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The Father of High-Definition

BY MATHEW INGRAM, WASHINGTON

When Dick Wiley sits down with his friends to watch the Super Bowl tomorrow at his home in Virginia, will he feel a secret sense of satisfaction as he watches the players rush across the 60-inch plasma TV that hangs on his wall and hears the crunch of the quarterback's shoulder as it hits the turf?

He ought to, because without his efforts the big game would look very different indeed.

Mr. Wiley isn't a team owner or a network executive. He's been called "the founding father of the digital and high-definition future" because the decisions he and a small group of engineers and experts made in Washington more than a decade ago revolutionized television as we know it.

This revolution, which has been remaking the living rooms of North America over the past year, is the third major transformation in the history of television, a change comparable to the arrival of colour in 1953 (it took until 1966 in Canada). The ground troops in this revolution are the giant flat-panel LCD and plasma TVs, the inches-thick televisions that have been flying out of Future Shop, Best Buy and other electronics retail outlets.

In the United States, 7.3 million HD-ready TV sets were sold last year, a 63-per-cent jump from 2003. Sales are expected to increase another 50 per cent this year, a wave driven in part by the fact that prices have been cut in half in the past year. In Canada, flat-panel sales are expected to double this year, and double again in 2006.

Part of the appeal is the coolness factor — a sleek, 60-inch display hanging on the wall seems to satisfy a certain futuristic longing. But the high-definition revolution is about more than just size. It means that at some point over the next few years, everyone will need to buy a new television (or at least an HD tuner), whether they want to or not.

In that sense, the move to HD is much like the change to colour, which transformed TV over a period of about 10 years in the 1950s. "I remember the first time I saw colour TV," Mr. Wiley recalled recently. "There was a five-minute program on Channel 5 in Chicago with a guy playing the piano and everybody waited for it to come on because they'd never seen anything like it."

The Father of High-Definition

Mr. Wiley said he always thought high definition would mean a similar revolution.

"It's the first transformation of TV

Football fans who watch tomorrow's Superbowl in unprecedented clarity can thank Dick Wiley, who helped engineer the high-definition process that has transformed television.

in 50 or 60 years," he said. "That's a pretty big deal."

A big deal indeed.

Thanks to the process Mr. Wiley helped engineer (for which he has received a special Emmy award), some Super Bowl fans will not only be watching the game on giant, flat-panel TVs, they will be getting an image that is the equal of that in any movie theatre — better than a DVD. They will also get digital sound that is just as crisp and vibrant.

That kind of realism is a huge draw for sports fans, and the Super Bowl acts like a giant magnet, pulling people into electronics stores. According to some estimates, sales of such sets in the week leading up to the big game account for more than 10 per cent of the year's overall sales of big-screen TVs.

Future Shop merchandise manager Tony Sandhu says the chain is seeing "a 50-per-cent increase [in big-screen sales] this week over three weeks ago in terms of volume," because of the Super Bowl. Although the game was

available in HD last year and in 2003, this year marks the first time that every camera in use at the game will be equipped to broadcast in HD.

In a recent survey, almost as many fans (34 per cent) said having HDTV is as important as good snacks (37 per cent). Some die-hard fans who can't afford a giant plasma display or LCD TV even engage in what you might call "extended product testing," by buying one before the game and then returning it afterward.

Mr. Wiley remembers the first time he had friends over to his house to watch the Super Bowl in high definition. "They were spectacularly impressed by it," he said. "It's really something to see when it comes on." And watching it on a giant screen hanging on the wall is even better.

The former Pentagon lawyer, a tall, lanky 70-year-old with salt-and-pepper hair and bushy eyebrows, liked his 60-inch plasma so much he just had two installed in his firm's new boardroom. They descend from the ceiling at the flick of a switch. Another similar display hangs on the wall in a smaller boardroom.

"I remember saying in 1990 that TVs would one day hang on a wall like a painting," he recalls, with a smile. "I thought it made sense because the older ones took up so much room. The first one I had just ate up my family room. My wife wasn't very happy."

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Whatever they manage to watch them on, the images being enjoyed by fans with HDTV are the result of a process Mr. Wiley — a former chairman of the U.S. Federal Communications Commission — started in 1988, when he was asked to chair the advanced television systems committee, made up of consumer-

electronics companies, broadcasters and other industry players.

What ensued was a kind of technological cage match, in which a half dozen electronic companies, along with research outfits such as the Massachusetts Institute of Technology and Sarnoff Research Center (an offshoot of RCA) threw their best ideas into the ring. Only one emerged at the end.

The ATSC was created because the U.S. government became concerned that the Japanese were getting a head start on the future of television. They had demonstrated full-colour HDTV developed by NHK, whose main interest was in selling more TV sets, and one congressman had said it was "like Sputnik in 1957," the rocket that launched the U.S.-Soviet space race.

The first one I had just ate up my family room. My wife wasn't very happy.

Over lunch in his favourite Italian restaurant, a few blocks from the White House, Mr. Wiley — the picture of Washington establishment in a dark blue pinstripe suit, red tie and light blue shirt — says he wasn't much of a TV fanatic before he joined the ATSC. But when he saw the NHK demo in 1988, he was speechless. The images of geisha girls and flowers on the screen, he says, were so lifelike "it was really amazing."

The ATSC process was supposed to take two years. Instead, Mr. Wiley, a highly regarded lawyer whose firm is now among the top in Washington, wound up spending nine. "We just

wanted to come up with the best technical standard possible," he said. "I thought future generations were going to judge this thing and I didn't want to cut corners on it."

Along the way, companies such as Zenith, General Instrument — whose chairman was U.S. Defence Secretary Donald Rumsfeld — and RCA fought over technologies. The broadcasting industry first embraced HD, then tried to kill it, then later embraced it again, and politicians of all stripes smothered the ATSC with either intrusive suggestions or indifference.

Part of what complicated the process was that the committee had already started work on an analog HD standard when General Instrument said it had developed a digital version, using compression techniques. Mr. Wiley pressed the company to join the testing process because "it was obvious digital was the Holy Grail."

Whether because of his Midwestern candour or his political acumen (or both), Mr. Wiley — who was nicknamed "the sixth commissioner of the FCC" for his legendary connections — managed to ride herd on both the engineers and their various corporate masters, engaging in "shuttle diplomacy, running back and forth with a little yellow legal pad in my hand."

What the ATSC emerged with was a standard that is as much as six times better than regular television. The ATSC definition includes several formats — standard, enhanced and high definition — in order to give broadcasters more flexibility, but the highest resolution carries six times as much information as the older analog television standard, known as NTSC.

The old format, developed in 1941, creates a picture with 480 horizontal

lines, half of which are "painted" every 60th of a second, followed by the other half (a process known as "interlacing"). High definition uses 1,080 lines, and each line also has more pixels, or dots; older TVs had about 345,000, while HDTV sets can display more than two million pixels.

In the end, even arriving at an official standard in 1995, when Mr. Wiley stepped down from the ATSC, didn't settle the issue. It took years of testing and wrangling over different transmission technologies, and a shove from FCC chairman Michael Powell. But Mr. Wiley never gave up hope. "I always thought it was just so much better that it would be sure to catch on."

♦ ♦ ♦

Although the first HDTV set was sold in 1998, the market suffered from a chicken-and-egg problem. There were sets available, but they were too expensive, and because not a lot of people had them, there wasn't much programming available — the same phenomenon that occurred after the arrival of colour.

As recently as 2002, only 200,000 out of the more than 24 million TVs sold in the United States were HD-capable. As more sets have been sold, however, prices have fallen, and broadcasters have started providing more content. "I think 2004 was really a kind of breakthrough year," Mr. Wiley said. "Lots of stuff has come together. It's really nice to see things starting to take off finally."

Giant TVs are still a major purchase, of course, with 40-inch flat-panel LCDs going for about \$9,000 and similar-sized plasmas costing about \$6,000, but prices continue to fall. As more sets are sold, companies produce more, which pushes prices down, in

an echo of the same adoption curve that has brought the price of other products such as DVD players down to virtually zero.

High-definition television doesn't require a 60-inch plasma or LCD display. All a television has to support is 1,080 lines interlaced (1080i) or 720

We just wanted to come up with the best technical standard possible. I thought future generations were going to judge this thing and I didn't want to cut corners on it.

lines progressive (720p, in which the whole image is painted at once). Large screens are popular in part because they are the right format — that is, they are a lot wider than they are high, like the screens in movie theatres.

Both the sales of HD-compatible sets and the amount of HDTV programming have been increasing over the past year, thanks in part to demand but also to a few not-so-gentle nudges from the FCC. In particular, the regulator set out a timetable in 2003 for TV makers and broadcasters to support high-definition programming.

According to the rules, half of all sets with screens 36 inches or larger had to include an HDTV tuner as of last July 1. By this July, all of those sets and half of those with screens from 25 to 35 inches wide must have an HD tuner built in. The four main

The Father of High-Definition

TV networks had to provide at least 50 per cent of their prime-time schedule in high definition as of 2002-2003.

The FCC's original plan was that all broadcasts would be available in HD by 2006, at which time broadcasters would be able to shut off their old NTSC transmitters. Until that time, broadcasters were allowed to "simulcast" both HD and older programs on an extra bit of the spectrum given to them by the regulator.

Industry experts say that deadline may have to be extended, however, since the U.S. rules also require that more than 85 per cent of U.S. households be capable of receiving HDTV programming before the old analog signals can be switched off. According to some estimates, that isn't likely to happen either in Canada or the United States until at least 2010.

The first programs to be displayed in HDTV were sporting events and nature shows, in part because the difference in quality is more dramatic with that kind of programming. But the range of content has broadened over the past year, and now about 70 per cent of U.S. prime-time shows are available in HD.

The picture in Canada is less rosy, since there are no hard and fast rules requiring anyone to do anything. Until recently, CHUM and CTV were the only broadcasters that provided their own over-the-air HD content, although CBC and Global have said they plan to start providing some HD content. Cable and satellite providers broadcast mostly U.S. high-definition programs.

So what happens after everyone has HDTV?

"In 10 years, someone will probably have invented super-HDTV or something like that," Mr. Wiley said. In fact, Japanese engineers are working on something called Ultra High Definition TV, with more than 4,000 lines and six million pixels, while Samsung has shown a prototype plasma display that is 102 inches wide.

For now, the Mr. Wiley believes the "killer app" is the integration of the computer and the television — a process that has already begun, with the arrival of the TiVo and other similar devices that allow TV watchers to customize what and when they watch, and even "stream" their favourite shows to other TVs or save them onto portable media players.

This convergence of the television and the computer is something that software giant Microsoft and computer makers such as Hewlett-Packard have been dreaming about for years — the idea that people could use software or modified computers to look at digital photos, read e-mail or surf the Internet on their TVs.

And what comes after that?

Anything is possible. And whether Mr. Wiley wants to admit it or not, those who create the new future of television will have him to thank.

This article, the first in a six-part series on the new age in television viewing, appeared as the February 5, 2005 front page story of The Globe and Mail. It is reprinted with permission.

GAO

Report to the Ranking Minority
Member, Subcommittee on
Telecommunications and the Internet,
Committee on Energy and Commerce,
House of Representatives

November 2002

TELECOMMUNICATIONS

Additional Federal Efforts Could Help Advance Digital Television Transition



G A O

Accountability * Integrity * Reliability



Highlights of GAO-03-7, a report to the Honorable Edward J. Markey, Ranking Minority Member, Subcommittee on Telecommunications and the Internet, Committee on Energy and Commerce, House of Representatives.

Why GAO Did This Study

The transition to broadcast digital television (DTV) will provide new television services and the improved picture quality of "high definition television." It will also allow some portions of the radiofrequency spectrum used for broadcasting to be returned for public safety and commercial uses. The Congress set December 2006 as the target date for completing the DTV transition and turning off the analog broadcast signals. However, this date can be extended if fewer than 85 percent of households in a market are able to receive the digital signals. GAO was asked to assess issues related to the DTV transition.

What GAO Recommends

GAO recommends that FCC

- explore options to raise public awareness about the DTV transition and its implications,
- examine the costs and benefits of mandating that all new televisions be digital cable-ready, and
- examine the advantages and disadvantages of setting a fixed date for transferring must-carry rights from broadcasters' analog signals to digital signals.

FCC noted actions it has taken and proceedings it has under way to address the intent of these recommendations.

<http://www.gao.gov/cgi-bin/getrpt?GAO-03-7>

To view the full report, including the scope and methodology, click on the link above. For more information, contact Peter Guerrero, (202) 512-3841 or guerrerop@gao.gov.

TELECOMMUNICATIONS

Additional Federal Efforts Could Help Advance Digital Television Transition

What GAO Found

Numerous factors are impeding the progress of the DTV transition, making it unlikely that 85 percent of households will be able to receive DTV signals in many markets by December 2006.

- Few consumers own digital television equipment. Only about 1 percent of television equipment sold in 2001 could receive digital signals. This is largely because digital television sets and tuners are expensive and high definition programming is limited.
- Many consumers are unaware of the DTV transition. In a random household survey conducted for GAO, 40 percent of respondents had never heard about the transition; only one in five were "very aware" of it. In addition, the quality of information that consumers receive about DTV products at the retail level may be inconsistent. In visits to 23 DTV retailers, GAO found that sales staff sometimes provided inaccurate or incomplete information about DTV equipment and programming.
- Cable and satellite digital carriage is limited. The great majority of American households receive their television via cable or satellite. However, cable carriage of local digital broadcast channels is very limited. Furthermore, satellite providers currently do not carry any markets' local digital broadcasts.

To speed the DTV transition, the Federal Communications Commission (FCC) has required that by 2007 most new television sets be capable of receiving digital signals over the air. Another policy option to speed the transition would be to also require that new sets be capable of receiving digital signals via cable. Because many more American households receive television via cable than receive it over the air, mandating that new sets be "digital cable-ready" could effectively speed the transition. However, the cost to consumers of such a policy would first need to be assessed, and outstanding issues related to the compatibility between cable systems and DTV equipment would need to be resolved.

Currently, broadcast stations have the right to require that cable systems in their market carry their analog signals (a right known as "must-carry"). One policy option to facilitate the transition would be to set a fixed date when this must-carry right would transfer from broadcasters' analog signals to digital signals. This option might speed cable carriage of digital broadcasts without requiring cable systems to carry both analog and digital broadcasts simultaneously. Because such a policy could have both advantages and disadvantages, it needs to be carefully evaluated.

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Abbreviations

DMCA	Digital Millennium Copyright Act
DTV	digital television
FCC	Federal Communications Commission
HD	high definition
NCTA	National Cable & Telecommunications Association
ORC	Opinion Research Corporation
POD	point of deployment



GAO

Accountability • Integrity • Reliability

United States General Accounting Office
Washington, DC 20548

1-40

November 8, 2002

The Honorable Edward J. Markey
Ranking Minority Member
Subcommittee on Telecommunications
and the Internet
Committee on Energy and Commerce
House of Representatives

Dear Mr. Markey:

The transition to broadcast digital television (DTV) offers the promise of more programming options, interactive services, and the high-resolution picture quality provided by "high definition television." It also will allow some of the valuable radiofrequency spectrum now used for broadcasting to be made available for other uses.¹ To help realize this transition, the Congress and the Federal Communications Commission (FCC) have established requirements for television stations to broadcast digital signals. In an April 2002 report, we discussed the progress that stations are making in rolling out these digital broadcasts.² Although the provision of digital broadcast signals is progressing, many other things must happen before the transition can be successfully completed. These include the adoption of DTV equipment by consumers, cable carriage of digital broadcast channels, and the availability and provision of digital programming.

As FCC Chairman Michael Powell has noted, at the heart of the DTV transition lies a classic chicken-and-egg problem. Until more consumers have purchased digital television sets, there is little incentive for networks to provide and cable systems to carry more digital programming. Yet without much digital programming available, consumers have little incentive to purchase digital television sets. In April 2002, the Chairman issued a proposal for industry actions to speed the DTV transition. The

¹The radiofrequency spectrum is the part of the natural spectrum of electromagnetic radiation lying between the frequency limits of 9 kilohertz and 300 gigahertz. It is the medium that makes possible wireless communications, including cellular and paging services, radio and television broadcasting, radar, and satellite-based services.

²U.S. General Accounting Office, *Telecommunications: Many Broadcasters Will Not Meet May 2002 Digital Television Deadline*, GAO-02-466 (Washington, D.C.: Apr. 23, 2002).

proposal laid out specific—though voluntary—actions that various industries should take to provide an “immediate spur” to the DTV transition. In addition, in August 2002, FCC established a requirement that by July 2007 most new television sets include a tuner capable of receiving over-the-air digital broadcasts.

The DTV transition began in 1987 when, at the request of many broadcasters, FCC began to investigate issues related to the introduction of advanced technologies for improvements to television picture and sound. This process led to a study of the feasibility of transitioning from the conventional analog broadcasting system to a digital broadcasting system. Since that time, regulatory actions by FCC, in conjunction with direction set out by the Congress in the Telecommunications Act of 1996 and the Balanced Budget Act of 1997, have established the framework and timeline for the DTV transition. During the transition, all television stations in the United States have been provided with a second channel on which to operate a digital broadcast in addition to the channel on which they operate their analog broadcast. Once the transition is complete, broadcast stations will operate solely in digital. FCC set 2006 as the target date for the completion of the DTV transition. The Congress later codified this date but also provided for extending the date under certain conditions. The goal is for broadcasters to cease broadcasting the analog signal by the target date so that some of the radiofrequency spectrum needed for analog broadcasting can be made available for other uses. However, many believe that the transition will not be completed by the target date.

