard definition channels. See Ness, *supra* note 38.

V. THE POLITICS OF TECHNOLOGY

The 480, 720, or 1080 decision is more than simply deciding which picture is the prettiest. Politics collide with technology, because the FCC, while not mandating HDTV, certainly had HDTV in mind when giving broadcasters their second channel. Considering the risk and expense involved, the digital allotment was seen as an incentive to take those risks and spend that capital. ABC and Fox have both hinted that their networks would broadcast only in 480-P, but retreated when Congress warned there could be "severe penalties" for that course of action.⁷² 1080-I, the format preferred by NBC and CBS, meets the definition of HDTV. This format provides twice the line count of analog television. ABC and Fox, after the threat of congressional censure, have indicated a preference for 720-P. Even though there are fewer lines, both of these networks say the flicker-free progressive image makes 720-P a better visual choice.⁷³

Still, many broadcasters neglect to mention that the bulk of digital programming will be in 480-P.⁷⁴ 480-P is more economically efficient for broadcasters, because it is much easier to convert programming shot on 35-mm film to HDTV, than to shoot original TV video in high definition.⁷⁵ The lower resolution also allows more channels to be transmitted at once. Whether multichanneling is good for consumers or not, favoring multichannel over HDTV does not square with the vision that was drawn by Congress when it granted the free channels. The issue of formats remains "political dynamite."⁷⁶

VI. PARTICIPANTS IN THE DIGITAL REVOLUTION

"[The FCC's] decisions today ensure a bright future for free, over-the-air broadcasting and thereby secure its continuing vitality as the

⁷² See Brinkley, *supra* note 66, at D1.

⁷³ The Advanced Television Systems Committee, the digital TV standard setter, says 720-P qualifies as HDTV. See Mitchell, *supra* note 54, at 52.

⁷⁴ See *infra* Part VI.A.

⁷⁵ See Mitchell, *supra* note 54, at 53. The great majority of prime time programs and movies are shot on 35-mm film.

⁷⁶ See *id.*

principal source of news, information and entertainment in homes throughout the nation.”⁷⁷

“History will record April 3, 1997 as the birthday of digital television. The birthday present goes to the nation’s consumers.”⁷⁸

“[T]he broadcasters receive a public good valued at \$11 billion to \$70 billion for free, to use with maximum flexibility and phantom public service obligations, and a deadline for the return of existing analog spectrum that everyone knows will not happen.”⁷⁹

As previously mentioned, the spectrum loan (or gift) was not without controversy. However, it was clear that the FCC had political support, both from the executive and legislative branches, to help initiate the transition to digital. Even with the Congressional actions that relaxed the deadline for returning the second channels, all participants in the transition realized the government’s commitment to digital was real. If the April 3 decision was commended by many groups brimming with energetic optimism for a revolutionary product, the following months saw the digital participants begin the arduous task of convincing everyone else that digital TV is revolutionary. All participants have their own expectations and notions of how they are going to serve the American consumer. All face obstacles in the next decade, some political, some economic, all complicated. One considerable reason for the difficulty will be that several industries, accustomed to working independently and often as competitors, will now be forced not only to work together, but also to depend on one another.

A. Broadcasters

Some see the digital transition as an opportunity for broadcasters to reinvent themselves, hopefully stopping their declining audience.⁸⁰

⁷⁷ *FCC Approves Two Key Digital TV Orders, Clearing Way For Roll-Out By Industry*, *supra* note 27, at A-32.

⁷⁸ *FCC Agrees on DTV Buildout, Not on DTV Obligations and Must-Carry*, *supra* note 2, at 2.

⁷⁹ *FCC Approves Two Key Digital TV Orders, Clearing Way For Roll-Out By Industry*, *supra* note 27, at A-32.

⁸⁰ See Joel Brinkley, *Networks and Set Makers In Standoff Over HDTV*, N.Y. TIMES, Aug, 29, 1997, at D5.

Digital TV's flexibility offers broadcasters a chance to recapture viewers through new services. "For example, TV programs can be broadcast with a variety of languages and captions, and sports programs can be broadcast so that the individual viewer might select his or her favorite camera angle or call up player statistics, game scores or other information."⁸¹ The stunning picture of digital TV may lure back some viewers who had turned to cable because of deficiencies in the broadcast picture.⁸²

The stunning picture may not be as stunning as possible. One major decision for broadcasters is the decision of how often⁸³ to broadcast in high definition, because SDTV allows multichanneling. Multichanneling offers the possibility of introducing pay TV into the broadcast spectrum,⁸⁴ or simply the chance at being more responsive to the needs of the viewers.

The short term goal for broadcasters after the government encouragement to go digital was to create demand for digital TV by providing "ooh and aah programming" on the few sets available, such as at retail demonstrations and sports bars.⁸⁵ Short term decisions about programming saw an emphasis on sports programming and motion pictures. ABC launched its digital broadcasts with "101 Dalmatians," and showed "Mission Impossible" and "Forrest Gump" in the fall of 1998. NBC has committed to broadcast "The Tonight Show With Jay Leno" in HDTV, beginning in the spring of 1999, along with the movies "Men in Black" in 1999 and "Titanic" in 2000. CBS has broadcast four pro-football games and one of its primetime dramas, "Chicago Hope" in HDTV.⁸⁶

⁸¹ *Digital Television Tower Siting Fact Sheet and Frequently Asked Questions*, *supra* note 46. Broadcasters can transmit any information which can be translated into digital bits, such as an entire edition of a newspaper, telephone directories, and interactive educational materials. *Id.*

⁸² *See West, supra* note 13, at S27.

⁸³ The question is more likely to be "how often" rather than "whether" because of the threat of congressional censure. *See supra* Part V.

⁸⁴ *See West, supra* note 13, at S29. *See also infra* Part VIII.B.

⁸⁵ Jon LaFayette, *Ready or Not, Here Comes the Future*, ELECTRONIC MEDIA, Oct. 26, 1998, at 30.

⁸⁶ *See West, supra* note 13, at S5; *see also* Brinkely, *supra* note 66, at D2.