We were asked to assess issues related to the DTV transition, including (1) the benefits and implications of turning off the analog broadcast signals, (2) consumer awareness and adoption of DTV, (3) cable and satellite carriage of digital signals, (4) the availability of digital programming and the role of copy protection concerns, and (5) issues related to DTV tuner mandates.

To meet these objectives, we interviewed representatives of companies in several key industry segments, including broadcasters, television producers, cable and satellite companies, and retailers and manufacturers of DTV equipment. We also had several meetings with FCC staff and various industry trade groups. To better understand consumer knowledge of the DTV transition, we contracted with a survey research firm to conduct a random household survey that asked questions designed to ascertain consumers' level of knowledge about the DTV transition. We also visited a variety of retail stores to obtain anecdotal information on retail

practices in marketing and selling DTV products. A more detailed discussion of our scope and methodology is provided in appendix I.

We performed our review from May 2001 through August 2002 in accordance with generally accepted government auditing standards.

Results in Brief

An important benefit of completing the transition to digital television (DTV) is to recapture portions of the radiofrequency spectrum that are currently used for broadcast television. Some of the valuable spectrum television broadcasters currently use to broadcast analog signals has been reallocated for both public safety needs—such as emergency services—and commercial services. However, under the law, television stations do not have to return their analog channel until 85 percent of households in a market can receive DTV signals; this is not likely to occur by the December 2006 target date in many markets. FCC is still in the process of determining how to interpret the statutory provisions concerning when 85 percent of households can receive DTV. However, even when it has been determined that the 85 percent threshold has been met, questions remain about the impact on the remaining 15 percent of the population, who would not be able to access at least some of their local broadcast channels until they purchased new equipment.

One impediment to the transition is that consumer sales of digital television sets, though increasing, are still relatively small. One barrier to sales is that digital television sets are still expensive compared with analog television sets, but another barrier may be that many Americans have little awareness of the DTV transition and its implications. For example, 40 percent of respondents to a random household survey conducted for us said they had never heard about the DTV transition, and fewer than one in five said they were “very aware” of the transition. In addition, the quality of information that consumers receive about DTV products at the retail level may be inconsistent. During visits to 23 DTV retailers in five states, we found that while much of the information provided by DTV sales staff was correct, many staff were uninformed about important issues, such as the ability to receive DTV over the air and the amount of high definition content currently available. Moreover, few of the screens displayed in the stores allowed customers to actually view a high definition picture. The Chairman of FCC has called upon broadcasters, cable systems, and DTV manufacturers and retailers to do more to market and promote DTV programming and equipment to consumers. However, at this time, FCC does not have significant initiatives of its own under way to raise public

awareness about the DTV transition, apart from information that it provides through its Web site and call center.

Cable and satellite operators are not currently planning to carry significant numbers of local digital broadcast stations, which further hinders the completion of the DTV transition. Because more than two-thirds of Americans receive their television via cable, cable carriage of DTV broadcast signals is important for facilitating the transition. Under one provision in the law, households receiving DTV via cable (but that do not have the equipment to receive DTV over the air) count toward the threshold only if their cable system carries one local DTV broadcast channel from all stations broadcasting such channels in its market. However, because cable systems are reluctant to use scarce channel capacity to carry a broadcast station's digital signal, particularly if it only duplicates what is being shown on the station's analog signal, market forces alone may not result in cable systems carrying all of the local broadcasters' digital signals in a market. Direct broadcast satellite providers, which serve about 17 percent of American television households, are probably even less likely than cable systems to provide all local digital broadcasts; because satellite services are national in scope, these providers face constraints in their ability to carry local broadcasts.

Although broadcasters have the right to demand cable carriage of their analog broadcast channels, FCC has tentatively decided that it would be unconstitutional to require cable systems to carry both analog and digital channels during the transition. However, another option we have identified is to set a "date-certain" when broadcasters would, all at once, switch from having the right to demand carriage of their analog channels to having the right to demand carriage of their digital channels. This policy option could help speed the transition by requiring cable carriage of digital broadcast signals without the need for mandatory dual carriage. Because this option also could have certain disadvantages, it would benefit from further study to determine its viability.

The limited availability of digital programming, possibly due in part to concerns over copy protection, also is slowing the DTV transition. Digital programming, particularly high definition programming, is important both to encourage consumers to purchase digital television sets and to encourage cable companies to carry digital broadcast signals. The amount of digital programming has increased considerably in the past 2 years, but it still represents only a small portion of total television programming. Broadcast networks and cable networks vary greatly in terms of the amount of high definition programming they are providing. The provision

of more digital content is held back by factors that include the small number of viewers with the equipment to watch DTV; the greater cost and complexity of filming or formatting high definition programming; and, possibly, concerns about unauthorized copying and retransmission of digital content provided over the air. In response to this last factor, FCC recently initiated a rulemaking on digital broadcast copy protection issues.

FCC's August 2002 order requiring that most new broadcast television sets include a tuner capable of receiving digital signals over the air raises several issues. This DTV tuner mandate, which is being phased in over 5 years, will speed the transition by increasing the number of households able to receive over-the-air DTV. However, there is some debate about how much this mandate will increase the price of television sets; FCC argues that the economies of large-scale production will keep the added cost of these tuners relatively low. Still, because fewer than one in five Americans actually get their primary television signal over the air, questions have been raised about the economic efficiency of requiring an over-the-air digital tuner in all new television sets. Moreover, although the DTV tuner mandate will help reach the 85 percent threshold, it will do so largely because cable and satellite households that purchase new television sets that include the digital over-the-air tuner will count toward the threshold even though they may not actually watch their television over the air.

One potential option for addressing this issue would be to mandate that, in addition to having an over-the-air tuner, new television sets also should be digital "cable-ready." A digital cable-ready television would likely include a digital cable tuner as well as a security device to handle encrypted cable programming. The marginal cost of mandating digital cable-ready capability has not yet been studied in depth, and other issues regarding the interoperability of cable systems with DTV equipment are still outstanding. However, because far more American households receive television via cable than receive it over the air, mandating digital cable-ready capability could be an effective policy for speeding the DTV transition if the marginal cost of doing so were found to be reasonable and if the outstanding interoperability issues could be settled.

To address the barriers we identified facing the DTV transition, we recommend that the Chairman of FCC (1) explore options that FCC could take to raise awareness among the public about the DTV transition and the implications it will have; (2) direct the relevant FCC bureaus and offices to examine the costs and benefits of mandating that all new televisions be digital cable-ready, and report its recommendations regarding the actions

it believes FCC or the Congress should take; and (3) direct FCC's Media Bureau to examine the advantages and disadvantages of a policy to set a date-certain to switch from full cable carriage of analog signals to full cable carriage of digital signals.

We provided a draft of this report to FCC for comment. FCC said it agreed that raising public awareness about the DTV transition was important, and it noted actions by Chairman Powell and private industry to help achieve this increased awareness. FCC also said it has been engaged in long-standing efforts to achieve compatibility between digital television sets and cable systems and will address this issue in a forthcoming Report and Order. In addition, FCC said that it sought comment on a wide range of options related to digital must-carry, including an option similar to the one described in this report, and that FCC staff are in the process of drafting an order on this issue.

Background

The nation is currently undergoing a transition from analog to digital television broadcasting. Traditional analog broadcasting uses the radiofrequency spectrum to transmit analog signals—that is, signals in which motion pictures and sounds have been converted into a “wave form” electrical signal. With digital technology, the analog wave form is converted into a stream of digits consisting of zeros and ones. For digital television service, like analog service, broadcast stations have been allotted 6 MHz of radiofrequency spectrum for each television channel. However, because digital video signals can be compressed, the spectrum can be used more efficiently, allowing much more information to be broadcast using the same amount of spectrum.

As a result, digital broadcasting provides greater flexibility in terms of the type of television content that can be provided. Most notably, digital broadcasting makes it easier to offer high definition (HD) television. HD television provides roughly twice as many lines of resolution, creating a television picture that is much sharper than traditional analog television pictures. HD television can also provide CD-quality sound and is in “widescreen” format, with display screen ratios similar to a movie theater. With digital broadcasting, 6 MHz of spectrum can be used for at least one channel of HD programming, or it can be subdivided to allow the simultaneous transmission of as many as six separate TV programs of lower quality standard definition television, a concept known as “multicasting.” A broadcast station can also provide “datacasting”—using digital signals to transmit text or data, such as stock quotes or electronic newspapers. “Broadcast stations,” also known as “broadcasters,” are local

operations that transmit signals over the air from the station's transmission tower to the antennas of television sets. Broadcast stations may get their programming content through an affiliation with a "broadcast network" (such as ABC, NBC, or PBS) or a station may be an independent broadcaster. Most stations also produce some of their own content, such as local news programming.

More than four-fifths of American households do not receive their primary television service over the air via their television set's antenna. Instead, they pay a fee to a subscription television service, such as a cable or satellite service. A "cable system" is a company that runs a localized network of cable lines to deliver television signals to subscribers. Some cable systems are individually owned, while others are owned by companies that own and operate more than one cable system. Direct broadcast satellite is a nationally distributed service that transmits programming from orbiting satellites to a customer's satellite dish. Cable systems carry all of their markets' local analog broadcast stations, while satellite services carry local broadcast stations in select markets. "Cable networks" (such as CNN or MTV) produce or acquire television programming that is delivered to cable systems and satellite operators.

Like broadcasters, cable television systems are also transitioning to digital, although they are under no government mandate to do so. Many cable operators have added "digital tiers" to their programming offerings. Satellite systems have always transmitted their signals in digital. Both cable and satellite systems primarily use digital technology as a way of increasing the number of channels they can offer. References in this report to the "DTV transition" refer to the transition by local broadcast stations to the use of digital broadcast signals; it does not refer to the way that cable or satellite systems transmit their signals.

For the DTV transition to be completed, and analog broadcasting to end, two major things need to happen: (1) television stations must broadcast a digital signal and (2) consumers must be able to view that signal. By May 1, 2002, all full-power commercial television stations across America were to have begun airing a DTV signal. As of October 17, 2002, however, only about 43 percent of these stations were broadcasting digitally; the remainder had filed for extensions with FCC. By May 1, 2003, all public broadcast stations also are to be broadcasting a DTV signal.

For a household to see local digital broadcast signals via cable or satellite service, the household must have the necessary equipment, and its cable or satellite service must also carry local digital signals. For consumers to

see the digital signal over the air via an antenna, they must either have a digital-to-analog converter box that will allow them to watch digital signals on their existing analog set, or they must own a digital television set that includes a tuner capable of receiving and processing a digital signal.³ To speed the DTV transition, FCC adopted in August 2002 a requirement that most new television sets must include an over-the-air tuner that receives digital broadcast signals. FCC set various deadlines for manufacturers to include DTV tuners in new television sets, with all sets over 13 inches required to include the tuners by July 1, 2007.

Transition to DTV Will Allow the Return of Valuable Spectrum but Will Require Millions of Americans to Buy New Equipment

One important goal of the DTV transition is to recapture portions of the radiofrequency spectrum currently used for analog broadcasting so this spectrum can be used for public safety needs and auctioned to private companies. Under the law, the spectrum is due to be reclaimed by December 2006, but this date can be extended if less than 85 percent of households in a given market can receive the DTV signal. FCC is still in the process of determining how to interpret the statutory provisions concerning when the 85 percent threshold has been met. Even when 85 percent of households can receive DTV, concerns remain about the impact on the remaining 15 percent of the population, who would not be able to access some or all broadcast channels until they purchased new equipment.

Recapture of Broadcast Spectrum Is an Important Goal of the DTV Transition

An important motivation for completing the DTV transition is to recapture parts of the broadcast spectrum. One goal is to free up portions of the broadcast spectrum that have been reallocated for public safety needs, such as communications by local police and fire departments. The Public Safety Wireless Advisory Committee, in a 1996 report to the FCC, said that an additional 97.5 MHz of spectrum would be needed for public safety communications uses by 2010. In the Balanced Budget Act of 1997, the Congress directed FCC to reallocate 24 MHz of the spectrum to be reclaimed from broadcasters to public safety uses. After the terrorist attacks of September 11, 2001, the Chairman of FCC said that freeing up spectrum for public safety uses has become an even higher priority.

³There are different types of digital tuners, depending on whether the digital signal is being received over the air, via cable service, or via direct broadcast satellite service.

In addition, the vast expansion of wireless technologies in recent years by mobile telephone, broadband Internet, and wireless companies, has greatly increased these industries' demand for portions of the radiofrequency spectrum currently used for television broadcasting. This demand arises not only because of the general scarcity of spectrum, but also because the spectrum used for broadcasting has qualities that make it ideal for the provision of many wireless mobile services.

The Balanced Budget Act of 1997 directed FCC to auction certain portions of the spectrum freed up by the DTV transition according to certain timelines. The Congressional Budget Office has raised concerns that early auction timing could devalue the spectrum because bidders would have to wait years before being able to use the spectrum. The Auction Reform Act of 2002⁴ modified the statutory deadlines set by the Balanced Budget Act and gave FCC increased flexibility in determining when to complete auctions for the remainder of the spectrum.⁵ The Auction Reform Act noted that delay in the return of portions of the spectrum used for broadcasting reduces both the amount of money that auctions are likely to produce and the probability that the spectrum will be purchased by the entities that will put it to its most productive use.

Date When DTV Transition Will Be Completed and Spectrum Returned Is Uncertain

FCC established 2006 as the target date for completing the DTV transition, and this was later codified by Congress in the Balanced Budget Act of 1997. By December 31, 2006, the goal is for broadcasters no longer to broadcast the analog television signal, and for the spectrum that they vacate to be returned so that it can be made fully available for other uses. However, because the Congress was concerned about leaving substantial numbers of households without the ability to access broadcast television signals, the law specifically provided for extensions in certain circumstances. Under the statute, FCC must grant extensions to requesting stations in a television market where it finds that one of the following three conditions exists:

⁴P.L. 107-195, 116 Stat. 715 (2002).

⁵Various proposals have been made that broadcasters pay a fee for their use of the broadcasting spectrum until they return their analog channels. Although such a policy may have its advantages and disadvantages, it is unclear what its impact would be on the DTV transition. More than likely, all broadcast stations will be transmitting a digital signal by 2006, and most of the other factors affecting the transition—such as cable carriage and consumer adoption of DTV equipment—are largely outside of the broadcast industry's control.

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1. at least one television station affiliated with the four largest national networks (ABC, CBS, Fox, or NBC) is not broadcasting a DTV signal;
 2. the technology to convert a digital signal for use on an analog television set is not generally available; or
 3. fewer than 85 percent of television households in the television market has the ability to receive DTV—a television household would not count as receiving DTV if it (a) did not subscribe to a “multichannel video programming distributor” (such as a cable or satellite service) that carries a digital broadcast channel from each broadcaster in that market and (b) did not have a television receiver or a digital-to-analog converter capable of receiving digital broadcast signals.⁶

How FCC interprets the third provision—sometimes referred to as the “85 percent rule”—has important implications for when the broadcast spectrum can be returned. Several aspects of this provision are still to be determined. For example:

⁶The Balanced Budget Act of 1997 amended the Communications Act of 1934 by adding Section 309(j)(14), which provides:

“(14) AUCTION OF RECAPTURED BROADCAST TELEVISION SPECTRUM. —

“(A) LIMITATIONS ON TERMS OF TERRESTRIAL TELEVISION BROADCAST LICENSES—A television broadcast license that authorizes analog television service may not be renewed to authorize such service for a period that extends beyond December 31, 2006.

“(B) EXTENSION—The Commission shall extend the date described in subparagraph (A) for any station that requests such extension in any television market if the Commission finds that—

“(i) one or more of the stations in such market that are licensed to or affiliated with one of the four largest national television networks are not broadcasting a digital television service signal, and the Commission finds that each such station has exercised due diligence and satisfies the conditions for an extension of the Commission’s applicable construction deadlines for digital television service in that market;

“(ii) digital-to-analog converter technology is not generally available in such market; or

“(iii) in any market in which an extension is not available under clause (i) or (ii), 15 percent or more of the television households in such market—

“(I) do not subscribe to a multichannel video programming distributor (as defined in section 602) that carries one of the digital television service programming channels of each of the television stations broadcasting such a channel in such market; and

“(II) do not have either—

“(a) at least one television receiver capable of receiving the digital television service signals of the television stations licensed in such market; or

“(b) at least one television receiver of analog television signals equipped with digital-to-analog converter technology capable of receiving the digital television service signals of the television stations licensed in such market.”

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- Defining a "market": It has not yet been established what constitutes a television market under the statute. FCC officials told us that they have not yet determined what market definition to use, and that this would likely be established in a formal proceeding.
 - Counting cable subscribers: For a household to count as receiving DTV via cable, its cable service must carry at least one digital programming channel from each broadcaster in its market. But it is not yet clear whether a household subscribing to such a service counts if it does not have the equipment necessary to actually view that programming (i.e., it does not have a digital television set or set-top converter box).
 - Method of measurement: It is not yet clear what method would be used to actually measure how many households in a market can receive DTV signals. Some information may be available from cable and satellite providers, but it is uncertain how FCC will determine how many households in a market have the equipment to receive DTV over the air.

In a January 2001 notice of proposed rulemaking that focused on cable carriage of DTV signals, FCC included a section seeking comment on how to count DTV households for the purpose of reaching the 85 percent threshold.⁷ FCC has not yet issued a ruling on this notice, and FCC officials told us that few of the comments received touched on the 85 percent rule. The officials also noted that because DTV penetration is still very low, clarifying the 85 percent rule does not need to be addressed immediately. We asked FCC in a letter for its interpretation of the statute regarding how cable subscribers will count. In a return letter, FCC said that it has not yet adopted a definitive interpretation of that provision of the statute, but that it may initiate a proceeding in the near future that focuses on soliciting public comment on the issue.⁸

The first and second provisions of the statute cited above—that major network affiliates broadcast the digital signal and that technology be available to allow the signal to be converted for use on an analog television set—are not likely to be an obstacle to the transition. However, there was a consensus among most industry experts we spoke with that the third provision—the 85 percent rule—will probably not be met in most

⁷*In the Matter of Carriage of Digital Television Broadcast Signals*, CS Docket No. 98-120, *First Report and Order and Further Notice of Proposed Rulemaking*, FCC 01-22 (released Jan. 23, 2001) at paragraph 117.

⁸Letter from W. Kenneth Ferree, Media Bureau Chief, FCC, to Alan Belkin, Assistant General Counsel, U.S. General Accounting Office (Aug. 5, 2002).

markets by 2006. To reach 85 percent penetration of DTV signals, a series of interrelated changes need to occur, many of which are largely driven by the market. These changes include the availability of more digital programming, increased carriage of digital signals by cable companies, and increased consumer purchases of DTV receivers or converter boxes. As discussed throughout this report, serious roadblocks still remain to achieving each of these changes.

**DTV Transition Will
Require Millions of
American Households to
Buy Additional Equipment
to Continue to Access
Broadcast Stations**

The DTV transition will impose some cost, either directly or indirectly, on all television viewers. To be able to receive DTV signals, a household must take one of several actions. It either must (1) purchase a television set that includes a tuner capable of receiving digital broadcast signals, (2) purchase a converter box that captures the digital broadcast signal and converts it to a format that can be shown on an analog television set, or (3) subscribe to a cable or satellite provider that is carrying the broadcast stations' digital signals as well as have the equipment necessary to receive that provider's digital signals.⁹ All of these options involve some financial cost related to DTV equipment—and digital television sets and tuners are currently relatively expensive. Although the price of these technologies is expected to drop dramatically as more units are produced, the cost still may be a burden to many households, particularly low-income households.

Once the 85 percent threshold has been met in a market and the analog signals are turned off, the remaining 15 percent of households will no longer be able to receive some or all broadcast channels. Households that were receiving their television solely over the air, and had not yet purchased a digital television set or converter box, would lose all television service. These households would need to purchase a new television set or converter box to resume their access to broadcast television. Households that were subscribing to cable or satellite would, depending on their circumstances, need to get the necessary equipment to view their cable or satellite services' digital signals or purchase an over-the-air digital tuner (if they did not have one already) to continue to receive the local broadcast channels not being provided by their cable or satellite service. Nationwide, 15 percent of American television households represents nearly 16 million households, consisting of about

⁹This assumes that cable providers do not downgrade the broadcasters' digital signals to analog before transmitting them to subscribers. If this were done, cable subscribers would not need new equipment but would also not receive most of the benefits of DTV, such as high definition.

40 million people, who would lose access to at least some of their local broadcast channels until they purchased additional equipment.

In addition, many households that are able to receive all DTV signals via their cable system will still face some loss of television service. Many households that have cable or satellite service also have one or more additional television sets that are not hooked up to this service. Any such sets that do not contain an over-the-air digital tuner will no longer function without the purchase and installation of a set-top converter box once analog service ends. Overall, approximately 81 million television sets in 42 million American homes currently receive their television signal solely over the air, according to Consumer Electronics Association estimates.

Policy-makers will likely find it unpalatable to disenfranchise a large number of American households from the ability to receive broadcast television signals. The importance that many Americans attach to having television access was illustrated a few years ago in a series of lawsuits involving several broadcasters and a satellite video distribution company named PrimeTime 24.¹⁰ As a result of court rulings, the satellite distributor was ordered to stop providing certain broadcast signals to about 2 million satellite subscribers. This potential loss of service engendered an enormous amount of correspondence from affected satellite subscribers to Members of Congress, resulting in considerable pressure for a solution before the signals were to be shut off. The PrimeTime 24 case is not a perfect analogy to the DTV transition: that case had the potential to completely turn off certain television signals to certain consumers, whereas at the completion of the DTV transition, households can choose to maintain their television service by purchasing additional equipment. But the PrimeTime 24 case does serve to illustrate how the public may react to any disruption in their television service. As with the PrimeTime 24 case, political pressure will likely develop among those American

¹⁰Several broadcast television stations sued a satellite video distributor for copyright infringement for providing certain broadcast signals to some households. Specifically, broadcasters charged that PrimeTime 24 was illegally providing broadcast signals from "distant" markets to viewers who were close enough to the local broadcast towers in their own markets to adequately receive the stations' signal through an over-the-air antenna. Two courts ruled against PrimeTime 24 and required that it cease distribution of distant station signals to about 2 million households. The case was ultimately resolved when the Congress passed the Satellite Home Viewer Improvement Act of 1999, which allowed (1) direct broadcast satellite providers to include local broadcast signals as part of their programming packages and (2) some of the households specifically affected by the PrimeTime 24 case to continue receiving distant broadcast signals.

households faced with an impending loss of television service due to termination of the analog signals.

Many other countries also are wrestling with how to complete their DTV transition without stranding substantial numbers of consumers who have not yet adopted DTV equipment when the analog signals are shut off. For example:

- The government of the United Kingdom has said that its broadcasters will turn off the analog signals when at least 95 percent of households can receive the digital signals. In addition, United Kingdom officials have noted that their decision about a turn-off date will also factor in the affordability of DTV equipment.¹¹
- The Canadian government's recent policy statement on DTV states that "consumers will be able to upgrade their equipment at their own pace and convenience" and that the transition will be "market-driven." Canadian officials told us that industry interests opposed any strict deadlines for turning off analog signals.
- In setting the date for turning off analog signals, the Japanese government factored in the average life cycle of a television set in Japan (8 years) and the expected cost of digital television sets after the economies of mass production are realized. On the basis of that analysis, government officials told us that consumer adoption of digital television sets will be sufficient to turn off the analog signals without serious adverse effect to consumers by 2011.

¹¹Officials told us that converter boxes that convert broadcasters' digital signals to analog for display on a traditional television set are currently selling for about the equivalent of \$150. The DTV transition in the United Kingdom generally involves less expensive equipment than in the United States because the transition in the United Kingdom is to a digital, but not high definition, platform.

Consumer Adoption of DTV Has Been Slow, Partly Because Many Americans Are Unaware of the Transition and Are Not Well Informed about DTV Products

In a telephone survey of 1,000 randomly selected American households, we found that many people have little understanding of the DTV transition and its implications. In addition, consumer electronics sales data suggest that consumers have not been purchasing digital television sets at a pace rapid enough to make it likely that 85 percent market penetration will be reached by the end of 2006. When we posed as consumers during visits to 23 DTV retailers, we found that much of the information provided by sales staff about DTV equipment was correct. However, many staff were uninformed about important issues and few of the screen displays in the stores allowed consumers to actually view a high definition picture.

Knowledge about the DTV Transition Is Limited

More than 98 percent of American homes have a television set and the average number of televisions per home is 2.5. Moreover, television has become an important part of American life; it is how we share news, entertainment, and public safety information. In addition, the Congress has repeatedly noted the importance of maintaining the nation's free, over-the-air system of local broadcasting, which provides local news and community programming.

The DTV transition will greatly change how television is received in the United States; every household will need to make choices about what type of equipment or service to purchase to continue to receive television programming. However, it appears that relatively few Americans are familiar with the DTV transition and what it entails. To gauge consumer understanding of the DTV transition, we contracted with a survey research firm to conduct a telephone survey of 1,000 randomly selected American households. The consumers were asked questions that were designed to ascertain their level of familiarity with and knowledge about the DTV transition.

Overall, we found that many people have a low level of understanding of the DTV transition and its implications. For example:

- Forty percent of respondents said they had never heard about the transition to digital broadcast television, and another 43 percent said they were only "somewhat aware" of the transition. Fewer than one in five said they were "very aware."

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- Nearly half of respondents said they were not familiar at all with the difference between an analog television set and a digital, high definition television set. Only 14 percent were "very familiar" with the difference between the two products.¹²
 - Sixty-eight percent of respondents did not know that most television sets currently in use will require a converter box to continue to receive over-the-air broadcasts when the transition is complete.

We also found some differences in the characteristics of people who were more likely to know about the transition versus those who were less likely to know. For example, we found that men were considerably more likely to know about the transition than women, and those who were college-educated were more knowledgeable than those without advanced education. Also, we found some evidence that respondents who received television over the air were less likely than cable or satellite subscribers to know about the transition to DTV. (See app. III for more detailed information about the survey results.)

This lack of familiarity about the DTV transition among American consumers could be problematic. If consumers are unfamiliar with DTV—particularly with benefits such as high definition television—they are less likely to purchase digital television sets. Yet, if few consumers purchase digital television sets, producers have little incentive to provide much digital content and cable systems have little incentive to carry the digital signal. Thus, consumer awareness of the transition—and subsequent consumer adoption of DTV equipment—is a key element in facilitating the transition.

Chairman Powell's April 2002 proposal for voluntary industry actions to speed the DTV transition suggested several actions that sought to increase consumer awareness. The Chairman called on broadcast stations to use their analog channel to promote the content on their digital channel. He also called on cable systems to market their DTV products and programming on the air and in customers' monthly bills. In addition, he asked DTV equipment manufacturers and retailers to market broadcast,

¹²It is possible that respondents overreported their familiarity with the difference between analog and digital television sets. For example, we also asked respondents whether they currently own a digital, high definition television set. Nine percent said they did, even though the Consumer Electronics Association estimates that only 1 percent of households owned such a set at the time the survey was conducted. Consumers may be confusing a digital television service (such as digital cable or satellite) with a digital television set.

cable, and satellite DTV options to consumers at the point-of-sale. In response to this proposal, the 10 largest cable operators said they would do more to advertise and market their value-added DTV programming, and consumer electronics makers said they would use point-of-sale promotions and a national public awareness campaign to promote DTV set-top boxes. In addition, in January 2002, the broadcast and consumer electronics industries formed a joint initiative to increase awareness and understanding of DTV through promotional activities in select cities.

FCC itself has not undertaken any significant activities to raise public awareness about the DTV transition and its implications. An FCC official told us that the agency provides information about DTV in several places on its Web site and through the call center of its Consumer & Governmental Affairs Bureau. However, although the Powell plan addresses actions that industry should take, FCC has no specific initiatives of its own under way regarding public education on DTV or the transition. FCC officials told us that the bulk of consumer education that is related to DTV will likely be provided by the private sector, such as through advertisements and point-of-sale discussions, rather than by the government. However, because DTV sales and programming are still relatively limited, consumer electronics makers and other industries may not have sufficient market incentives to provide a high-profile DTV marketing campaign in the short term. Because the public will accrue some of the benefits from recovering portions of the broadcast spectrum, a publicly funded information campaign may be justified if it would hasten the end of the DTV transition.

Quality of Information That DTV Retailers Provide to Consumers Varies

Although sales of digital television sets have been increasing steadily, the overall level of adoption remains low. Sales have grown from approximately 14,000 units in 1998 to approximately 1.5 million units in 2001, according to the Consumer Electronics Association.¹³ However, despite this sales growth, in 2001 digital television units still represented less than 5 percent of the 28 million television sets sold in the United States. Moreover, the majority of these units were DTV monitors, which lacked a DTV tuner that can receive DTV signals. Sales of television sets

¹³Digital television "units" include digital television monitors, integrated digital television sets (monitors that also include a digital tuner), and stand-alone set-top boxes that serve as digital tuners. Sales figures cited here represent factory-to-dealer sales, rather than sales to consumers. Because they include products still in inventory in retail stores, actual consumer sales may be lower.

that included a tuner capable of receiving digital broadcast signals, when combined with sales of set-top DTV tuners, still represented less than 1 percent of all television sets sold. Sales of digital television sets with DTV tuners will increase due to FCC's recent requirement that all new sets include a DTV tuner, but this requirement is being phased in, with virtually all new televisions to have a DTV tuner by 2007.

There also are roughly an additional 250 million existing television sets in the United States, nearly all of them analog. Because the average life span of a television set is about 10 years, large numbers of households will have analog television sets for the foreseeable future. As a result, even the DTV tuner mandate—which affects only new television sets—is unlikely to result in 85 percent DTV market penetration by the end of 2006, or several years thereafter.

Perhaps the most significant barrier to greater consumer adoption of DTV equipment is its cost. In 2001, the average price of a digital television set was more than \$1,800. Still, digital television set prices have steadily dropped in the past few years. Whereas the average price for a digital television set was more than \$3,000 in 1998, by mid-2002 some units were available for as little as \$1,000, according to the Consumer Electronics Association.

Many analysts believe that many more consumers would be willing to purchase DTV equipment if they were more familiar with DTV and had more exposure to high definition television's picture and sound. For many consumers, retail sales outlets provide the best opportunity for viewing and learning about DTV products. To gather anecdotal information on consumers' experiences at DTV retail outlets, we visited 23 consumer electronics stores in California, Maryland, Massachusetts, Nevada, and Virginia. We visited each store as a consumer "shopping" for DTV products and asked several standard questions to a member of the store's sales staff.

The accuracy of the information provided by the sales staff with whom we spoke was mixed. Nearly all of the staff were correctly able to explain the "platforms" available for receiving digital and HD channels (i.e., over the air, cable, and satellite). They also were generally accurate in explaining what equipment would be needed to receive digital signals. In addition, most staff had some knowledge about which channels and programs were available in high definition.

However, there was also a fair amount of inaccurate information provided. Overall, 18 of the 23 sales staff provided inaccurate information about at least one significant aspect regarding DTV. For example:

- Eight of the 23 sales staff significantly overstated the amount of HD content currently available. For instance, 1 said that all cable channels are in HD; a few incorrectly said that Fox and WB were currently broadcasting in HD.
- Four of the staff incorrectly said local broadcasters in their market were not broadcasting a digital signal.
- Four of the staff told us DTV is not available over the air at all. Other staff misstated what equipment would be needed to receive DTV over the air.

In addition, we noted that the majority of stores we visited were not showing an actual high definition picture on the high definition television sets being displayed on the showroom floor. Instead, many stores showed prerecorded movies or non-HD satellite programming. Sales of DTV products may be slowed because many consumers have never actually experienced true high definition television, with its superior audio and video qualities.

In addition to visiting individual retail stores, we also interviewed executives at the corporate offices of four major retailers of DTV products. They acknowledged that there is a lot of confusion among consumers about DTV equipment due to the complexities involved. Because digital television sets represent a tremendous growth opportunity for consumer electronics retailers, they said they are eager to ensure that their stores provide consumers with exposure to DTV, including high definition, and that their sales staff are highly knowledgeable about DTV products. Some companies told us that they provide their floor staff with specialized training on DTV, and that they are using innovative methods, such as on-line training tools, to do so.

Carriage of Digital Signals by Cable and Satellite Operators Is Insufficient to Help Achieve 85 Percent Threshold Quickly

On the basis of current plans for digital carriage by cable and satellite companies, it appears unlikely that many households will have access to all of their local digital channels via cable or satellite by December 2006. FCC has tentatively decided against mandating that cable systems carry analog and digital channels simultaneously during the transition. In lieu of dual carriage, however, another option we have identified is to set a "date-certain" when cable systems would, all at once, switch from carrying analog channels to carrying digital channels.

Cable Carriage of Digital Signals Is Limited

Because more than two-thirds of Americans receive their primary television service via cable, cable carriage of digital broadcast signals is an important element in encouraging consumer adoption of digital television sets and in encouraging producers, networks, and broadcasters to provide more original digital and HD programming. Without carriage of the digital broadcast signals by their carrier, cable customers—even those who own digital television sets—are unable to watch via cable the digital channel provided by most local broadcast stations in large cities.¹⁴ Presently, for a cable customer to watch local digital broadcast stations in digital format over a cable system, several factors must be in place: that customer must (1) own a DTV monitor; (2) live in a market with stations that are broadcasting digitally; (3) subscribe to a cable system that has chosen to carry those local digital broadcast signals; and (4) get from the cable system a special set-top box and the necessary cable subscription package needed to view HDTV.¹⁵

Currently, most cable companies do not offer their customers local digital broadcast signals. As of August 2002, only 3 of the 10 largest cable companies—Time Warner, Comcast, and Cox, which together serve more than 25 million cable customers—carried local digital broadcast stations in some of their markets. In his April 2002 proposal for voluntary industry action, the FCC Chairman called on cable systems with at least 750 MHz channel capacity to carry up to five channels that provide substantial HD

¹⁴Cable customers with digital television sets and a digital tuner can still receive DTV signals over the air. However, few consumers have such a tuner, and those who do must switch back and forth between cable and antenna reception to receive local digital broadcasts.