The ambitious digital programming kudos are deserved not by the networks, but by channels such as PBS, HBO and Discovery. PBS broadcast a special "Digital Week" in November of 1998 that boasted the first national broadcast of a program conceived from the start as an HDTV production.⁸⁷ HBO purports to have plans for 17 hours of daily digital programming, anticipated in the spring of 1999.⁸⁸

Broadcasters believe that price and content are the most important variables for consumers when purchasing a digital set.⁸⁹ So while they realize that the lack of programming may dissuade consumers from making purchases of expensive digital sets to receive only hours of the amazing pictures, broadcasters are waiting until more sets are purchased to add to their programming lineups. Steve Effros, president of Cable Telecommunications Association, noted that "a consumer is not going to spend \$7,000 on a TV set for four [CBS football] games. In fact, you could fly to all four of the games, watch them live and still have a lot of money left over."⁹⁰ The exorbitant costs of filming and transmitting in HDTV have created a "chicken and egg" type problem. Broadcasters are reluctant to convert or produce HDTV programming without more digital receivers, while apprehensive consumers are waiting for more programming before investing in the future.

As of November, 1988, one especially reluctant broadcaster is Sinclair Broadcast Group ("Sinclair"). Even though Sinclair owns several stations slated to begin transmitting digital signals in November 1999, it has not purchased any digital transmissions equipment.⁹¹ "[I]t's prudent to wait and see the public reaction to digital before we start spending serious capital."⁹²

⁸⁷ See LaFayette, *supra* note 85, at 34. "101 Dalmations" was the first nationally telecast digital program, but was originally shot on 35 mm film and upconverted to HD.

⁸⁸ See West, *supra* note 13, at S5.

⁸⁹ See *Id.*, at S7.

⁹⁰ Lee Hall, *Eastern Show's verdict on HDTV: See You Later*, ELECTRONIC MEDIA, Nov. 2, 1998, 6, at 29.

⁹¹ See Dickson, *supra* note 7, at S37.

⁹² See Don West, *supra* note 13, at S39. Nat Ostroff, Sinclair's vice president of new technology is critical of the limited HDTV programming plans announced by ABC, CBS, and NBC. "They're disappointing and inadequate given the magnitude of the investment being asked." *Id.*

While Sinclair has been the most vocal broadcaster with complaints about the high cost of going digital, other broadcasters probably feel the same way. The free second channel was seen as an incentive to allocate the necessary capital, but now that the planning stages are complete and the spending stages are here for the foreseeable future, broadcasters are dragging their feet. Given the FCC timeline, though, the broadcasters may be looking for cost-cutting solutions, but most are not trying to avoid going digital altogether. Sony vice president Larry Thorpe has a word of caution about the cheaper alternative of standard definition digital:

Making the transition to standard-definition digital broadcasting "will impact every camera, every monitor, every switcher, every recorder you have. It's a complete change-over of equipment. That's a huge cost. And if you guess wrong, if HDTV takes off, you're going to have to do that all over again a few years from now."⁹³

Broadcasters surely believe they are gambling with their investments. In addition, the large investments will currently affect, at most, 30% of the nation's homes. Approximately 70% of households receive their TV fare from cable transmissions.⁹⁴

B. *Cable*

"Cable would like nothing better [than] for digital TV to crash and burn. . . . They become the real gatekeeper."⁹⁵ Cable is in over 70% of the nation's homes, and is not, as yet, required to carry broadcasters' digital transmissions. This means cable can convert to digital on its own schedule, subject to competitive, consumer, and political pressures, but not government mandates. The cable industry cares less

⁹³ Joel Brinkley, *Technology: High-Definition Television: Screens Reflect Back the Business Interests of the Executive Beholder*, N.Y. TIMES, Oct. 6, 1997, at D5.

⁹⁴ Network broadcasters also must confront the issue of control of the usage of the additional capacity. In recent negotiations between networks and their affiliates, control has been a central issue, and battles have arisen over exclusivity of programming and NFL financing. Industry analysts predict the struggle for control will be another obstacle for broadcasters.

⁹⁵ See LaFayette, *supra* note 85, at 34.

about picture quality (HDTV programming) than about adding more fee-generating channels using digital compression.⁹⁶

Even though not ordered to go digital, cable recognizes the potential customer loss if it refuses the digital upgrade. "We can't afford in the marketplace to ever have a picture that is not as good as one of our competitors."⁹⁷ Cable is spending approximately \$6 billion annually to upgrade plant infrastructure for digital services.⁹⁸ However, many cable executives think the cable transition to digital will not be occurring in tandem with the FCC's expected timeline for broadcasters. "We [cable] weren't the ones who created a lot of expectations at Christmas 1998. . . . All of this is really complicated. It doesn't lend itself to rigid timetables."⁹⁹

Cable expects digital to allow it to deliver more signals. "[W]e know that people always want more. More choices, more options, more opportunities."¹⁰⁰ High definition is just one service cable hopes to offer, along with more programming options and Internet access services.¹⁰¹ Cable executives believe they have a more realistic view about the transition and analog's staying power. Cable executives seem to accept the fact that analog will be around for the foreseeable future.¹⁰² NCTA's Anstrom says, "anything we do to start changing [the fact that average cable customers will continue to receive 60 to 80 analog channels] . . . is going to create unholy hell and will have the effect of stopping this whole digital transition."¹⁰³

⁹⁶ See Mitchell, *supra* note 54, at 47.

⁹⁷ West, *supra* note 13, at S27 (quoting NCTA's Anstrom). He added, "We can't just use digital for more television. We have to use it for better television, too." *Id.*

⁹⁸ *Id.* at S11.

⁹⁹ *Id.* at S13.

¹⁰⁰ *Id.*

¹⁰¹ Only a small percentage of equipment the cable industry is purchasing is capable of transmitting high definition programming. "Nobody's even talking about high definition," a cable industry official said. Brinkley, *supra* note 4 at D2.