¹⁵Cable systems offer different subscription packages or "tiers." The basic tier typically consists, at a minimum, of local analog broadcast signals, while an expanded tier includes additional cable network channels. In the past several years, cable systems have been offering a "digital cable" tier, which can have 100 or more channels.

programming or other value-added digital programming during at least 50 percent of their prime-time schedule by January 1, 2003. The nation's top 10 cable companies have all agreed to do so in the top 100 markets. However, these five channels may include a mix of both local digital broadcast channels and national cable networks that provide HD programming. As a result, it is unclear how much cable carriage there will be of digital local broadcast channels in the near future. These companies also have agreed to provide consumers who request them with set-top boxes that include digital inputs and can display HD.

We spoke with representatives from 5 large companies that own multiple cable systems and 10 broadcast stations, and we reviewed comments submitted by the cable industry in FCC proceedings. We asked the representatives about the incentives and disincentives that cable systems face in choosing to carry local digital broadcast channels as well as to carry high definition channels provided by national cable networks. Cable companies said they are willing in some cases to carry local digital broadcast stations, but they are reluctant to use their limited channel capacity to provide a local digital signal that (1) very few consumers are able to watch and (2) often merely duplicates what appears on the broadcaster's analog channel. The cable companies said they are far more likely to carry a station's digital signal if it offers "compelling" content that is in demand by their customers. In particular, they said they are most interested in carrying digital channels that offer substantial amounts of high definition programming, as opposed to standard definition digital or multicasting.

Cable companies also told us that their most important incentive for providing more digital carriage is competition with direct broadcast satellite. Satellite service has rapidly increased its market share: it grew from about 7 percent of television households in 1999 to more than 17 percent by mid-2002. The two major national satellite companies generally do not provide local digital broadcast channels, but they do offer their customers several high definition cable networks, such as HBO HD and Discovery HD Theater. Cable companies told us that they want to increase the amount of digital programming they offer—including local digital broadcasts—to stay competitive with satellite.

Some cable systems would have great difficulty carrying digital signals even if they wanted to do so. Many smaller cable systems have not installed fiber optic cable lines or made other upgrades to their cable network that allow for the carriage of digital signals. As a result, these

systems are highly limited in their channel capacity and are unable to carry local digital broadcast channels in a digital format.

Cable Carriage Is Unlikely to Be Sufficient to Help Reach the 85 Percent Threshold by December 2006

As previously discussed, the analog broadcast signals are not likely to be turned off after December 2006 unless 85 percent of households in a given market can receive DTV. More than two-thirds of American households subscribe to cable television, and thus cable carriage of DTV signals may play a large role in determining when that 85 percent threshold has been reached. The law says that households receiving DTV via cable count toward the 85 percent threshold only when their cable system carries a digital broadcast channel from all stations broadcasting digitally in their television market. Yet, while most large cable companies are planning to provide a digital broadcast channels from some broadcast stations in many markets, none currently plan to carry a digital broadcast channel from all digital broadcast stations. As a result, it appears highly unlikely that cable carriage of local digital broadcast signals will be sufficient to substantially contribute to reaching an 85 percent market penetration by 2006. To some extent, this problem is mitigated by FCC's recent DTV tuner mandate. In the future, as cable customers purchase new television sets that contain a DTV tuner, they will be able to receive digital signals over the air even if their cable system is not carrying those signals. However, this will require some cable households to take actions that many are resistant to: install a rooftop or set-top antenna and switch back and forth between cable service and over-the-air reception to access local digital channels not carried on their cable system.

Direct Broadcast Satellite Providers Offer No Local Digital Channels

As of mid-2002, about 17 percent of American television households subscribed to direct broadcast satellite service, and subscribership has been increasing rapidly in recent years.¹⁶ The two primary satellite television services available in the United States are DirecTV and EchoStar's DISH Network. All satellite subscribers need a satellite dish and a satellite receiver, but subscribers who want to access HD programming via their service are given a special dish and receiver that can process HD signals.

¹⁶Companies that provide television delivery for a fee (as opposed to free, over-the-air television) are known as "multichannel video programming distributors." In addition to cable and direct broadcast satellite, which are by far the most common, these distributors include multichannel multipoint distribution systems (wireless cable), local multipoint distribution systems, satellite master antenna television, and open video systems.

DirecTV and DISH each offers subscribers the option of receiving their local analog broadcast channels in about 45 television markets. However, neither service offers any local digital broadcast channels in any market.¹⁷ Both satellite providers do, however, offer several options for HD programming from cable or satellite networks. For example, both providers offer HBO HD and Showtime HD, while DirecTV also offers HDNet, and DISH also offers Discovery HD Theater.

Because satellite is a national service, it faces inherent constraints in providing local broadcast channels: carrying a local channel in a few markets uses the same channel capacity as carrying one cable network to customers nationwide. Representatives of the two satellite services have said it is therefore not feasible for them to carry local digital channels and analog channels at the same time on a widespread scale. Lack of local digital carriage during the transition by satellite providers may increase the difficulty of reaching the necessary 85 percent DTV penetration threshold in many markets, particularly if satellite service continues to grow in market share.

This problem is somewhat mitigated by the fact that satellite equipment can be adapted fairly easily to have the additional capability of receiving local digital channels through an over-the-air antenna. DISH already offers subscribers equipment that serves the dual purpose of receiving and decoding both satellite signals (which can include HD) and over-the-air broadcast signals (which can include both analog and digital). The over-the-air antenna automatically picks up the signal when the television is tuned to a local broadcast channel, and the satellite dish picks up the signal when the television is tuned to other channels.

FCC Has Tentatively Decided Against Mandatory Dual Cable Carriage

Under the Cable Television Consumer Protection and Competition Act of 1992, local commercial broadcast stations have the right to require that cable systems in their market carry their analog signal. Once the DTV transition is complete, and analog broadcasting ends, this right, commonly known as "must-carry," will transfer to broadcasters' digital signals. Most stations, including the great majority of those affiliated with a major broadcasting network, do not need to invoke "must-carry" because cable

¹⁷DISH allows subscribers under certain circumstances to access the digital signal of CBS's New York or Los Angeles affiliate. However, this option is not available to subscribers in the New York or Los Angeles markets, and thus no DISH subscribers receive local digital broadcasts in their own market location.

systems desire to carry them. These stations sign what is called a "retransmission consent agreement" with the cable system, which lays out the terms under which the cable system will carry the station.

Currently, these must-carry rules apply only to broadcasters' analog channels.¹⁸ In July 1998, FCC initiated a proceeding on DTV cable carriage, which included a discussion of whether must-carry rules should be modified so that they apply both to a station's analog channel and its digital channel during the DTV transition.^{19,20} In the proceeding, broadcasters argued that few cable systems currently offer local digital broadcast channels, which means that cable customers have little incentive to purchase digital television sets. With few viewers owning digital television sets, networks have little incentive to provide more value-added digital programming, such as HDTV. This completes a circle: with few consumers owning digital television sets, and little digital programming available, few cable systems have any incentive to carry local digital signals. Broadcasters have argued that mandating cable carriage of both analog signals and digital signals, often known as "dual must-carry," would break this circle and greatly improve the speed with which 85 percent DTV market penetration is reached.

The cable industry has strongly opposed a dual must-carry requirement, arguing that it would greatly limit the number of channels that cable providers are able to offer their customers. The industry contends that the DTV transition has been slow largely because broadcasters have failed to provide enough original digital and HD programming; it also says that cable systems will carry local digital broadcasts as soon as consumer demand warrants it. In addition, the industry argues that dual must-carry would represent a violation of its free speech rights and an unlawful "taking" of its property.

¹⁸During the DTV transition, a station may invoke must-carry for its digital signal only if that station has no analog signal and broadcasts only a digital signal.

¹⁹*Notice of Proposed Rule Making on Carriage of Transmissions of Digital Television Broadcast Stations*, CS Docket No. 98-120, released July 10, 1998.

²⁰Direct broadcast satellite companies have a requirement somewhat analogous to cable's must-carry. The Satellite Home Viewer Improvement Act of 1999 (P.L. 106-113) allows direct broadcast satellite companies to provide local broadcast signals, but requires in most circumstances that if they carry any local channels in a market, they are required to carry all of that market's channels.

In January 2001, FCC tentatively decided that it would be unconstitutional to require dual must-carry. FCC concluded that requiring simultaneous carriage of both analog and digital broadcast signals appeared to burden cable operators' First Amendment interests more than was necessary to further a substantial government interest. FCC also issued a Further Notice of Proposed Rulemaking to collect public comment and gather more information before a final ruling is made on the issue.²¹

**Setting a Date-Certain for
Cable Switchover from
Analog to Digital Carriage
Might Be a Way to
Facilitate DTV Transition**

Under the current legal and regulatory environment, it may be a long time before cable carriage of broadcast DTV signals is sufficient to help substantially contribute to the 85 percent threshold. Market forces are unlikely to engender full dual carriage because cable systems do not want to use scarce channel capacity to simultaneously carry two channels of each broadcast station. At the same time, cable systems have little incentive to switch from solely analog to solely digital carriage of local broadcast stations until the end of the transition. The resulting situation is something of a "catch-22." Once the transition is completed, and the analog signals are turned off, all cable systems will be carrying local broadcasters' digital signals. However, it is likely that the transition will not be completed until 85 percent of households in a market can receive those digital signals. Yet, because cable systems are generally unwilling to carry the analog and digital signals simultaneously, it is more difficult to reach that 85 percent threshold in the first place.

Rather than wait for cable systems to carry all local broadcast digital signals through voluntary dual carriage, one option we have identified is for FCC to adopt rules under which a specific date is set for cable systems to switch from full carriage of analog signals to full carriage of digital signals. Imposing a date-certain for a cable carriage switchover from analog to digital signals could have two specific advantages. First, it could facilitate the transition by requiring cable carriage of digital broadcast signals—and would do so without the need for dual carriage. Second, cable systems and their customers would know a date-certain for which they could plan to be ready for the switchover and have the necessary equipment in place.

²¹*In the Matter of Carriage of Digital Television Broadcast Signals*, CS Docket No. 98-120, *First Report and Order and Further Notice of Proposed Rulemaking*, FCC 01-22, released Jan. 23, 2001.

Procedurally, this policy might best be carried out by setting a date when broadcast stations' right to invoke must-carry for their stations' signal would transfer from their analog signal to their digital signal. Because cable systems and broadcast stations routinely renegotiate carriage agreements every 3 years, a logical time frame for implementing this switchover would be when these agreements are set to be renegotiated. Those negotiations are set to take place in 2005 and again in 2008.

A policy of a "date-certain" switchover may have drawbacks as well as advantages. If many cable customers do not have DTV equipment by the "date-certain," cable systems may elect to continue to carry analog signals as well as digital signals after the switchover date. FCC officials told us that such a scenario could have two unintended outcomes. First, it could create a *de facto* policy of dual must-carry. Second, the policy could inadvertently harm smaller broadcast stations and their viewers. Once the analog must-carry requirement were to end, many cable systems might choose to continue carrying the analog signals of large stations (which have a large market share) but not of small stations. Thus, some smaller stations would no longer be seen by households that did not have a set-top box or digital television set for processing digital signals.²²

Officials at the National Cable & Telecommunications Association (NCTA) expressed concern that equipment issues could make preparing for a date-certain switchover an enormous and costly task. To continue to receive local broadcast channels via cable once the switchover occurred, consumers whose cable system was no longer providing any analog signals would require either a digital cable-ready television set or some form of cable set-top box. Digital cable-ready television sets are not yet available on the market, and some consumers are resistant to using set-top boxes. NCTA officials also said that smaller cable systems with no digital capability at all may need some kind of exemption. These officials also noted that a date-certain switchover policy would place much of the burden of the DTV transition on the cable industry and its customers, even though the DTV transition was promoted by and pertains to broadcast television stations.

²² Although these problems could be alleviated by prohibiting cable systems from carrying analog broadcast signals once must-carry rights transfer from analog signals to digital signals, such a prohibition would likely be challenged in court.

The concern expressed by NCTA officials regarding the focus of a policy on cable subscribers is understandable. However, given that more than two-thirds of Americans get their television via cable, and given that the DTV tuner mandate will not take full effect for several more years, policies targeted at cable households could be important to meeting the 85 percent threshold in a timely fashion. NCTA officials' concern about ensuring that consumers have the necessary equipment for a date-certain switchover is also understandable: the rollout of DTV-compatible cable equipment will likely be costly, cumbersome, and confusing. However, it is important to note that for the DTV transition to occur, this rollout will occur with or without a date-certain switchover. Setting a date-certain would simply help to ensure that cable customers transition within a certain time frame, but it may not necessarily increase the cost or complication of readying cable subscribers for the transition to DTV.

Availability of Digital Programming Is Increasing but Still Limited, Possibly Due in Part to Copy Protection Concerns

DTV allows for a variety of new forms of content, including HD, and an increased supply of true digital content is an important element in encouraging consumer adoption and cable carriage of DTV. Both broadcast networks and cable networks have greatly increased the amount of digital content they provide, although this still represents a relatively small portion of all television programming. Disincentives to the provision of more digital content include the small market share of viewers able to watch DTV, the cost and complexity—relative to this small market share—of filming or formatting HD programming, and possibly concerns about unauthorized copying and retransmission of digital content provided over the air.

DTV Allows for High Definition and Other New Forms of Content

The creation and delivery of digital programming is a key element in speeding the DTV transition. Consumers have little incentive to purchase costly digital television sets when little digital programming is available. Likewise, cable systems are not likely to use their limited channel capacity to carry broadcasters' digital signals if those signals simply duplicate what is already on the broadcasters' analog signals.

DTV allows for a number of different programming options. True digital programming has actually been filmed in digital or has been converted from a high-resolution format (such as 35 mm film) to a standard definition or high definition digital format. Alternately, a broadcast station can simply duplicate the programming shown on its analog channel by scanning it and "converting" it to digital. FCC gave broadcasters flexibility in determining how to use their digital signals and did not specifically

require that broadcasters provide any programming in high definition. Indeed, many broadcasters have already said that they intend to use their digital channel to multicast several channels of standard definition at once, rather than to provide HD.

The camera, editing, and production equipment that most broadcast stations and networks currently use to film and produce live programming—such as sports or news—cannot be used for HD broadcasts, which require special equipment. By contrast, most recorded programming, such as scheduled dramas and situation comedies, has been shot in the past few years using 35 mm film or high-resolution videotape that can be converted into a variety of formats. These formats can include standard definition analog, standard definition digital, and high definition digital as well as either a traditional aspect ratio or “widescreen.”²³

Amount of Digital Programming Is Increasing but Still Relatively Limited

As of August 28, 2002, 460 broadcast stations in 136 markets were broadcasting a digital channel. However, much of the programming on those channels is not true digital content, but rather programming that has been duplicated from a station's analog channel and converted to a single stream of standard definition digital. In a survey of broadcast stations that we conducted in the fall of 2001,²⁴ 74 percent of the stations that had begun broadcasting a digital signal and that responded to our survey said they were providing at least some HD content—an average of 23 hours per week. In subsequent interviews, broadcast stations told us that the amount of HD content they provide on their digital channel generally depends on the programming feed provided to them by their affiliated network. HD content (as opposed to content in standard definition digital or merely converted from analog) is generally believed to be the most important factor in encouraging consumer adoption and cable carriage of DTV.

The national broadcast networks are mixed in terms of the amount of HD programming they provide, as follows:

²³An “aspect ratio” refers to the shape of the picture on the screen. A traditional analog television has an aspect ratio of 4:3, meaning that the screen is 4 units wide and 3 units high. DTV is often in a “widescreen” format, which has an aspect ratio of 16:9, similar to a movie theater.

²⁴For a more detailed discussion of the survey results, see GAO-02-466.

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- CBS was the first commercial network to provide substantial HD programming. Nearly all of its scripted prime-time situation comedies and dramas are available in HD, as are many national sports broadcasts, certain movies, and one daytime soap opera.
 - ABC began providing nearly all of its scripted prime-time programs in HD during the 2001-02 television season. It also provides some sports programming in HD.
 - NBC, until recently, has provided relatively little HD programming, primarily *The Tonight Show*, one prime-time drama, and certain sports broadcasts. NBC has said it will be providing several more hours-per-week HD programming in the 2002-03 television season.
 - Fox network provides virtually no HD content. It does provide more than two-thirds of its prime-time programming in "Fox Widescreen," a digital, standard definition format.
 - PBS provides several programs per month in HD, mostly in the form of special programs and series.
 - WB, UPN, and PAX—the three smaller national networks—have provided virtually no HD or other true digital content. WB has announced it will begin providing about 5 hours per week of prime-time HD during the 2002-03 television season.

Among cable networks, HBO, Showtime, and Discovery each has a channel that provides programming that is either exclusively or primarily in HD. Other cable networks, including Madison Square Garden and A&E, have occasional special programming in HD. HDNet shows programming that is exclusively in HD; it is currently available only via DirecTV, although the network is expected to offer a channel on cable systems in the near future. ESPN has said it will begin an HD channel next year. Most other major cable networks, including CNN and MTV, are not currently offering any HD programming.