¹⁰² See West, *supra* note 13, at S29. Anstrom says there is a "little secret we all know: that broadcasters are never going to give back their analog spectrum." *Id.* 250 million analog sets "deliver pictures that people are happy with. The notion of disenfranchising 250 million sets gives us pause." *Id.*

¹⁰³ *Id.*

With such a consumer stronghold, cable has the potential to stop, or at least control, the digital transition. “[C]able’s participation in [digital] transmission is seen as critical not only for the broadcast networks, but for the technology itself.”¹⁰⁴ While most cable operators are maintaining consumer-friendly, “we’ll go digital, too” attitudes, there are notable exceptions. The chairman of TCI, one of the largest cable companies in the United States, declared at the 1998 NCTA convention that some broadcasters’ high-definition signals were “bandwidth hogs” and “they’re not getting on my systems.”¹⁰⁵ Add to this cable’s position on forced carriage of broadcasters’ digital signals - “We firmly believe [digital must carry] isn’t [constitutional] and . . . we will never agree to any double-dose of must carry. . . .”¹⁰⁶ and it becomes evident that cable executives are prepared to fight for the freedom to control their programming. Given its extensive consumer base, cable may be in a position to win that fight, and control the development of digital television, unless the government steps in.¹⁰⁷

C. *The Satellite Industry*

Direct broadcast satellite (“DBS”) providers, such as DirecTV and Echostar, already receive digital programming, which can easily be shown on new digital TV sets.¹⁰⁸ Satellite has distinct advantages over both other broadcasters and cable. A DBS signal can reach the entire country in one leap, and its capacity currently exceeds terrestrial broadcasters or cable.¹⁰⁹ Satellite systems would still have to reduce the number of channels they can offer to provide high definition programming, because of the bandwidth HD requires. “Satellite TV

¹⁰⁴ See Jones, *supra* note 9, at C1.

¹⁰⁵ See Lafayette, *supra* note 85, at 34.

¹⁰⁶ See Decker Anstrom, *Should Cable Provide Digital Must-Carry?: No, Cable Networks Shouldn’t Be Relegated to Second-Class Status*, ELECTRONIC MEDIA, Jan. 18, 1999 at 36.

¹⁰⁷ See *infra* Part VIII.A.

¹⁰⁸ See Brinkley, *supra* note 4, at D2.

¹⁰⁹ See West, *supra* note 13, at S27.

has been designed to be one step ahead of the competition. HDTV was part of [its] architecture. . . ."¹¹⁰

Satellite providers can be an influential wildcard in the digital transition, given the possibility of future alliances. For example, DirecTV has discussed integrating off-air broadcast signals into a single service offering. If such an integration occurs, broadcasters could begin to build their digital base, in the hopes of reducing cable's 70% market share. DBS providers are among the most ambitious in programming expectations, with DirecTV planning on broadcasting two channels of high definition digital programming beginning in 1999.¹¹¹ Currently, DBS providers have about 8% of the TV market, with more than 4.6 million on the DirecTV-USSB platform, 2.3million on PrimeStar, and 2 million on EchoStar.¹¹² Unity Motion, an HDTV provider, plans to support a 100,000 subscriber base by spring of 1999.¹¹³

D. *The Computer Industry*

While other participants in the digital transition have basically maintained a clear focus of their objectives, the computer industry has been inconsistent, or unsuccessful, in formulating a digital business plan. In early 1997, the computer industry hoped to elbow its way into the \$150 billion replacement market for television sets.¹¹⁴ The future computer executives hoped for was for the personal computer ("PC") to migrate from the home office to the family room. During this period, PC manufacturers tried to persuade the FCC commissioners and broadcasters that progressive scanning was clearly superior to interlaced scanning.¹¹⁵

Arguments used to illustrate the benefits of creating a PC with TV capabilities (or vice versa) included the following: (1) consumers want

¹¹⁰ See Dretzka, *supra* note 9, at C1.

¹¹¹ See Mitchell, *supra* note 54, at 47.

¹¹² In January 1999, DirecTV announced an agreement to acquire PrimeStar and its related high-power Tempo satellites.

¹¹³ *Id.*, at S25. These figures are from November, 1998.

¹¹⁴ See Joel Brinkley, *Building Your Next TV*, N.Y. TIMES, Mar. 28, 1997, at D1.

¹¹⁵ Progressive scanning is used for computer monitors. See *supra* note 63 and accompanying text.

interactive viewing experiences; (2) viewers are as interested in browsing the World Wide Web (“the Web”) as in watching traditional TV programming; (3) high definition pictures alone will not be enough to sell new digital sets.¹¹⁶ However, given Intel’s creation of a chip that is compatible with any digital format broadcasters choose to transmit,¹¹⁷ and the disappointing sales of Web TV,¹¹⁸ the computer companies are now pursuing individual and varied strategies for getting a piece of the digital pie. Intel, for example, is using its format converter to align itself with broadcasters to market its interactive television technologies.¹¹⁹

As of 1998, computer executives were coming to terms with marketplace realities.¹²⁰ Manufacturers are reluctant to build digital sets with features that can turn the TV into a computer. “At present we are not planning to put any intelligence capabilities in our digital

¹¹⁶ The consumer electronics industry disagrees. It claims that past experience demonstrates consumers are most interested in picture quality and cost when they purchase a new TV, there are few regular browsers of the Web, and computers are difficult devices — most people prefer the simplicity of their TV sets. Manufacturers of TV-compatible PC’s respond by saying the new generation of PCs will be easier to use than conventional computers. In addition, “PC theaters” (a PC that has successfully migrated to the family room) can be used to watch conventional TV programming, and also browse the Web or play interactive games. See Brinkley, *supra* note 114, at D2.

¹¹⁷ See *supra* note 59 and accompanying text.

¹¹⁸ Web TV boxes allow consumers to browse the Web on conventional televisions. The product is aimed at households without PCs. See Brinkley, *supra* note 114, at D2.

¹¹⁹ See Joel Brinkley, *Media: A Year in the Life of Digital Television, A Time of Rethinking for Executives*, N.Y. TIMES, Apr. 13, 1998, at D7.