Networks Face Incentives and Disincentives to Providing More Digital Content

Chairman Powell's proposal for voluntary industry actions to speed the DTV transition called on the top four broadcast networks, as well as HBO and Showtime, to provide HD or other "value-added DTV programming" during at least 50 percent of their prime-time schedule beginning with the 2002-03 season. We spoke with executives of four national broadcast networks, three major television studios, three cable networks, and other industry representatives to learn their incentives and disincentives for producing or delivering more HD and other true digital programming. Broadcast networks said the main disincentive to providing more HD content is the small number of viewers currently able to watch HD. Because the market share for HD content is small, HD programming

provides little in the way of significant additional revenue opportunities. In addition, there is relatively little demand or pressure from viewers to provide more HD content.

Networks and studios told us that in absolute terms, the cost of converting most recorded programming—such as films, situation comedies, and dramas—to HD is relatively low, adding perhaps \$8,000 to \$10,000 for a 1-hour show. In addition, the cost of transmitting a high definition signal to broadcast stations is not significantly higher than that of transmitting a standard definition digital signal. However, industry representatives noted that given the small market share for HD, in relative terms these costs are not insignificant. In addition, the cost and complexity of providing live programming, such as sporting events, in HD can be substantial because of the need for separate cameras and production facilities.

Broadcast networks that are providing HD content say they are doing so not for any short-term profit but rather for long-term benefit. For example, they want their programming to be available in HD when it is sold for syndication years from now. Cable networks providing HD told us they want to be forward-looking and provide innovative, state-of-the-art programming that adds value and distinguishes them from other networks.

We asked officials at two major broadcast networks, NBC and Fox, why they were providing relatively little HD content. NBC officials said that the studios that produce some of their programming have not been able to provide it in HD format in a timely enough manner. They also said that conversion to HD format was costly relative to the small number of viewers able to watch HD programming. They noted that other networks were doing more HD in part because those networks had agreements with consumer electronics companies to underwrite some of their HD production costs. Fox officials said they provide the great majority of their prime-time programming in "Fox Widescreen," which, while not HD, provides a widescreen aspect ratio and a better picture quality than the traditional analog signal. In addition, they said that their standard definition digital format allows them to provide more live programming, such as sports, in a digital format because separate HD cameras and production facilities are not required.

Because television advertising ultimately funds most network programming, we spoke with three major television advertisers and reviewed the trade literature, to assess advertising's role in affecting network decision-making regarding digital content. Overall, we found that advertising revenues are not a significant driver in the DTV transition.

Almost no advertising is produced in HD. In addition, due to low viewership, few advertisers are currently expressing special interest in placing ads on programs shown in HD. Advertisers also told us that networks and broadcasters are not making significant efforts to get them excited about DTV and any possibilities it holds with regard to advertising. However, with an eye to the future, two large advertisers said they have actively begun exploring the possibilities of DTV advertising to be ready when DTV becomes more widespread.

Copy Protection Concerns Are Still Being Addressed

Many content providers say they are reluctant to provide high-value digital content over the air via DTV because they are concerned about consumers making unauthorized copies as well as redistributing the content over the Internet. DTV raises special concerns about copy protection primarily for two reasons. First, in the digital world, each copy is an exact replica of the original, whereas in the analog world, each successive copy degrades in quality. Second, digital content can be easily and widely transmitted on the Internet, whereas analog copies must typically be physically transferred from user to user.

In October 1998, the Digital Millennium Copyright Act (DMCA) was signed into law.²⁵ The DMCA amended and updated the Copyright Act of 1976²⁶ with respect to the use of copyrighted works in digital contexts. Most relevant to DTV, the DMCA makes it a crime to circumvent copyright protection ("antipiracy") technologies, such as encryption and scrambling. In other words, the DMCA makes it a crime to intentionally create hardware or software to bypass technology designed to prevent unauthorized copying.

At the same time, the DMCA does not require that consumer electronics manufacturers actually include in their consumer products technology to protect against piracy of DTV broadcasts. In 1998, five consumer electronics manufacturing companies began working together to develop a standard for copy protection, resulting in the Digital Transmission Content Protection technology, commonly known as "5C." This technology is designed to protect DTV content from unauthorized copying or redistribution by DTV home consumers. The seven major studios that

²⁵P.L. 105-304, 112 Stat. 2860 (1998).

²⁶17 U.S.C. §101 *et seq.*

produce television content, as well as the cable industry, have agreed that 5C meets most of their key requirements for adequate copy protection.

However, as initially developed, 5C protects content delivered over cable or satellite service, but not content delivered over the air. All of the studios, as well as major broadcast networks, have expressed concern about this, and five of the studios have refused to sign licensing agreements using 5C technology until it covers over-the-air broadcasts. Broadcast networks in particular are concerned that without protection for over-the-air content on DTV, content providers will move their programming to cable and satellite channels where copyright protection is stronger.

To address copy protection for over-the-air content, studios want the use of a "broadcast flag," which would identify rules for how particular content could be used. The flag would be recognized by technology embedded in digital television sets and other devices that receive DTV broadcast signals. For example, the flag might signal to a copy device that the user is allowed to make personal copies of a particular television program but would prevent that user from distributing those copies on the Internet. For a broadcast flag to be effective, a government mandate may be required to prohibit electronics makers from manufacturing products that did not follow the instructions of the flag.²⁷

In August 2002, FCC initiated a rulemaking exploring whether it can and should mandate the use of a copy protection mechanism for DTV. FCC is seeking public comment on several issues, including the need for a broadcast flag, the appropriate implementation of various copy protection technologies, and the extent to which FCC has jurisdiction regarding DTV copy protection issues.

Much of the debate over copy protection centers on finding the correct balance between the consumer's right to view and copy material and the intellectual property rights of copyright holders. In the 1984 Supreme

²⁷ Another copy protection problem is what is commonly referred to as the "analog hole." Consumers with analog television sets can watch digital signals using a set-top converter box that converts the signal from digital to analog. However, this process currently strips the signal of any copy protection, meaning it would be possible to convert the content back into an unprotected digital form that could be illegally copied and redistributed. A technology similar to a broadcast flag could be developed to "plug" the analog hole, but this is still being negotiated by content providers and consumer electronics manufacturers.

Court case *Sony Corporation of America v. Universal City Studios*,²⁸ the court ruled that "fair use" doctrine²⁹ gives consumers broad latitude to record television programs for noncommercial use in the home. The Consumer Electronics Association argues that copy protection technologies should not be allowed to impinge on fair use rights, which would deprive the public of equal and fair access to information, entertainment, and education. Content producers, represented by organizations such as the Motion Picture Association of America, argue that mandated copy protection is essential in the digital era if intellectual property rights are to be preserved. Without sufficient protection, they say, content providers will not be willing to provide high-value content via digital broadcast television.

Copy protection issues are very important to the content and consumer electronics industries, and the debate has been contentious. However, DTV is only one part of a larger debate about copy protection in the digital era; the issue also encompasses recorded music, films, and other media. Many observers with whom we spoke in the content, consumer electronics, and broadcast industries said that DTV copy protection is an important hurdle that needs to be resolved. At the same time, many believed that copy protection issues were ultimately less of a roadblock to the DTV transition than other key challenges.

Digital Over-the-Air Tuners Have Been Mandated, but Digital Cable-Ready Capability Has Not

To speed the DTV transition, FCC has adopted an order requiring that by 2007 most new broadcast television sets include a tuner capable of receiving digital signals over the air. Another policy option would be to pair the over-the-air mandate with a requirement that new television sets also be digital cable-ready. Because many more American households receive television via cable than receive it over the air, mandating digital cable-ready capability could be an effective policy for speeding the DTV transition if the marginal cost of this requirement were found to be reasonable. (See app. II for a discussion of other equipment issues that are affecting the DTV transition.)

²⁸ 464 U.S.C. 417 (1984).

²⁹ The fair use doctrine permits copying of copyrighted works for such purposes as criticism, commentary, news reporting, teaching, scholarship, or research. 17 U.S.C. §107.

Over-the-Air DTV Tuner Mandate Will Spur the Transition, but Standing Alone May Be Inefficient

On August 8, 2002, FCC adopted an order requiring that most new broadcast television sets, as well as other equipment like VCRs that may contain broadcast receivers, include the capability to receive DTV signals.³⁰ This DTV tuner mandate is being phased in over time on the basis of the size of the television set. For example, all new sets of 36 inches and above must have DTV tuners by July 1, 2005, while sets of 13 inches and above must have the tuner by July 1, 2007. FCC said that its jurisdiction to impose a DTV tuner mandate is established by the All Channel Receiver Act of 1962, as amended, which gives FCC the authority to require that television sets be capable of adequately receiving all frequencies allocated by FCC for television broadcasting.

Currently, very few television sets sold in the United States are capable of receiving digital broadcasts. FCC said it adopted the DTV tuner mandate to ensure that consumers are provided with the capability to receive broadcasters' digital signals and to move more rapidly toward completion of the DTV transition. FCC also noted that the additional cost per television set will be minimized by the large manufacturing volumes that will result from the mandate. The National Association of Broadcasters, which strongly supported the mandate, has cited estimates that the cost of imposing a DTV tuner mandate may be as low as \$16 per set by 2006.

Opponents of the DTV tuner mandate, which include the Consumer Electronics Association, cite different estimates, saying that the mandate could raise the price of a television set by as much as \$250. Moreover, opponents say it is an inefficient policy, given that more than four-fifths of American households subscribe to a cable or satellite service for their primary television set and may not need or use a digital broadcast tuner. They argue that consumer demand, rather than a government mandate, should drive whether digital tuners are offered in television sets.

Both sides of the tuner mandate issue raise valid points. Because more than 25 million new television sets are sold each year, the DTV tuner mandate will undoubtedly allow the 85 percent DTV penetration rate to be reached more quickly. In addition, most experts believe that the per-unit cost of the mandate, while hard to predict, is not likely to be very high once the economies of large-scale production are achieved. At the same

³⁰*In the Matter of Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, MM Docket No. 00-39, *Second Report and Order and Second Memorandum Opinion and Order*, FCC 02-230, released Aug. 9, 2002.

time, the tuner mandate raises questions of economic efficiency: all consumers purchasing sets of 13 inches or over will be paying for a DTV tuner that the majority of them (those who receive their primary television via cable or satellite) may be unlikely to use.

Moreover, although the DTV mandate will help reach the 85 percent threshold more quickly, it will do so largely because cable and satellite households that purchase new television sets that include the digital over-the-air tuner will count toward the threshold even though they may not actually watch their television over the air. To watch local digital broadcasts over cable or satellite—presuming those broadcasts were being carried by their cable or satellite operator—many of these households would need additional equipment. The tuner mandate thus could result in a scenario where analog signals are turned off in a market because 85 percent of households are capable of receiving local DTV channels over the air—but the majority of those households are cable or satellite customers who, in practice, are not actually using their set for over-the-air reception.

Mandate for All Televisions to Be Digital Cable-Ready Might Have Benefits

Cable and over-the-air television each uses a different digital format and thus each requires a different type of tuner to decode digital signals. Although a digital over-the-air tuner has been mandated, another option would be to additionally mandate that new television sets be digital “cable-ready.” With a digital cable-ready television set, the cable line would plug directly into the set and digital signals could be viewed without need of a cable set-top box. Cable-ready analog television sets have been available for many years, but there are no cable-ready digital television sets currently on the market. Digital cable-ready sets could be important to the DTV transition because consumers may be more likely to purchase digital television sets if the set does not require a set-top box to access cable service.

Digital cable-ready capability is more complicated than analog cable-ready capability, and there is no one definition for what constitutes a digital cable-ready television set. FCC and television manufacturers generally consider a digital cable-ready set to include, at a minimum, a digital cable tuner (to receive and process digital signals) and a slot for a “point of

deployment" (POD) security device (to handle encrypted cable programming).³¹

In February 2000, after much negotiation, the Consumer Electronics Association and the National Cable & Telecommunications Association submitted to FCC an agreement of basic technical standards for a digital cable-ready television set. However, since that time, the two industries have been unable to resolve details related to that agreement, including licensing and programming guide issues. Television manufacturers say they are reluctant to roll out digital cable-ready sets until all cable systems implement the agreed-upon technical standards, and they have requested that FCC implement a timetable for national cable standards. FCC and the Congress are monitoring the negotiations but so far have left the issues to the industries to resolve on their own and, to date, have not imposed any significant requirements regarding digital cable-ready television sets.

Because far more households receive local broadcast signals via cable than via over the air, pairing a digital cable-ready mandate with the existing over-the-air tuner mandate might be an efficient policy for ensuring that households are able to receive and watch DTV signals. It is not clear what the additional manufacturing cost would be of incorporating digital cable tuners and POD slots into television sets that already include digital over-the-air tuners. The Consumer Electronics Association has stated that because the electronic components for digital cable tuners are almost identical to those for digital broadcast tuners, "manufacturers could include combination broadcast and cable tuners in their products at a cost that would be little greater than the cost of either a broadcast-only tuner or a cable-only tuner."³² Nonetheless, a more detailed cost-benefit analysis would need to be undertaken before such a policy was implemented, particularly in light of the probable requirement for a POD slot to make the set digital cable-ready.

³¹FCC has adopted three definitions to designate a digital television set as digital cable-ready. Under all three definitions, the set includes a digital cable tuner and a POD slot. Under two of the definitions, the set also includes other functionalities, such as digital inputs and support for interactivity. See *In the Matter of Compatibility Between Cable Systems and Consumer Electronics Equipment*, PP Docket No. 00-67, *Report and Order*, FCC 00-342 (released Sept. 15, 2000).

³²Letter to W. Kenneth Ferree, Federal Communications Commission, from Michael Petricone, Consumer Electronics Association, filed in CS Docket No. 97-80, *Implementation of Section 304 of the Telecommunications Act of 1996; Commercial Availability of Navigation Devices*, and PP Docket No. 00-67, *Compatibility Between Cable Systems and Consumer Electronics Equipment*, Sept. 11, 2002.

The idea previously discussed in this report for a "date-certain" cable switchover from analog signals to digital signals might be especially effective if paired with a mandate that all new television sets sold be digital cable-ready. Because about 25 million new television sets are sold each year, significant numbers of households would own a television set capable of receiving digital signals via cable without the need for a set-top box by the date-certain cable switchover, thereby lessening the need of cable subscribers to obtain set-top boxes when the switchover occurs.

Direct broadcast satellite service, like cable and over the air, requires a digital tuner to decode the digital signal and turn it into the picture that appears on the television screen. Satellite uses a third format for transmission of digital signals. Some digital television sets on the market are digital "satellite-ready" in that they incorporate a satellite tuner and do not require a set-top box to receive satellite service. However, a satellite DTV tuner mandate would not help reach the 85 percent threshold to the extent that a cable DTV tuner mandate would. First, there are many more cable subscribers than satellite subscribers in the United States. In addition, unlike cable operators, satellite operators are not required to carry local broadcast channels (although if they choose to carry any local channels in a market they are required to carry all of that market's channels). Satellite companies are uncertain about their plans for offering local broadcasts once the DTV transition is complete. This is partly because the HD programming that many local stations will be providing requires greater bandwidth than current analog programming, and this will impact the satellite systems' capacity to carry local broadcast stations.

Conclusions

The DTV transition will affect nearly all Americans by changing the nature of television—a main source of news and entertainment—and requiring nearly every household to obtain new equipment. Despite this, few Americans seem aware of the DTV transition and the implications it will have for them. This lack of knowledge is, in and of itself, a barrier to the transition's timely completion. It is likely a factor in the sluggish sales for DTV equipment and the lack of pressure by viewers for networks to provide more HD programming and for cable systems to carry local digital broadcasts. To date, FCC has made recommendations to the private sector but has not undertaken significant initiatives of its own to increase public awareness about DTV and the transition.

Until recently, laws passed by the Congress and rules implemented by FCC regarding the DTV transition have been focused largely on the rollout of DTV signals by broadcast stations. But factors driving consumer adoption

also are important because the transition cannot be completed until sufficient numbers of households can view the digital broadcasts. The realization of most of these factors has largely been left to market forces. Generally, market-driven adoption of new technologies is considered best, but the current circumstances in the DTV transition suggest that it is unrealistic to anticipate that market forces will bring about the completion of the transition within the originally anticipated time frame. Thus, it would be helpful for policy-makers to better understand the various options that could be implemented to advance the timeliness of the DTV transition.

FCC's recent DTV tuner mandate serves as a notable exception to the transition's market-driven approach. However, that mandate alone—which will not take full effect until mid-2007—may not be enough to complete the transition in a timely and reasonably seamless manner. An additional option would be to require digital cable-ready capability in addition to the over-the-air digital tuner. Because more than two-thirds of households receive cable, mandating that televisions be digital cable-ready may prove a cost-effective policy option for hastening the DTV transition, particularly when paired with the existing over-the-air mandate. While the additional cost of the digital cable tuner is likely small, it is less clear what the incremental cost of the POD slot would be. In addition, outstanding cable compatibility issues would need to be resolved before a digital cable-ready mandate could be implemented.

Another policy option related to DTV that we have identified is to set a date-certain when broadcast stations' right to invoke a must-carry status for their stations' signals would transfer from their analog signals to their digital signals. This option could have the advantage of speeding up cable carriage of digital signals while avoiding problems inherent in requiring dual carriage. Pairing this date-certain switchover with a digital cable-ready mandate has the potential to be especially effective. The digital cable mandate would ensure that when the switchover did occur, a significant portion of households would both receive local digital broadcast signals and have the equipment in place to view those signals. However, the switchover policy could have disadvantages as well, such as possible adverse effects on smaller stations. As such, this policy would need to be evaluated more closely.