¹²⁰ The concept of interactive television, “a sort of cable TV on steroids,” with on-line shopping and pay-per-view movies, proved prohibitively expensive. Computer manufacturers refused to be disheartened. “[T]he merger of the two technologies [computers and televisions] will be much easier when digital television comes along.” See Brinkley, *supra* note 114, at D2. Yet, electronics manufacturers have been swayed more by statistics than the computer industry’s visions. Almost every American home has at least one TV, while, after fifteen years, computers are not yet in 50% of homes. In addition, while computer executives are lauding interactivity and the Web, only about 12% of Americans have regular access to the Internet. *Id.*

TV's."¹²¹ Some set makers said they might experiment with offering Internet access. Anything more, in their view, risks raising their costs by including options most consumers will not want.¹²²

Richard E. Wiley, a former chairman of the FCC and the chair of the FCC's Advisory Committee on Advanced Television Service that guided the digital development for almost a decade before the April 3 FCC Order, has some advice for the computer industry.¹²³

The computer people have always had the right vision for themselves and for the public — a vision of smaller screen, up close, progressive scanning and a lot of information for their audience. Where they went wrong was in trying to impose their vision on other industries. Broadcasters have a vision too, which is wide screen and vivid pictures. The two may converge in the future with PC/TVs. But, again, I don't think we should let one industry foreclose another industry's vision.¹²⁴

Computer executives have wisely narrowed their goals for the immediate future from "convergence" to data-enhanced broadcasts.¹²⁵ Intel and Microsoft are actively exploring datacast technology. Proposed programming for datacasting includes award telecasts, NFL games, MTV and The Weather Channel.¹²⁶

E. *The Consumer Electronics Industry*

The replacement market for digital sets is currently estimated at \$150 billion. Therefore, consumer electronics manufacturers should not have a care in the world, right? Not so. The set makers would like to earn big profit margins from digital TVs without causing buyers of regular analog sets to put off their purchases.¹²⁷ However, all the confusion about the digital transition impacts set manufacturers and retailers most directly. The more conflicting information a consumer hears, the less likely he is to buy.

¹²¹ *Id.*

¹²² *Id.*

¹²³ *See West, supra* note 13, at S7.

¹²⁴ *Id.*, at S17.

¹²⁵ Data-enhanced broadcasts are also known as "datacasts." Datacasting allows the viewer to request information about the program being viewed.

¹²⁶ *See Richard Tedesco, The PC Is Still Missing in the PC/TV, BROADCASTING & CABLE*, Nov. 16, 1998 at S55, S56.

¹²⁷ *See Mitchell, supra* note 54, at 47.

The confused consumer is sure of one thing: a new HDTV set¹²⁸ is expensive. Estimates prior to the sets becoming available proved to be extremely conservative. Two articles immediately following the April 3 Order quoted prices as “upwards of \$2,000”¹²⁹ and “as much as \$5,000.”¹³⁰ When sets became available in late 1998, most hovered in the \$8,000 range.¹³¹ Part of the disparity can be explained by set manufacturers’ decision to enter the market with high-end products loaded with options and added features,¹³² in an effort to make the “maximum possible impact.”¹³³

More importantly, manufacturers do not expect to sell many sets in the first year. “[T]he costs are extraordinarily high because the volume is so small.”¹³⁴ The small volume can be attributed to a variety of

¹²⁸ The Consumer Electronics Manufacturers Association (“CEMA”) has stipulated the definitions of new digital products. An HDTV set must be able to receive all eighteen formats and display them to the highest capability of the monitor display, display a digital picture in 720P or 1080I or better, and display a widescreen picture. SDTVs must be able to receive all eighteen formats, and display them at resolution levels lower than HDTV (typically 480I or 480P). See Greg Tarr, *Consumer Electronics Manufacturers Take Different Routes to DTV*, BROADCASTING & CABLE, Nov. 16, 1998, at S45, S50.

¹²⁹ Taran Provost, *TV Going Digital: The future is almost here*, (visited Apr. 26, 1999) <<http://cgi.pathfinder.com/time/daily/0,2960,7924,00.html>>.

¹³⁰ *FCC Agrees on DTV Buildout, Not on DTV Obligations and Must-Carry*, *supra* note 2, at 3.

¹³¹ Some sets were seemingly less expensive, such as Mitsubishi’s model 5803, which sells for \$3,999. However, purchasers also needed to buy a \$3,000 converter box. See Jill Bilzi, *The Early Adopters Are Getting a Jump on HDTV*, BROADCASTING & CABLE, Nov. 16, 1998 at S40, S41.

¹³² See Joel Brinkley, *F.C.C. Responds to Its Digital-TV Critics*, N.Y. TIMES, Sept. 16, 1998, at C2.

¹³³ See Tarr, *supra* note 128, at S50. Manufacturers noted it was important for the industry to show the best products they could at the beginning, so consumers who see HDTV for the first time would be impressed. See Joel Brinkley, *HDTV: High In Definition, High in Price*, N.Y. TIMES, Aug. 20, 1998, at G1, G8.

¹³⁴ Brinkley, *supra* note 133, at G8 (quoting Mark Knox, a senior manager for Samsung Electronics Company).

reasons, including the high prices,¹³⁵ lack of HDTV programming,¹³⁶ and the large size of the sets.¹³⁷ Manufacturers did not expect to make more than 100,000 sets in 1998.¹³⁸

Manufacturers do expect set prices to drop quickly. Mark Knox of Samsung expects an HDTV set to sell for \$3,000 by 2002. Ed Milbourn, a senior Thomson executive, believes his company could sell an HDTV set for half the current price by the time the second generation sets come out in late 1999 or 2000. Robert Perry, director of marketing for Mitsubishi Consumer Electronics said "they'll cost \$3,500 a couple of years from now."¹³⁹ The second generation sets should also be less expensive because they will offer a high definition picture without all of the costly extra features.

Economists are not as optimistic as manufacturers about prices falling. Todd Thibideaux, a senior economist with CEMA, indicated that prices for new products generally fall 50% after a decade.¹⁴⁰ If he is correct, the sets will still cost nearly \$4,000 in 2007, a year after the FCC hoped to conclude the digital transition. It is hard to anticipate whose figures will turn out to be more accurate. An increase in digital receivers will spawn both an increase in digital programming from

¹³⁵ William Kennard, the current chairman of the FCC, said no one should be concerned with the high initial prices. "If you control for inflation, the first color sets in 1955 cost about \$4,500." Brinkley, *supra* note 132, at C2.

¹³⁶ See *supra* Part VI.A. Joseph Flaherty of CBS noted, "[i]f everybody waits for the other guy in this chicken-and-egg thing, . . . that won't help the manufacturers sell even one receiver." Brinkley, *supra* note 80, at D5.

¹³⁷ Most manufacturers made rear-projection sets, which are about as large as a compact car. Sony made a table-top 34-inch model with a picture tube. More than 90% of analog sets sold have picture tubes, and are known as "direct view" sets. Direct view digital sets are more complicated to manufacture and cannot yet display an HDTV image at the highest level of resolution. See Brinkley, *supra* note 132, at C2. Plasma sets, the thin screens that hang on the wall, are currently manufactured only by Pioneer and cost approximately \$25,000. See West, *supra* note 13, at S47. The small size is due to a separate tuner. Plasma sets cannot yet display an 1080i signal. See Richard Folkers, *Prices for HDTV Hurt Your Eyes*, U.S. NEWS & WORLD REPORT, Apr. 20, 1998, at 54.

¹³⁸ See Brinkley, *supra* note 133, at G1.

¹³⁹ *Id.*, at G8.

¹⁴⁰ VCRs cost an average of \$1,955 in 1974. It took until 1983 for the price to fall 50%. See *id.*

broadcasters, and lower prices from manufacturers. Once that advantageous cycle has begun, the manufacturers may be proven right. Right now, the manufacturers are counting on the universal appeal of television to drive the transition. "Americans want the biggest, fattest, best picture."¹⁴¹

Long term estimates are just as ambiguous. Thibideaux's research shows that consumer electronics products reach mass acceptance only after the price falls below \$500. CEMA projects 30 million digital sets sold by 2005.¹⁴² An independent study concludes that 1 million homes will own HDTV sets by 2003,¹⁴³ while another predicts 250 million sets sold over the next decade.¹⁴⁴ These studies come to such disparate conclusions in part by interpreting vague statistics. For example, consumers spend \$2.4 billion annually on color TVs priced upward of \$1,300,¹⁴⁵ which seems to support the notion that price is not an insurmountable obstacle for a television fan. However, a study from PriceWaterhouseCoopers concludes consumers are only willing to pay an additional \$90 for a television set capable of receiving high definition images.¹⁴⁶ No one wants to speculate when, if ever, digital receivers will fall to that price.

Manufacturers hope to make the best of a difficult transition, regardless of how quickly digital sales rally. Because most manufacturers expected an initially small volume of sales, they treated HDTV as a customer lure to retail showrooms, where, once consumers are shocked by the outrageous prices, they can choose a large screen analog TV for considerably less. CEMA reported record sales for large

¹⁴¹ Folkers, *supra* note 137, at 54 (quoting Gary Sharpiro, the CEMA president).

¹⁴² See West, *supra* note 13, at S3.

¹⁴³ This study was conducted by Forrester Research. The study was criticized by CEMA because it did not include interviews with consumers. See Lee Hall, *Not a Pretty Picture for HDTV, Study Says*, ELECTRONIC MEDIA, Dec. 14, 1998, at 4, 4.

¹⁴⁴ Warburg Dillon Read's report notes that "the success of large-screen television sets and home theater sets" indicates that "the American public has shown that it places a great value on the entertainment experience." Diane Mermigas, *Content is the Key to Selling HDTV*, ELECTRONIC MEDIA, Oct. 26, 1998, at 32, 32.

¹⁴⁵ *Id.*, at 36.

¹⁴⁶ See Hall, *supra* 143, at 43.

screen analog televisions in 1998.¹⁴⁷ Manufacturers cannot yet afford to support digital sets exclusively, since digital sales comprise a relatively small percentage of a manufacturer's business, and a decline in sales of analog sets will offset, or, more likely, cannibalize, digital gains.

Retailers are quick to share their "customers-are-absolutely-blown-away-by-HDTV" stories.¹⁴⁸ For retailers, the transition to digital has meant store remodeling to accommodate the larger HDTV sets, rewiring for digital signals, and the training of sales personnel to combat consumer confusion. Many are holding seminars to educate the public; demonstrations can draw crowds of thousands. Mark Esposito, the first Texas retailer to sell an HDTV set to a consumer, declared "[w]e're embracing it [digital TV] fully so our customers will too. . . . We wanted to show people the future is now."¹⁴⁹

F. *The Government*

"It's very important that broadcasters, cable operators and set manufacturers have a common vision on this thing [digital TV],"¹⁵⁰ former chairman Wiley stated. Given the distinct goals each industry involved in the digital transition hopes to achieve, a common vision has not yet been found. The executive branch, acting primarily through the FCC, has decided not to dictate a vision, instead allowing the industries to work out problems for themselves.¹⁵¹

Given the vague nature of the April 3 FCC Order, which left many issues to be resolved by the marketplace, the FCC's passive role is not surprising. The new FCC chairman has indicated that he is

¹⁴⁷ See Tarr, *supra* note 128, at S47, S48. One may wonder if "playing both sides of the fence" will backfire; only time will tell. *Id.*

¹⁴⁸ See Bilzi, *supra* note 131, at S40.

¹⁴⁹ *Id.*, at S41, S43.

¹⁵⁰ See West, *supra* note 13, at S7.