One of the most important goals for completing the DTV transition is the recapture of the broadcast spectrum that televisions stations will be returning. There is significant economic value embodied in this spectrum, and it has been allocated for both public safety needs as well as for new

commercial services. Delays in completing the DTV transition would compromise for some time the ability to fully utilize this spectrum. Understanding the relative time frames for the transition—that is, the time frame with and without certain policy changes—is key to understanding the implicit cost to society of allowing the transition to move at its current pace. Ultimately, decisions about implementing further legal or regulatory changes to speed the DTV transition require balancing the costs and burdens of those changes with the benefits of returning the broadcast spectrum in a timely fashion.

Recommendations for Executive Action

Some issues affecting the DTV transition, such as the production of HD television programming, are largely outside of traditional federal legislative or regulatory control. Other issues, such as inclusion of an over-the-air tuner, have already been addressed by FCC or are the subject of ongoing proceedings. Our recommendations are in areas over which FCC or the Congress have authority, and that have not been widely discussed but could have an important impact on the success of the DTV transition and the speed with which spectrum used for broadcasting can be returned for other uses.

We recommend that the Chairman of the Federal Communications Commission take the following actions:

1. Explore options to raise public awareness about the DTV transition and the implications it will have. For example, FCC might consider a public education campaign of its own, or it might consider partnering with the affected industries to provide consumers with more information about DTV products and the DTV transition. Such actions could help speed consumer adoption of DTV equipment as well as inform the public about a transition that will affect nearly all Americans.
2. Direct the relevant FCC bureaus and offices to examine the costs and benefits of mandating that all new televisions be digital cable-ready in addition to the existing mandate for a digital over-the-air tuner. As part of this process, FCC should conduct an independent analysis that estimates (1) the additional cost to consumers of adding a digital cable tuner and POD slot and (2) the timetable of the DTV transition with and without such a mandate. FCC should then report its recommendations as to the actions it believes the Commission or the Congress should take regarding a digital cable-ready mandate.

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3. Direct FCC's Media Bureau to examine the advantages and disadvantages of a policy that would set a date-certain for cable carriage to switch from full carriage of analog signals to full carriage of digital signals. Such a policy could be implemented by transferring broadcasters' must-carry rights from analog to digital on that date, or through some other means. The Chairman also should direct the Media Bureau to examine the possibility of combining such a policy with a digital cable-ready mandate. As part of this examination, FCC should estimate the amount of time it will take for the DTV transition to be completed with and without implementation of these policy options.


Agency Comments

We provided a draft of this report to FCC for review and comment. In its comments, which are reprinted in appendix IV, FCC said the report analyzes some of the difficult challenges facing the DTV transition and should add useful input to the policy-making process. FCC agreed that it is important to explore options for raising public awareness, and emphasized that Chairman Powell has called on industries involved in the transition to take concrete measures to educate the public about the DTV transition and its implications. Regarding our recommendation on cable-ready DTV equipment, FCC noted that it has been engaged in a long-term effort to achieve compatibility between digital television sets and cable systems, and that many of the technical standards for digital cable-ready sets were not finalized until recently. FCC said it will be addressing these issues in a forthcoming Report and Order. Regarding our recommendation related to a date-certain for transfer of must-carry rights from analog signals to digital signals, FCC noted that its digital carriage proceeding sought comment on a wide range of options regarding must-carry, including an option similar to the one we described in our draft. FCC said that the record is now closed in that proceeding, and that its staff is preparing a draft order for the Commission's consideration. The actions described by FCC in their response are positive steps; however, we believe the Commission should also adopt our specific recommendations. FCC also provided us with technical changes to the report, which we incorporated where appropriate.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 14 days after the date of this letter. At that time, we will send copies to interested congressional committees; the Chairman, FCC; and other interested parties. We also will make copies available to others upon request. In addition, this report will be available at no cost on the GAO Web site at

<http://www.gao.gov>. If you have any questions about this report, please contact me at 202-512-2834 or guerrerop@gao.gov. Key contacts and major contributors to this report are listed in appendix V.

Sincerely yours,

A handwritten signature in black ink, appearing to read "P. Guerrero", with a stylized, looped flourish extending to the right.

Peter Guerrero
Director, Physical Infrastructure Issues

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Digital Television and the Law: January 1999

The Gore Commission Report on Public Interest Obligations of Digital Broadcasters

Self-Regulation and Increased Flexibility

By [James M. Burger, Esq.](#) and [Todd Gray, Esq.](#)

[Dow, Lohnes & Albertson, pllc](#)

In the **Fifth Report and Order** in the proceeding on **Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service** ([reference 1](#)), the Federal Communications Commission gave each existing television station an additional channel to transmit digital television during the transition to an all digital TV world ([reference 2](#)). In return, stations are required to build digital facilities capable of transmitting a digital signal. Some have questioned, however, whether there should also be additional "public interest requirements" for Digital Television ("DTV") stations.

President Clinton established the Advisory Committee on Public Interest Obligations of Digital Television Broadcasters, known as the Gore Commission, in order to recommend specific public interest obligations for DTV stations ([reference 3](#)). The Gore Commission included "members of the commercial and noncommercial broadcasting industry, computer industries, producers, academic institutions, public interest organizations and the advertising community" ([reference 4](#)). Its final report was released December 18, 1998.

Supporters of increasing the public interest obligations of broadcasters have argued that broadcasters have been given a gift of free, additional spectrum with which to offer new and potentially profitable services. This spectrum could have been auctioned by the government and the proceeds of the auction could have been used to support various public needs. The government, however, chose to lend the spectrum to broadcasters so that they could make the transition from analog television to digital television. After the transition, broadcasters will have the ability to use their spectrum in a number of ways, including the offering of multiple programming options, datacasting, and perhaps telecommunications services, all of which can result in increased revenue to stations. Because broadcasters have been given the spectrum, and the opportunities it comes with, some believe that they should have an increased obligation to serve the public interest.

While some view the lending of additional spectrum to broadcasters as a gift, many broadcasters themselves view the transition to digital as a mandate. The transition to digital is required for television stations, who will each spend millions of dollars to build digital facilities for transmission and program production. Stations are unsure if their investment will ever be recovered. Advertisers may be unlikely to pay a premium for time on digital television if the number of viewers doesn't increase, and regardless of the talk of ancillary services, broadcasters have little idea of what options really exist and if they will be profitable. For many broadcasters, especially independent stations, the additional spectrum for the transition to digital may be more of a liability than a gift.

Because the success of the transition to digital is far from guaranteed, many in broadcasting believe the public interest is best served by ensuring a seamless and effective transition to digital television. Rather than creating new public interest obligations for broadcasters, they argue, leaders in both the private and public sector should be focused on helping stations and the public make the transition to digital television. This requires attention to technical and economic realities which may delay the public's acceptance of digital television. Simply put, increasing public interest obligations of digital television broadcasters may be premature and perhaps even irrelevant if the industry fails to sustain an effective transition to digital television.

Television stations are currently obligated to serve the public interest ([reference 5](#)). Foremost,

broadcasters are required to serve their communities' needs with programming that addresses issues of local significance ([reference 6](#)). In addition, broadcasters must air a minimum amount of educational children's programming, and must limit the amount of advertising shown during all children's programming ([reference 7](#)). Further, broadcasters must offer political candidates local access to their facilities ([reference 8](#)). Additionally, stations are increasingly required to close caption their programming for hearing-impaired persons ([reference 9](#)). Finally, stations must afford equal employment opportunity to job applicants and employees ([reference 10](#)).

The Gore Commission Report

President Clinton established the Gore Commission to "study and recommend what public interest responsibilities should accompany the broadcaster's receipt of digital television licenses ([reference 11](#)). " The Gore Commission's report, released on December 18, 1998, states reliance on three basic principles in reaching its conclusions. First, the public should benefit from the transition to digital. Second, recommendations for public interest obligations should be flexible enough to evolve with technology. Third, information, voluntary self-regulation and economic incentives are preferable to regulation. However, the Gore Commission believes that the government may need to have a role if the market fails to ensure that DTV stations serve the public interest. The Gore Commission has suggested that a number of new public interest obligations be applicable to digital television, in addition to current obligations.

Disclosure of Public Interest Activities by Broadcasters: The Gore Commission recommends that information pertaining to a broadcaster's undertakings to meet its public interest obligations be made available to the public. While some information is currently available at the station's headquarters, the Gore Commission encourages the FCC to require stations to make more detailed information available on a quarterly basis. In addition, stations should take steps to ensure a broad distribution of this information, either through cooperation with local newspapers or perhaps over the Internet. Without adequate information regarding a broadcaster's public interest activities, the Gore Commission believes that citizens are ill equipped to evaluate a station's value to the community at renewal time.

Voluntary Standards of Conduct: The Gore Commission believes that voluntary self-regulation is superior to government mandated regulation. In its report, it suggests that the National Association of Broadcasters draft a set of statement of principles or standards for the industry ([reference 12](#)). However, the government should not interfere with the creation of the standards, as the "public, the marketplace and the court of public opinion can then judge their efficacy."

Minimum Public Interest Obligations: Because up to four hundred broadcasters do not belong to the NAB, and because there is no guaranteed means of enforcing voluntary guidelines, the Gore Commission recommends that such voluntary standards be supplemented with minimum public interest obligations. The Gore Commission recommends that broadcasters engage in community outreach in order to ascertain local needs and interests. Further, broadcasters, as discussed above, should be required to publicly disclose their public interest activities on a quarterly basis. Additionally, broadcasters should have minimum requirements for public affairs programming and for public service announcements, which should run in all parts of the day. Finally, all of a station's public affairs and political programming should be closed captioned. In order to ensure that the benefits of the public interest programming reach viewers, the Gore Commission strongly encourages the FCC to implement digital must carry, although it recognizes that immediately requiring a cable system to carry both the analog and digital signal of a station might not be in the public interest.

Multicasting: The Gore Commission suggests that the FCC should apply a two-year moratorium on additional public interest obligations for stations that choose to multicast (that is, transmit more than one programming service at a time) in order to allow broadcasters to explore options in the market place. After the two-year moratorium, the FCC should give broadcasters that choose to multicast a menu of options. Initially, broadcasters can choose to pay a fee based on revenues received from multicasting. In the alternative, broadcasters can opt to dedicate one of the multicast programming services to the "public interest," which might include offering educational programming or providing political parties an opportunity to air their views. The Gore Commission also recommends allowing stations to spread their public interest obligations over a number of multicasted programming services, rather than dedicating a single service.

Public Broadcasting: According to the Gore Commission Report, money received from the fees

paid by broadcasters based on multicasting should be used to fund additional public broadcasting channels. When the transition to digital is complete, each broadcaster will be required to return one of its TV channels to the government, which will auction it. The Gore Commission urges Congress to reserve one such "recycled" six megahertz channel in each market for noncommercial educational use, focusing on the needs of the underrepresented and minorities. In addition, the Gore Commission encourages Congress to fully fund these channels ([reference 13](#)) and to assign the Department of Education as a clearinghouse for programming ideas. The current public broadcasting station in each viewing area would have the first opportunity to operate the new channel.

Political Discourse: The Gore Commission recognizes that there are many problems surrounding political campaigns, and the influence of broadcast television. However, it focused on voluntary efforts of broadcasters rather than the creation of new, mandatory political regulations ([reference 14](#)). The Gore Commission recommends that the industry "redouble its efforts voluntarily to enhance campaign discourse" and offers a few specific suggestions. First, broadcasters should provide five minutes each night for candidate-centered discourse in the thirty days before an election. This would be a voluntary standard, which would allow each station to choose the issues and candidates deserving more attention. Second, the Gore Commission urges broadcasters to strike a deal with Congress: if Congress passes comprehensive campaign finance reform, broadcasters will commit to reforming the role of television in campaigns. For example, broadcasters might offer free airtime for candidates in exchange for the repeal of the lowest unit rate requirement. In the alternative, broadcasters could support a "broadcast bank," funded by fees from ancillary or supplementary services, as well as fees from multiplexing, which could be used to buy airtime for political campaigns. The Gore Commission recommended one regulatory change. Currently, broadcasters can avoid the "equal opportunities" requirement for state and local candidates by refusing to air any advertisement for state or local campaigns. The Gore Commission recommends that the FCC prohibit the blanket refusal to air state and local campaign advertisements.

Disaster Warning: Broadcasters have long recognized their obligation to warn the public of impending natural disasters. Digital technology will allow broadcasters to continue this service and provide more detailed information, such as which neighborhoods, or even houses, are most at risk. The Gore Commission recommends that broadcasters work with emergency communication specialists to develop the most effective means of informing the public about such dangers. In addition, the Gore Commission urges the government to work with digital television manufacturers to ensure that digital TVs are modified to handle such transmissions from broadcasters.

Disability Access to Digital Programming: The Gore Commission recommends that broadcasters work with television set manufacturers to continue to develop ways to provide programming access to the disabled, including the use of multiple audio channels and captioning, particularly of public services announcements and disaster warnings.

A Pay or Play Model of Public Interest Obligations: Apparently recognizing that its immediate recommendations are limited, the Gore Commission also recommends future consideration of new models for public interest obligations of the DTV stations. Specifically, the Gore Commission focuses on a model which would allow a broadcaster to continue to act under the traditional public interest regime or bypass such obligations by paying a share of its revenue - "pay or play." Revenues collected from those opting out of public interest obligations could be used to create programs specifically directed at responding to the public interest. Some broadcasters and non-broadcasters feel that the pay or play model may offer broadcasters important options in running their businesses. Some members of the Gore Commission fear, however, that the model would do damage to the public interest, as many commercial stations could buy their way out of obligations, which would, in effect, limit all public interest programming to noncommercial channels.

Conclusion: the Impact of the Gore Commission

The findings of the Gore Commission are merely recommendations. Absent implementing action by the FCC, to the extent that it has authority to adopt the Gore Commission's recommendations, or by Congress, the recommendations will have little impact. The FCC has promised to issue a Notice of Proposed Rulemaking in April of 1999 to consider implementation of the Gore Commission recommendations. The FCC may have the authority to adopt a number of the

recommendations, such as public service announcements, closed captioning and a "Pay-or-Play" model of regulation. While the FCC has promised to begin a rulemaking procedure, there is no guarantee that the FCC will ever adopt the Gore Commission recommendations, including the minimum standards. Further, only Congress has the authority to implement other important recommendations such as reserving a 6 MHz channel in each market for a public broadcasting station and setting aside funds for educational television. Therefore, the true impact of the Gore Commission Report will not be known for some time, and in the meantime public interest obligations may be determined by the voluntary actions of the broadcasters.

Appendix A

Current Public Interest Obligations of Broadcast Stations

Broadcast stations currently have a number of requirements that form the core of their obligation to serve the public interest, convenience and necessity.

Service to Local Needs: Stations have an affirmative obligation to broadcast programming that serves the needs of their communities ([reference 15](#)). This obligation is normally met by airing news, informational, public affairs and similar programming that addresses issues of significance. The Commission's evaluation of that service (at license renewal time) relies to a large degree on input from citizens or other interested parties, and on periodic "issues-programs" lists that stations make available in their public inspections files.

Children's Programming: Congress passed the **Children's Television Act of 1990** which established a minimum number of hours of children's educational programming and a cap on the amount of advertising that may be broadcast during children's programming ([reference 16](#)). Specifically, stations must air at least three hours a week of programming that "further positive development" of children sixteen years and younger. In addition, advertising during children's programming is limited twelve minutes per hour during the week and ten minutes on the weekends.

Political Broadcasting: Sections 312(a)(7) and 315 of the Communications Act require broadcasters to provide "reasonable access" to their facilities by candidates for federal elective office, and "equal opportunities" for federal, state and local candidates to use their facilities in response to a use by opposing candidates. The law also establishes a regime regulating the maximum rates that can be charged to candidates and imposing substantial record-keeping obligations. These obligations arise out of the special need of our country for an informed electorate.

Access for Persons with Disabilities: In order to allow hearing-impaired persons access to television programming, Congress required that all new television sets be able to display closed captioning ([reference 17](#)). In addition, Section 713 of the Telecommunications Act of 1996 ([reference 18](#)) imposed general requirements that video programming be closed captioned. In the **Report and Order** in MM Docket No. 95-176, 12 FCC Rcd 3272 (1998), the FCC adopted rules creating an eight year transition period beginning in January of 1998, at the end of which, 95 percent of new programming must be captioned. In addition, the FCC adopted requirements or captioning of "old" programming.

Equal Employment Opportunity: Over the course of a number of years, the FCC has adopted and strengthened rules requiring television broadcasters to afford equal employment opportunity to job applicants and employees. Under Section 73.2080 of the FCC's Rules, 47 C.F.R. § 73.2081, stations were forbidden to discriminate in employment because of "race, color, religion, national origin or sex." Moreover, stations were required to adopt an affirmative action EEO program targeted to increasing the number of minorities and women on their workforces([reference 19](#)). These rules were based on the perceived link between a diversified workforce and the responsiveness of a station's programming to community needs.