¹⁵¹ Two notable exceptions are tower siting issues and public interest obligations. Vice President Gore heads the Advisory Committee on the Public Interest Obligation of Digital Television Broadcasters. The Commission's report regarding digital public interest obligations was submitted to Vice President Gore on December 18, 1998. The Commission is expected to make recommendations to Congress in 1999. See *Panel Ties Digital Must Carry to Public Interest*, BROADCASTING & CABLE TV FAX, Nov. 10, 1998, at 1, 1.

uncomfortable when asked to define a business plan for digital television. Broadcast industry executives, “[t]he people who spend all of their time worrying about . . . this . . . don’t have it all figured out yet.”¹⁵² According to him, this is all right. “[T]here will be lots of digital business plans. . . . [T]here can be multiple visions for digital broadcasting, all of which have merit in the marketplace.”¹⁵³ Commissioners continue to believe that consumers will be best served by the flexibility allowed by the FCC’s order.

The FCC will not be invisible during the transition, but will have limited functions. The FCC will review progress of the transition every two years, beginning in the year 2000. Stations who do not make their deadline to begin digital broadcasting must give frequent progress reports to the Commission.¹⁵⁴ Kennard noted that several issues were already being addressed by various interest groups. The future might see the FCC providing a forum for these industry discussions. “I think that is an appropriate role of government: to bring the parties into the room and try to facilitate compatibility issues.”¹⁵⁵ Beyond that, the FCC feels that its role is “winding down.”¹⁵⁶ According to Commissioner Susan Ness, “[o]ne year ago, the fate of digital television was in the Commission’s hands. Now the torch has been passed back to you, the manufacturers, retailers, broadcasters, and consumers. The success of DTV is largely in your hands.”¹⁵⁷

¹⁵² See West, *supra* note 13, at S8.

¹⁵³ *Id.*, at S8, S9.

¹⁵⁴ *FCC Agrees on DTV Buildout, Not on DTV Obligations and Must-Carry*, *supra* note 2, at 3. The FCC did not decide on penalties for missing the date, and the FCC will “look at every individual case.” *Id.*

¹⁵⁵ West, *supra* note 13, at S8 (quoting Kennard).

¹⁵⁶ David Hatch, *TV Makers Angered by MPAA’s Stance*, *ELECTRONIC MEDIA*, at Nov. 2, 1998 at 6, 30 (quoting Susan Ness).

¹⁵⁷ Commissioner Susan Ness, Remarks at the “DTV in the Desert” Symposium, Consumer Electronics Show, Las Vegas, Nevada (Jan. 9, 1998)(<<http://www.fcc.gov/Speeches/Nessspn801.html>> No longer available on the Internet. Copy on file with Author.) Some lingering concerns remain about the people who will still receive analog signals in 2006. While the 85% penetration extension should alleviate fears, former FCC chairman Redd Hundt said, “if the public likes digital television, it won’t be an issue in 2006. ‘It will be like saying we

G. Consumers

"People are asking, 'What is this about buying a \$7,000 TV set and my current set is going to be no good?'"¹⁵⁸

"Confusion must be minimized - where there is marketplace confusion, there is consumer hesitation."¹⁵⁹

"Between this and Y2K, we've got people already hiding under the bed."¹⁶⁰

Consumers are the most important participants in the digital transition, but also the least understood. At best, consumers can usher in the new technology, demand innovative services and force the analog spectrum to be returned. At worst, consumers can stall a transition that is optimistically expected to take a decade and realistically could be interminable. After trying to separate fact from fiction, and crystal clear pictures from murky predictions, a consumer might be wondering, "what's in it for me?"

One of the few sources of accurate information a consumer has is the FCC webpage. The FCC's list of Frequently Asked Questions ("FAQ") attempts to explain why the agency believed this technology would not only be beneficial, but would be necessary. The FAQ emphasizes the "improved quality of free television service," and the return of the spectrum "for other important uses."¹⁶¹ The FAQ is user-friendly in two ways. It offers a comprehensive look at the digital transition in a clear, concise format. Secondly, it addresses issues that are of particular concern to some consumers, such as tower and zoning regulations. However, this consumer friendly approach may cause a reluctant consumer to wait to make a purchase, or a thrifty consumer to forego a digital set altogether. For example, the FCC truthfully states, "consumers will be able to get many more years of service during the

need to make provisions for people who have Betamax VCR's." Brinkley, *supra* note 4, at D1.

¹⁵⁸ Martin Franks, senior vice president at CBS in Mitchell, *supra* note 54, at 47.

¹⁵⁹ See Ness, *supra* note 157.

¹⁶⁰ Hall, *supra* note 90, at 6 (quoting Bill Naviar, video manager at the Georgia Institute of Technology in Atlanta).

¹⁶¹ *Digital Television Tower Siting Fact Sheet and Frequently Asked Questions*, *supra* note 46.

useful lives of their existing television sets.”¹⁶² The FAQ also educates consumers about the advantages of converter boxes. When discussing how expensive the first digital sets are, and how the price is expected to drop over time, the FAQ advises, “[i]n the meantime (and as a permanent alternative) you will have the option of purchasing a converter box which can be used to adapt your current television for digital use. . . . The price of converter boxes is expected to drop below \$100 during the transition period. . . .”¹⁶³ Additionally, the FCC mentions that the pictures produced by the converters should be clear of ghosts and interference characteristic of analog television. These answers are refreshingly honest. However, these answers will not hasten the advent of digital television.

If CEMA’s research is correct, consumers consider picture quality and cost two of the most important variables when purchasing a TV set.¹⁶⁴ Given that the picture quality of HDTV sets is staggeringly perfect, only the cost element needs damage control. Some worried executives see a quick solution in a lower format. Proponents of TVs capable only of broadcasting 480P digital signals claim that the lower-line format “democratizes” digital TV, because the sets would be a lot cheaper, and presumably accelerate the adoption of digital.¹⁶⁵ Others worry that settling for a lower quality picture right from the outset is a bad idea. “Twenty years from now, will someone look back and say, “Did we give the best a chance, or did we sell out to a more limited system?””¹⁶⁶

In the face of this conflicting advice, the American public has chosen to do nothing. Expectations of digital set sales in the first sales

¹⁶² *Id.*

¹⁶³ *Id.*

¹⁶⁴ See *supra* note 116.

¹⁶⁵ See Mitchell, *supra* note 54, at 52.

¹⁶⁶ *Id.*, at 54. Furthermore, Richard Wiley said elsewhere:

Five years from now, we’ll look back at this and say, “Gee, it’s too bad we had to go through all that but thank God we’re where we are now. Let’s face it, this is a revolution, and it’s going to change video forever in this country, and all for the better. The mere fact that we’ve got some of these problems should not cause us to think that we aren’t going to get there. Because we will.

West, *supra* note 13, at S33.

year, from fall 1998 to fall 1999, were reduced by half.¹⁶⁷ Given that all of the aforementioned industries, in addition to the government, are anticipating eventual acceptance of digital television, it cannot be presented as merely an option if it is to succeed. One can expect to see more attempts to educate a confused public,¹⁶⁸ beyond demonstrations of the pretty pictures. Consumer reluctance may be the greatest inducement to help achieve the lofty goals of “innovation,” and “new and creative opportunities for broadcasters to serve the public interest” set forth in the April 3 Order.¹⁶⁹

VIII. IMMEDIATE OBSTACLES

So far, we have seen several obstacles that the digital participants face. Some, such as a suitable broadcast format, will eventually be solved by inter-industry negotiation and possible government involvement. Others, like public interest obligations, are currently being determined by the government. Consumer confusion will hopefully diminish as the transition continues. There are still other problems with which to contend. The following is an illustrative list.

A. *MUST CARRY*

The largest issue looming on the horizon is the “must carry” debate. In March of 1997, the Supreme Court¹⁷⁰ required cable companies to carry local broadcast analog channels.¹⁷¹ The ruling did not apply to digital broadcasts, and the FCC has begun a notice of inquiry into the subject. The views of the broadcasters and cable executives are, predictably, diametrically opposed. Broadcasters feel

¹⁶⁷ See West, *supra* note 13, at S3.

¹⁶⁸ Most consumers, CEMA research indicates, do not want to know the details of digital. “They don’t want to study this; they want a big red button that says ‘push me’.” Hall, *supra* note 90, at 29 (quoting Mr. Naviar). Digital participants thus have a dual task - to educate consumers about a confusing topic, and do so without intruding on their enjoyment of the product.

¹⁶⁹ Hundt, *supra* note 5.

¹⁷⁰ The Court’s decision can be found in *Turner Broadcasting System, Inc. v. FCC*, 520 U.S. 180, (1997).

¹⁷¹ See Brinkley, *supra* note 4, at D1.

must carry is essential for a successful digital transition.¹⁷² The cable industry insists that must carry is unconstitutional. "We will never agree to any form of digital must carry, and if the FCC acts we will appeal it all the way to the Supreme Court."¹⁷³

FCC Commissioners have hinted at their views, but no one expects a definitive answer "anytime soon."¹⁷⁴ Chairman Kennard was the FCC's general counsel during *Turner*, and believes broadcasters face an uphill battle. "[T]he Supreme Court recognized that the cable industry does have some modicum of First Amendment rights."¹⁷⁵ In his view, broadcasters asking the government to instruct cable to prefer broadcasters over its own editorial selections "is a fairly dramatic request to bring to the government."¹⁷⁶ Susan Ness is "reluctant to mandate carriage of programming that duplicates cable networks."¹⁷⁷ However, she does feel that cable "should be required to pass through broadcast programming in high definition if it is broadcast in that manner."¹⁷⁸ Her mind is "still open on these issues."¹⁷⁹

One reason the issue is so complex is because all digital programming is not the same. Stations may choose to broadcast one high definition program or several standard definition programs at different times of the day.¹⁸⁰ For cable companies, that means that one hour the broadcaster's programming might fill up one cable channel, but could fill two at another hour. Cable operators would be required to continually change their program lineup to accommodate such fluctuations, or allow part of their system to lie fallow.¹⁸¹

¹⁷² The consumers electronics industry sides with the broadcasters. W. Alan McCollough, president of Circuit City Stores Inc., told a congressional subcommittee that "the federally mandated transition timetable would crumble without participation by cable." Joel Brinkley, *Broadcast and Cable Interests Debate Rules for Digital TV*, N.Y. TIMES, Apr. 24, 1998, at D3.

¹⁷³ West, *supra* note 13, at S31 (quoting Anstrom)

¹⁷⁴ Mitchell, *supra* note 54, at 48.

¹⁷⁵ West, *supra* note 13, at S10.

¹⁷⁶ *Id.* at S11.

¹⁷⁷ Ness, *supra* note 157.

¹⁷⁸ *Id.*

¹⁷⁹ *Id.*

¹⁸⁰ See *supra* note 71.

¹⁸¹ See Brinkley, *supra* note 172, at D4.

The FCC is encouraging an industry compromise that could prevent the need for governmental intrusion. Such a compromise would essentially create a pay tier of broadcast digital on cable, creating a revenue stream to be shared by both the cable and broadcast industries. Such an agreement might leave some stations out of the digital loop. "Must carry is not really an issue for the major networks. . . . [T]hey get carriage [M]ust carry . . . is really more of an issue for the independents and the upstart networks."¹⁸² Given cable control of 70% of the nation's TV sets, the must carry issue is critical to the success of the digital transition. One analyst noted, "[w]hatever the government does, if viewers gravitate to the superior HDTV pictures provided by satellite TV services and by the broadcasters, the competition is likely to force cable companies to pump high definition to its customers."¹⁸³ However, as previously noted, without must carry requirements the cable transition to digital can develop at its own pace.¹⁸⁴

All others issue pale in comparison to the must carry debate. Solutions for the following issues, whether government mandated or through industry compromise, could be reached within the next few years.

B. *Spectrum Tax*

¹⁸² West, *supra* note 13, at S10.

¹⁸³ Mitchell, *supra* note 54, at 47.