References

- 1: MM Docket No. 87-268, FCC 97-116 (April 22, 1997). [Back](#)
- 2: At the end of the transition, currently stated to be in 2006, each TV station will return one of its two channels for re-use by others. [Back](#)
- 3: Exec. Order No. 13,038, 62 FR 12065 (March 11, 1997). [Back](#)
- 4: id. [Back](#)
- 5: For a more complete analysis of current public interest obligations of broadcast stations, please see [Appendix A](#). [Back](#)
- 6: This obligation has been recognized by both the FCC and Congress. See e.g. **Commission Policy on Programming**, 20 Rad. Reg. (P & F) 1901, 1913 (1960); **Cable Television Consumer Protection Act of 1992**, Pub. L. No. 102-385, 106 Stat. 1460, 1461 (1992). [Back](#)
- 7: Children's Television Act of 1990, Pub. L. No. 104-437, 104 Stat. 996 (1990) (codified as 47 U.S.C. §§ 303 (a), 303 (b) and 394). [Back](#)
- 8: 47 U.S.C. §§ 312 (a)(7) and 315. [Back](#)
- 9: 47 U.S.C. § 613; **Report and Order**, MM Docket No. 95-176, 12 F.C.C. Rcd. 3272 (1998). [Back](#)
- 10: 47 C.F.R. § 73.2081. [Back](#)
- 11: **Charter of the Advisory Committee on Public Interest Obligations of Digital Television Broadcasters**. [Back](#)
- 12: The National Association of Broadcasters had developed a code of conduct in 1952, however, the Department of Justice objected to some of its provisions on antitrust grounds, which led to the code's abandonment. [Back](#)
- 13: Funding could also come from fees derived from ancillary and supplementary uses of the digital television spectrum. [Back](#)
- 14: Gore Commission recommendations were based on a consensus by committee members. While the Commission came to no consensus regarding mandatory free airtime for candidates, approximately 14 members of the Commission filed separate statements in support of mandatory free airtime. [Back](#)
- 15: This obligation has been recognized by both the FCC and Congress. See e.g. **Commission Policy on Programming**, 20 Rad. Reg. (P & F) 1901, 1913 (1960); **Cable Television Consumer Protection Act of 1992**, Pub. L. No. 102-385, 106 Stat. 1460, 1461 (1992). [Back](#)
- 16: Children's Television Act of 1990, Pub. L. 104-437, 104 Stat. 996 (1990) (codified at 47 U.S.C. §§ 303(a), 303(b) and 394). [Back](#)
- 17: Television Decoder Circuitry Act of 1990, Pub. L. 104-431, 104 Stat. 960 (1990) (codified at 47 U.S.C. §§ 303(u), 330(b)). [Back](#)
- 18: 47 U.S.C. § 613. [Back](#)
- 19: In **Lutheran Church-Missouri Synod v. FCC**, --F.3rd-- (D.C. Cir. 1998), the U.S. Court of Appeals struck down the EEO program requirements as unconstitutional. The FCC currently has pending a rulemaking proceeding to consider what EEO requirements may and should service. **Notice of Proposed Rule Making** in MM Docket Nos. 98-204 and 96-16, FCC 98-305 (released Nov. 20, 1998). [Back](#)

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Public Interest Council

The Gore Commission

ROBERT WRIGHT
Chairman and CEO, NBC, Inc.

Testimony before the Gore Commission
December 5, 1997, Washington, D.C.

Thank you for this opportunity to present NBC's views on the public interest obligations of digital television broadcasters. I am pleased and privileged to be called upon to work together with the distinguished and diverse members of the Advisory Committee in a cooperative, constructive and, hopefully, creative way to help fashion recommendations for continued public interest service by broadcasters in the digital era. Although this Advisory Committee's work does not promise to be easy, there is reason for optimism. None of us would be here today but for the convergence of two enormously positive developments in our nation's history: the evolution of our over-the-air, terrestrial broadcast system and the breakthrough of digital video technology. The system of over-the-air broadcasting that has taken root in the United States during the 20th century is the best in the world. It is a public good because it is both universally available and free to the viewer. More Americans have television sets in their homes, approximately 98 percent, than have telephones. More Americans obtain news and information from broadcast programming than from any other medium. Precisely because of its universal and free character, broadcasting is a critical safeguard against the Information Age deteriorating into divisive worlds of "Information Haves" and "Information Have Nots." Consequently, this Committee's recommendations must ensure the continued vitality and robustness of universal, free, over-the-air broadcast service in the digital age.

At the same time, there is a justifiable interest in optimizing the potential of digital technology to enhance the public interest service of broadcasters where practicable. The digital world of computers has brought literally a whole universe of information accessible through the Internet into the homes of tens of millions of people in America and around the globe. The DTV standard for digital broadcasting adopted by the Federal Communications Commission nearly one year ago creates a remarkably flexible, interoperable digital pipe into the homes of digital viewers.

The challenge confronting this Committee is to formulate recommendations, or perhaps more productively, a framework which will not erode the economic foundations of universal, free, over-the-air broadcasting while facilitating wise utilization of revolutionary digital broadcast technology to serve the public interest. To assist the Committee, my testimony focuses on the essential nature of broadcasters' public interest obligations today, the business realities of digital broadcasting, and a set of principles, derived from our shared experience, which can

chart the course for the future evolution of broadcasters' public interest service.

At the outset, let us establish some common ground. Broadcasters take our role as stewards of the public trust very seriously. Currently, we serve the viewing public on the national and local levels by providing news and information, children's programming and coverage of a wide range of community-based activities. There is unified support in the broadcast industry that we should continue this public interest service in the digital era. The only issue to be resolved is whether and how our public interest obligations should be changed when broadcasting becomes a digital rather than an analog service.

I wish to make two major points which address that question directly.

First, it really is not even possible to have a meaningful dialogue about broadcasters' public interest obligations in the digital age until we all move beyond the extremely general and, I am afraid, rather superficial discussion which has characterized the debate to date. I ask the Committee to delve deeply into the business and technological realities of digital broadcasting, attempt to understand what digital broadcasters will actually be doing in this new era and only, thereafter, grapple with any specific changes to the public interest obligations. The stark business reality is that each and every broadcaster will spend millions of dollars to convert from analog to digital, but only one of three likely business models holds out any business prospect to support a discussion of changes to public interest obligations. The simulcast model -- broadcasters transmitting essentially the same programming simultaneously in analog and digital format -- entails increased costs with no matching revenue and offers no reasonable basis for changing public interest obligations. The pay services model -- broadcasters supplementing one free, over-the-air broadcast service with additional subscription based services -- triggers an obligation to pay fees to the government in accordance with the Telecommunications Act of 1996 but, again, affords no basis for additional public interest obligations. Only the multiple free, over-the-air broadcast services model -- broadcasters providing as yet undefined additional free services over an indeterminate number of channels during as yet unknown day parts -- creates a theoretical basis for considering changes to public interest obligations. However, it is premature to change the public interest regulatory structure based on this model because of the limitations and uncertainties associated with it. For the foreseeable future, broadcasters must retain the flexibility to offer a single channel of free HDTV. Therefore, it would be unwise to attempt to change the public interest regulatory framework based on a business model which may not be viable. The debate we are having must be grounded in these realities.

My second principal point is that any recommendations which the Committee may make regarding changes to the public interest obligations should be guided by the principles of breadth, inclusiveness, flexibility and innovation. For example, if a broadcaster determines to run a free, all news broadcast service, that should be counted as fulfilling any altered public interest obligation. It is imperative that broadcasters not be hamstrung by new, narrow, quantitative, "one size fits all" public interest

obligations. Digital broadcast technology is in its infancy. It would be extremely unwise to write specific public interest obligations into narrow, inflexible regulatory language without knowing much more about how this marvelous technology will develop and how its potential to serve the public interest might be most wisely tapped. Rather, a broad public interest mandate that encourages innovative and creative approaches that meet the needs of the viewing public should be favored.

BROADCASTERS' PUBLIC INTEREST RECORD

Service to the community at both the national and local levels is the very essence of broadcasters' public interest obligations. Right now -- today -- NBC's owned and operated local broadcast stations devote approximately 30 percent of our air time to regularly scheduled national and local news and qualifying children's programming. On a national level, broadcast networks deliver news, information and public affairs programming that informs people about important events and trends affecting their lives as American citizens. A significant portion of weekly regularly scheduled programming offered by the three traditional networks is devoted to national community service. During an average week, 30 hours programmed by the NBC network are news, information or qualifying children's programming. Both the Today Show and the Nightly News provide NBC network viewers with 2 summary and distilled description of the most important international and national news events breaking on a daily basis. Programs like The Today Show and Dateline supplement these news offerings with human-interest stories and investigative reporting that encourages and illuminates public discourse on controversial issues. These popular programs educate and engage, often providing information to enable consumers to make informed choices. For example, Dateline recently aired segments on the hidden dangers of a popular household item, torchiere-style halogen floor lamps, and important safety tips on what consumers need to know to read correctly the dates stamped on food products. The Today Show recently featured a segment on how to select a qualified babysitter in light of the Louise Woodward trial. By integrating the impact of major news events into the daily experiences of Americans across the country, these shows perform an important public service.

NBC also airs quality children's programming for three hours on Saturday morning. Through this programming, NBC focuses on pre-teens and teenagers who are often faced with serious challenges at a relatively young age. Pivotal issues like peer pressure, violence in school, drug use, interpersonal skills, gender, racism, and the significance of education are themes addressed in the Saturday morning shows Saved by the Bell, Hang Time and City Guys. These shows, developed in consultation with educational and behavioral experts, help children examine difficult issues and formulate positive responses to them.

On a periodic but recurring basis, broadcast networks provide extensive, live coverage of significant national political events. NBC and other networks cover every aspect of the Presidential campaigns, including the Democratic and Republican Party conventions and carry live the Presidential debates. Every year, the State of the Union message and the response of the opposition party are carried live during primetime,

followed by lively commentary highlighting issues of relevance to the nation. This coverage supplements the extensive regular coverage important political events and figures enjoy on weekly shows like Meet the Press, which has the distinction of being the longest running show on network television. This preeminent, hour-long political talk show, called the "fifty-first state" by President Kennedy, has provided the thoughtful exchange of political ideas for fifty years. Shows comparable to Meet the Press have made government more accessible to all Americans by bringing influential governmental officials and world leaders into their living rooms on a weekly basis.

Broadcast networks also serve a vital, national unifying function by providing continuous coverage (preempting regularly scheduled programming) of events which profoundly affect the national well-being, e.g., The Challenger disaster, the Persian Gulf War, and the Oklahoma City bombing. When events of this importance occur, they become the priority for the NBC network. This type of unparalleled coverage enables all viewers simultaneously to experience, contemplate and understand historic events that define us as a nation and as a people.

Finally, broadcast networks serve the public interest nationally with Public Service Announcements. NBC's award winning "The More You Know" campaign conveys advice to citizens, especially young people, about how to cope with social problems of national scope, e.g., drinking and driving, violence, sexually transmitted disease, and the importance of family. These announcements feature NBC celebrity role models in an effort to reach viewers and encourage them to engage in responsible behavior.

LOCALISM

Community-based television stations operate under the guiding principle of localism, another vital aspect of broadcasters' public interest. Broadcasters serve the public interest as integral members of their local communities, providing uniquely-tailored community service functions. Regularly scheduled news, weather and traffic programming in the morning, mid-day and early evening provides viewers with up-to-the-minute information about their communities helpful to planning for and getting through the day. For example, commuters rely on up-to-the-minute traffic reports and information regarding commuting alternatives, while schools rely on local television stations to inform parents of school cancellations due to severe weather conditions or school closings due to unfinished ongoing repairs, like those experienced here in Washington, D.C.

Broadcast coverage of local political events, such as congressional, mayoral and school board elections, local civic events and news specials focusing on community problems and issues, heighten community awareness. Broadcast stations have been central in both building their communities and increasing the sense of community because it is typically through them that most Americans learn of and then participate in community events and activities.

In addition to their day-to-day assistance, local broadcasters serve a life

saving function through extended live coverage of natural disasters, e.g., hurricanes, snowstorms, floods, earthquakes and public safety crises, e.g. contaminated food or water supplies. Local broadcasters work in tandem with police departments, fire departments, health departments, and hospitals and nonprofit organizations to provide information vital in times of emergency: locations of safety shelters; road closings; and the availability of medical assistance. It is often in these times that other lines of communication are unavailable, and local broadcast stations fill the void. Often in conjunction with relief organizations, local broadcasters subsequently lead the way in community rebuilding efforts in the aftermath of tragedy. Again, at these critical junctures, broadcasters perform a unifying function, this time at the local level, by galvanizing the communities they serve to undertake charitable activities, such as donations of food, clothing and money to help their neighbors.

THE GENIUS OF THE PUBLIC INTEREST STANDARD IS ITS BREADTH AND FLEXIBILITY

The breadth and flexibility of the public interest standard has yielded a great deal of good over the last sixty years because it has enabled broadcasters to respond to the needs of their audience -- both nationally and locally -- and to the changing conditions of society. Indeed, the guiding principle of localism impels broadcasters to meet the diverse needs and interests of each community served whether they be rural or urban, heavily minority and ethnic rich populations, farming communities, or religious communities.

The breadth and flexibility of the public interest standard also enables broadcasters to program in a way that is meaningful to viewers, enabling broadcasters to reach and engage a broad audience in the community. "Public interest" programming watched by virtually nobody does absolutely nothing to promote the public interest. In contrast, programming such as NBC's "Schindler's List" conveys enormously important historical information to a huge number of Americans and thereby serves "the public interest." The current flexible approach to what constitutes programming in the public interest promotes maximum innovation, diversity, and service to communities and should be encouraged, not thwarted. It must remain an integral element of the public interest responsibilities of broadcasters as they move into the digital era.

THE CURRENT DEBATE

There is a consensus that broadcasters should continue to serve the public interest in the digital era. As they have in the past, broadcasters continue to be committed to providing free, over-the-air programming serving their communities. While governmental mandate and technological advancement are propelling broadcasters into the untested territory of the digital era, their commitment to discharge public interest obligations in a manner that best suits the communities they serve will not be diminished or compromised. Therefore, the only questions are whether and how the regulatory definition of public interest obligations should be changed.

To answer these questions wisely, there is a need for all interested parties

to reason together to develop a common understanding of the possibilities and limitations of digital broadcasting as they relate to public interest obligations. There is nothing inherent in digital technology which suggests there should be a change in the current public interest standard. Although the promise of digital television is tremendous and near at hand, many challenges and risks are still ahead. At a most fundamental level, digital broadcast technology is so new that we lack genuine understanding of exactly what the service will be or how it will evolve. It is still unclear what the range of potential uses for new digital capability will be, much less what audiences will want. There is no need to rush to judgment. Above all else it would be a

mistake to recommend a series of specific, narrow regulatory requirements which would limit artificially the potential of digital technology to serve the public interest while hobbling broadcasters' ability to compete in the digital future with unnecessary additional burdens that do nothing to promote the public interest.

BUSINESS REALITIES

The transition from analog to digital transmission technology is not optional for broadcasters if they want to remain in business. It is mandatory, both as a legal matter and as a marketplace reality. Congress and the FCC have given broadcasters a clear ultimatum: either they convert their existing analog television stations to digital, or be prepared to cease analog operations in 2006 without means of continuing their broadcasting services. While some flexibility has been given to the FCC to re-evaluate the surrender date, the broadcast industry must transition from analog to digital if it is going to stay competitive with the cable, satellite and telephone industries all providing video services digitally.

The digital television imperative is not only driven by law; it is also driven by the marketplace. The video marketplace generally is already in transition from analog to digital. The blurring of the lines between computers, television receivers, and other video devices is now a marketplace reality. Numerous provisions of the Telecommunications Act of 1996 tore down barriers to entry between previously distinct and compartmentalized sectors of the communications marketplace. By allowing telephone companies to provide video programming services in their service areas and allowing cable television companies to provide telephony, the Congress created the predicate for a vastly more competitive multichannel video programming market. Satellite direct-to-home digital video is now available to consumers, and the cable television industry rapidly is entering into partnerships with computer companies to jump-start its transition to digital. Inevitably, broadcasters must embrace digital or suffer extinction due to technological obsolescence -- becoming the dinosaurs of the video marketplace.

A successful transition for broadcasters will be enormously costly in terms of both financial and human resources. The broadcasting industry and television receiver manufacturers have invested more than a half of a billion dollars into the research, testing and development of digital broadcasting. NBC has already expended more than \$55 million on

creation of digital studio facilities at its headquarters in New York. Each local television station will have to spend a minimum of \$2 million just to pass through a digital network feed. The cost of a complete conversion to full digital transmission capability, including the addition of digital origination capabilities at each local station -- both remote news-gathering equipment and studio equipment -- is likely to be closer to \$10 million per station. In addition, a new generation of broadcast engineers and technicians must be trained in the new sciences of digital production and transmission.

All of these costs are amplified by the obligation to keep two full transmission systems operating simultaneously during the analog-to-digital transition -- the new digital system transmitting to new digital TV sets as they become available to consumers, plus our existing analog transmission system continuing to serve the current generation of analog TV sets. Clearly, it is uneconomical to transmit both analog and digital any longer than is absolutely necessary to ensure a seamless transition for American consumers. Thus, NBC has and will continue to play a leading role in driving the conversion to digital.

In addition to these predictable costs of conversion, digital broadcasting still faces many significant technical challenges which may increase costs and jeopardize station revenues even further. As we are in the midst of moving from the development and design phase to full-scale, real world implementation, interference problems will challenge local broadcasting stations to meet their service goals. These technical challenges may require substantial and costly engineering resources and technical innovation to accommodate and compensate for the severely crowded conditions of the spectrum allocated for digital television use. Moreover, though the broadcast industry is committed to an aggressive build out schedule in a concerted effort to expeditiously bring the wonders of digital television to all Americans, tower siting and construction problems, including local zoning issues and a general shortage of expertise in tall-tower construction, may cause delays and create additional expenses.