¹⁸⁴ A recent agreement between Time Warner Cable and CBS may be the first in a series of agreements that could prevent the need for governmental intrusion, either by the FCC or the Supreme Court. In December 1998, the two companies announced that Time Warner's cable systems would carry the digital TV signals from CBS' stations, even if the carriage would require additional channels. The agreement calls for the signal to be transmitted to the viewer "unaltered," so if CBS decides to transmit in SD or HD, the viewer will receive the picture as intended. Other agreements are expected, in an effort to prevent a government mandate that would antagonize the broadcasting and cable industries. Such a mandate is sure to make one industry a clear loser. Decker Anstrom has stated that "the digital carriage agreement between Time Warner Cable and CBS is a clear indication that the marketplace will work and there is no need for government-mandated must carry regulation." Peter J. Brown, *Time Warner/CBS Deal Ushers In New Cable Era*, DIGITAL TELEVISION, 8, 8, (Jan. 1999). See also Lawrie Mifflin, *Time Warner and CBS in Pact on Digital TV*, N.Y. TIMES, Dec. 9, 1998, at C2.

Broadcasters are considering using their digital channels to multichannel.¹⁸⁵ Multichanneling allows the broadcasters to collect a fee for specified services, which may be collectable through a set-top box connection. Present law requires a portion of the fee to be turned over to the government. “Broadcasters get the licenses for free. And the FCC must give them flexibility. But if the broadcasters use the flexibility to make money, other than through advertising, they have to pay a tax.”¹⁸⁶ Multichanneling would allow broadcasters to offer new services such as an all-local-news channel or a local sports channel, to compete with cable. Cable wants the tax, while broadcasters believe it is unfair. They can turn to economists for support. “All economists will tell you, don’t tax innovation. . . . The irony is that if broadcasters merely do the old stuff, just exactly what they’ve been doing, they don’t pay a fee. But if they innovate and are successful and can actually generate more revenue, they get taxed on it.”¹⁸⁷

In late 1998, the FCC adopted a rule requiring 5% of the gross revenues generated by “feeable ancillary or supplementary services” to be paid by broadcasters to the FCC. The fees are to be calculated for the first annual filing cycle, which started on November 19, 1998. Excluded from the FCC’s definition of “ancillary and supplementary services” are video broadcast signals “provided at no direct charge to viewers.” In regards to data that a licensee is paid by a third party to transmit (such as in datacasting), the FCC will decide whether to apply a fee on a case-by-case basis. Remaining issues, including uncertainties as to what services broadcasters may offer and how they fit in the definitions adopted by the FCC, will be explored in early 1999.¹⁸⁸

C. *Compatibility Issues*

There are some technological issues yet to be resolved. The consumer electronics and cable industries informed the FCC in early

¹⁸⁵ See *supra* note 82 and accompanying text.

¹⁸⁶ West, *supra* note 13, at S29.

¹⁸⁷ *Id.*

¹⁸⁸ See Julian L. Shepard, *New Technologies Challenge FCC Rulemakers*, DIGITAL TELEVISION, at 9, 10 (Jan 1999).

November 1998 that they had agreed on a method for digital TV sets and digital cable boxes to communicate.¹⁸⁹ Their optimistic predictions expected cable-compatible digital TV sets to be in stores by late 1999. However, the “firewire” issue may delay the sale of such sets to 2000 or beyond.¹⁹⁰ The physical specifications for the set-top to set connection, known as firewire or the IEEE-1394 standard, is settled. However, the copy protection method has not been agreed upon. Hollywood is concerned about pirating of pay-per-view programming, which will presumably be a greater threat given the clarity of digital broadcasts.¹⁹¹ Some producers and studios have threatened to hold back programming until piracy protections are added to second-generation sets.¹⁹² Inter-industry efforts to resolve the issue are currently underway.¹⁹³

VI. CONCLUSION

These are but a few of the hurdles currently in the path of digital television. Time and again, people involved in the digital revolution have asked for patience and insisted that although the transition will not be smooth, it will happen.¹⁹⁴ Given the enormous hurdles the

¹⁸⁹ See Glen Dickson, *DTV-cable interface accord reached*, BROADCASTING & CABLE, Nov. 9, 1998, at 12, 12.

¹⁹⁰ *Id.*

¹⁹¹ See West, *supra* note 13, at S9.

¹⁹² See Hatch, *supra* note 156, at 6.

¹⁹³ The frontrunner method is a technology developed by Sony, Matsushita, Intel, Hitachi, and Toshiba called 5C Digital Transmission Content Protection (“5C”). Not everyone supports the adoption of 5C, such as Thomson Consumer Electronics and Zenith. Since 5C still has to go through a standard-setting process before being adopted, and manufacturers need about twelve months to put the new silicon chips into their products, equipment with copy protection will probably not make it onto the market by Christmas 1999. In addition, early purchasers have sets without copy protection. When protection technology is implemented, those sets will be unable to receive protected programming. So far, there has been no discussion of retrofitting the first generation sets with the protection technology. See Dickson, *supra* note 189, at 12.

¹⁹⁴ Kennard offered, “The digital television rollout will be complicated . . . [but] the transition to digital TV is inevitable.” Brinkley, *supra* note 132, at C2. Vice President Gore had this to say: “This is the first year of a process of change that will

participants face, these views now seem a trifle too confident. Considering the \$150 billion at stake, they may be right. Even with the difficulties, and the divergent starting points of the industries involved in the digital revolution, steps are being taken to find an area of compromise and avoid additional intrusion by the government. Steps remain to be taken by the consumer electronics industry, and others, to educate the consumer. These steps seem enormous, but remember that it took almost a decade before the April 3rd Order to convince the government that the transition was vital to the American public. The government now expects for the same industries to convince the American public of digital television's potential. While the average consumer has probably not yet been captivated by the stunning digital picture, and the transition has gotten off to a rocky start, the digital industries still have an astonishing product to sell. A little more negotiation and a few more compromises and the sets will start selling. As one analyst noted: "Every nation gets the TV it deserves. And 1990s America, a land replete with both couch potatoes and high-tech capitalists, surely deserves high-definition television. . . ." ¹⁹⁵

take quite some time. It's way too early to tell." Landler, *supra* note 29, at D10. See also Richard Wiley, *supra* note 166.

¹⁹⁵ Krantz, *supra* note 6, at 36.