The Committee should remain mindful that the full panoply of these costs must be borne by television stations in markets of all sizes. It is a sobering fact that the costs of full digital conversion are estimated to exceed a small-market station's entire annual cash flow more than five times. While these stations are permitted to "go last" in the digital transition, the aggregate economic burdens for these stations are not likely to be substantially less.

Accompanying the high cost of the digital transition, are many competitive pressures and marketplace uncertainties. First and foremost there is absolutely no promise of increased revenues for broadcasters as a result of the investment in digital facilities to offset the high cost of conversion. Broadcasting -- whether analog or digital -- is dependent on advertising revenues. Indeed, it is quite possible that further audience fragmentation may result from the conversion to digital, much to the detriment of advertising revenues for broadcasters. Moreover, broadcasters must make this investment at a time when the level of competition for viewers and advertising dollars has intensified beyond

what anyone could have predicted even 10 or 20 years ago. Furthermore, programming costs, from sports rights to bidding for entertainment shows and talent, to the costs of news programming and news correspondents and anchors, are skyrocketing. Under these circumstances, this digital investment may result in nothing more than keeping pace with our competitors without a dime more of new revenue.

While no one is shedding crocodile tears for the broadcast industry, it should be recognized that digital broadcasting will be subject to all of the problems and uncertainties of a start-up business. As broadcasters, we do not shrink from this challenge. We are optimistic that, as we enter the digital world, we will be able to develop new and innovative ways to utilize the unique capabilities that digital transmission will provide. But, as we sit here today, each member of the Advisory Committee should understand that the business uncertainties associated with risking investment capital on developing these new capabilities into services that consumers will seek out and that advertisers will pay for are overwhelming.

BUSINESS MODELS FOR DIGITAL BROADCASTING

Of the three most realistic business models for digital broadcasting, only one even theoretically holds out any reasonable business prospects for discussing a changed framework for broadcasting's public interest obligations, and, in that case, any such possible change would be premature. The first of these models involves a situation where a broadcaster simulcasts in digital format its program schedule transmitted over the analog channel. During the past decade, the television industry, including broadcasters, production studios and TV set manufacturers, the Congress and the Commission, carefully crafted and committed to a plan for viewer-friendly conversion to digital television which featured simulcasting of analog and digital signals and presumed a substantial amount of true High Definition Television ("HDTV"). While the final FCC rules provided broadcasters with some flexibility to depart from this model, it remains the approach with which broadcasters are most familiar. To the extent broadcasters replicate their current free, over-the-air broadcast service, there is no change in the programming or economic structure of the business to warrant a changed regulatory framework. Under this scenario, today's network programming would be supported by advertisers and would be broadcast digitally. There is no reasonable, near-term prospect for increased advertising revenue associated with this model, and there is no change in material broadcast to suggest a need for changed regulation.

The second of the three most likely business models for digital broadcasting involves use of digital transmission capability to provide supplementary subscription-based services. Like the first model, this approach would involve today's basic channel of free, over-the-air broadcast services transmitted digitally, supplemented by "pay" services for which viewers would be charged. The Telecommunications Act of 1996 established a defined structure for how the government would realize value from broadcaster-provided subscription-based service using digital transmission: the payment of fees to the Federal government. These fees

would be pegged to what the government might have realized from the auction if spectrum used to provide comparable subscription based services to consumers. There is nothing in the 1996 Act or elsewhere which suggests the public interest obligations could or should substitute for these fees relating to subscription services. Moreover, regarding the basic network channel of free, over-the-air programming to be broadcast in this second model, again there is no difference in the economics of this offering and an analog broadcast of the same programming. As with the first model, there is no expectation of increased advertising revenue to support the free, over-the-air component of this service, and no other change in the programming/economic structure of the business to give rise to a different regulatory structure.

The use of digital technology to provide multiple, free, over-the-air broadcast services is the one foreseeable business model which might justify a realistic reappraisal of the regulatory framework governing public interest obligations. Programming multiple channels with free, over-the-air standard definition television broadcast services has the potential to generate increased advertising revenue. However, this business model is filled with limitations and uncertainty. When a digital broadcaster is transmitting HDTV, there is insufficient spectrum to offer additional channels of programming. Even when a broadcaster is not transmitting HDTV, there is no current business scenario which would suggest this approach. The broadcast of multiple over-the-air broadcast services would entail the potential for further audience fragmentation, already a major problem for broadcasters competing against the cable operators and-DBS providers offering hundreds of channels of programming. That problem might be compounded ironically because a broadcaster might be competing against itself for audience share. Finally, any additional channels of free broadcast programming probably would operate only part of a broadcast day.

In view of these uncertainties, broadcasters must retain the flexibility to offer (or revert to) a single channel HDTV service. Therefore, it is premature to change the public interest regulatory structure based on the concept of multiple, free broadcast services when it is unknown whether this business model will ever prove viable.

GUIDING PRINCIPLES

Analysis of these business models for digital broadcasting indicate that only the last one, the offering for all or part of a programming day of multiple channels of free, over-the-air broadcast services, offers any reasonable business prospect for discussing a changed framework for public interest obligations. Within that context, the Committee should be guided by the principles of breadth, inclusiveness, flexibility and innovation in recommending enhancement of public interest responsibilities. As in the past, broadcasters should be afforded the latitude to develop and offer programming best calculated to meeting the needs of the communities they serve. For example, broadcasters dedicating an additional channel for an all news or all weather program service should receive full credit for fulfilling additional public interest responsibilities. Similarly, broadcasters dedicating an additional channel to serve the

unique needs and interests of minority or ethnic populations also should receive full credit for achieving additional public interest obligations. The same is true for new programming services focusing on the unique economic base of a community such as agriculture or high tech industry.

Conversely, public interest obligations should not be limited by particular subject matter that may be popular currently. For example, the universe of public interest obligations should not be bounded by free time for political candidates or more children's programming. While such programming also may count to satisfy changed public interest obligations, it certainly should not be the exclusive or even the favored means of doing so.

It also is critically important that new means of fulfilling public interest responsibilities through innovations in digital technology should be left open. We are just at the threshold of the age of digital broadcasting. We have not even begun to explore the myriad capabilities which digital technology could give to broadcasters to enhance their public interest services. New services such as data broadcasting and certain interactive applications may well yield major public interest benefits. Supplementary data accompanying news and public affairs programs could greatly enhance the informational and educational value of the programming contributing to a better informed electorate and enhanced opportunities for children. The Committee should permit digital broadcasting to develop more fully before imposing any specific public interest obligations which could inadvertently limit its potential to serve the public good.

CONCLUSION

If the Committee follows these guiding principles in its deliberations and recommendations, it truly will have performed a valuable public service. It will have built upon the proud historical tradition of broadcaster fulfillment of their public interest obligations through serving their national and local communities. It will have resisted successfully the temptation to embrace one or more causes or notions currently in vogue in favor of a broader and more enduring concept of the public interest. Finally, it will have allowed digital technology to flourish and reveal its full potential for enriching the public interest service provided by broadcasters.

HOME



D. Innovative Approaches to Public Interest Respon- sibilities: A Comparative Analysis

Innovative Approaches to Public Interest Responsibilities: A Comparative Analysis

The purpose of this appendix is to offer some discussion of various possible innovative approaches to public interest obligations, and to compare them to more conventional approaches.* Our shared ground is that broadcasters should attempt to contribute to the educational, civic, and democratic goals of a well-functioning democracy. The question is what methods are best suited to achieving those goals and whether it is possible to think of more creative means for doing so. Thus we discuss a wide range of proposals, from deregulation to spectrum auctions to a system of "digital drop-ins," by which government would support a substantial amount of public interest programming.

Some of the most interesting proposals below attempt to promote public interest goals by allowing considerable flexibility for broadcasters, as, for example, by allowing them to provide public interest broadcasting or instead to pay for someone else to do it, or by paying a spectrum fee (from an auction or from a set price) that might be used to support public interest broadcasting.

We have been greatly assisted by a number of presentations and documents, including those by the Media Institute, a working group of the Aspen Institute, and Hugh Carter Donahue. The public through electronic mail submissions, faxes, and attendance at meetings has also made substantial contributions to the Committee. We are very grateful for the creative thinking and assistance provided by these organizations and individuals. These ideas were vigorously debated within the Committee. Given the innovative and new approach taken by many of these proposals, the Committee chose not to reach any final judgment and conclusions or make any specific recommendations.

I. TRADITIONAL REGULATION: THE PUBLIC TRUSTEE MODEL

The traditional approach to regulation of broadcasting has treated broadcasters as public trustees, obligated to meet a large set of public service responsibilities. Because broadcasters get exclusive use of a scarce public resource—the airwaves, it has been deemed appropriate to subject them to national commands designed to ensure promotion of the public interest. Perhaps the public trustee model should be "carried over" to the digital era, though there are complexities in deciding exactly how the model applies in a new setting. There are serious questions about the extent to which federal commands should be specific (so as to ensure compliance) or vague and general (so as to allow room for private adaptation).

* The Advisory Committee thanks Angela Campbell and the Aspen Institute's Communications and Society Program directed by Charles M. Firestone and Amy Korzick Garmer for the submission, *Toward a New Approach to Public Interest Regulation of Digital Broadcasting: A Preliminary Report of the Aspen Institute Working Group on Digital Broadcasting and the Public Interest*, on which this Appendix is based.

Advantages: It is reasonable to think that direct mandates are the simplest way to ensure compliance with public interest responsibilities. If, for example, broadcasters are told to provide three hours of educational programming per week, or five hours of free air time for candidates per year, the public interest may be well-served simply by virtue of the mandate. Other approaches might be easier to evade and less effective.

Disadvantages: In general, this approach may be anachronistic in light of the new communications market, with so many more options. As historically understood, the public trustee model also has a degree of rigidity—a kind of “one size fits all” notion that is ill-suited to varying needs on the part of stations and viewers alike. Command-and-control approaches can also be counterproductive and have unintended bad side-effects.

II. ECONOMIC INCENTIVES: PAY OR PLAY, SPECTRUM CHECKOFF

In the environmental area, there have been many innovations designed to create efficient, or low-cost, ways of promoting regulatory goals. A creative illustration consists of “emissions trading,” by which polluters are given a right to pollute a set amount, and permitted to trade that right with others.¹ The basic idea is that pollution is a public bad, and therefore people should be able to save money from doing less of it (and in that way lose money from doing more of it). If the right to pollute can be traded, there will be strong incentives to come up with low-cost ways of reducing pollution, and the result should be a system in which we obtain pollution reductions most cheaply. Existing experience with emissions trading approaches have shown many advantages.²

This basic approach—using economic incentives—might be adapted to the area of public interest programming. Indeed, the Children’s Television Act now authorizes licensees to meet part of their obligation to children by demonstrating “special efforts . . . to produce or support [children’s educational] programming broadcast by another station in the licensee’s marketplace.”³ The idea might be generalized. Suppose, for example, that public interest programming is considered to be a “public good,” in the sense that the public is better off with more of it. Suppose too that some broadcasters are good at providing such programming, and can do so in a cost-effective manner, whereas others are not so good at it, and can do so only at great expense. Adapting the environmental law model, it might be provided that broadcasters should have a choice: provide public interest programming of a certain defined level; or pay a certain amount to someone else who will do so.

A mild variation on this approach would involve what has been called the “spectrum check-off” model. On this model, broadcasters are given a choice: adhere to public interest responsibilities as nationally determined; or pay a fee for the use of the spectrum. The payment would be used for public broadcasting of one kind or other. This approach is somewhat less fine-tuned, and somewhat simpler, than the “pay or play” model. Under “spectrum check-off,” there is only one “deal,” whereas under “pay or play,” there could be a number of trades every year.

Advantages: This approach might ensure a high level of public interest broadcasting, and do so in a way that ensures that such broadcasting will be provided by those most willing and able to do it. Thus the "pay or play" approach might combine the virtues of the public trustee model with the virtues of deregulation. Under this approach, people who do not want to provide public interest programming, or who can do so only at great expense, can make mutually beneficial deals with others who are willing to do so. This could serve both broadcasters and the public.

Disadvantages: In the environmental area, emissions trading does not work where it creates "hot spots," that is, areas that are highly polluted. A problem with "pay or play" is that it may result in the failure, on the part of some or many broadcasters, to do anything but "pay," with the consequence that many viewers do not see such programming—and with the further consequences that broadcasters who provide such programming may be hurt in the marketplace. In addition, there are symbolic and expressive values to uniform public interest obligations. Some people think that these obligations should apply to everyone and that no broadcaster should be allowed to buy its way out.

III. PAY PLUS ACCESS

Under this approach, broadcasters would pay a fee for a right to use the spectrum; the fee might be determined via auction or might be determined by government. At the same time, public interest obligations would be removed. In addition, broadcasters would be asked to allow a specified amount of programming in the public interest—in other words, to set aside an identified amount of time for political candidates, educational programming, or diverse viewpoints. It would be possible to imagine various combinations of the three ingredients of this approach: payment, relief from general public service obligations, and access.

Advantages: As compared with economic incentives, this approach would tend to ensure that some public interest programming was on every station. Many people think that this is important—that certain programming, for example candidate speech, should not be relegated to certain channels that are rarely watched. Thus this approach might do better in serving democratic goals. As compared with the public trustee model, this approach would better ensure that people will provide public interest programming who have the incentive to do so well.

Disadvantages: For those skeptical of "pay or play," this approach might create similar problems. It also would involve a degree of administrative complexity. It is possible that people would simply change the channel when the "access" material was on the station.

IV. DISCLOSURE OF PUBLIC INTEREST AND PUBLIC SERVICE ACTIVITIES

We have emphasized the importance of disclosure of public interest and public service activities. It would be possible to think that disclosure should be the exclusive governmental mandate, and that the market should be used for all specific decisions. Perhaps, then, government should restrict itself to a disclosure requirement.

Advantages: Disclosure might well trigger public-interested reactions on the part of broadcasters and diverse segments of the public. In the environmental context, disclosure has by itself done enormous good in terms of achieving low-cost pollution reductions.⁴ The same may well be true here. If broadcasters are required to disclose their public interest activities, there may well be a kind of competition to have more such activities, and to create a kind of "race" to do better. Moreover, disclosure is a minimal mandate, not by itself requiring anything. Perhaps what emerges from the market, influenced as it is by the pressures that come from disclosure, is best for society, especially in light of the increasing range of programming options.

Disadvantages: In advance, it is impossible to know how much good would be done by disclosure on its own. Perhaps the good results in the environmental area will not be replicated here. If disclosure by itself has few effects, there is insufficient reason to think that whatever results is necessarily "best." Disclosure may, in short, be too close to deregulation.

V. SPECTRUM AUCTION WITHOUT PUBLIC INTEREST OBLIGATIONS

The FCC has experimented with an auction approach to allocating scarce communications resources. It would be possible to suggest that instead of being required to pay a "fee" for spectrum, to be set by government, broadcasters should receive licenses via any auction, where the market would set the relevant prices. The proceeds from the auction could be used however the taxpayers see fit.

Advantages: It is usually better to have the market, rather than government, set the fees for goods and services. And if deregulation is an appropriate solution, a spectrum auction might well be part of a complete deregulatory package, in which broadcasters purchase "space" (at market prices) and then supply the relevant goods (also at market prices).

Disadvantages: Operation of so general an auction could be somewhat complicated. Some people believe that there would be serious questions of equity if digital "space" were put up for sale anew, especially in light of various investments that have already been made. Most important, this approach is unacceptable if the case for deregulation has not been made out. If, for example, there are various forms of market failure, it is reasonable to think that broadcasters should provide more public interest programming than the market guarantees (see below).

VI. COMPLETE OR NEAR-COMPLETE DEREGULATION

One possible approach, explicit in some of the suggestions that we have received, is to eliminate any public interest obligations. It might be thought, for example, that the market for communications is providing sufficient services for everyone, and that serious constitutional questions are raised by any governmental control of programming content. Even if the constitutional questions are not so serious, perhaps this form of government intrusion into the editorial discretion of broadcasting stations is no longer acceptable.

Advantages: Perhaps deregulation could do as well as any other approach at ensuring that viewers see what they want to see. It would certainly save money and reduce administrative burdens for broadcasters, a fact of general importance for the industry and of particular importance for many small and local stations. In light of the broad availability of options—including cable—it might be thought that there is no longer any reason for government control of content. On this view, any public interest programming should be funded by taxpayers, to the extent that they are willing to do so; broadcasters should not be required to pay for that programming on their own.

Disadvantages: There is good reason to believe that the communications market will not meet all social needs. Many people do not have cable television at all, and they rely instead on broadcasting. The market for broadcasting may well underproduce educational programming for children, and also programming relating to elections and other democratic concerns. There are large “external” benefits from such programming, and individual viewers may not adequately take account of those benefits in individual choices.⁵ The fact that advertisers are involved in determining program content suggests that the communications market is not an ordinary one; since broadcasters deliver viewers to advertisers—since viewers are in this sense commodities rather than consumers—it is not at all clear that the communications market will simply provide viewers what they “want.”⁶ In any case people are citizens as well as consumers, and they may well, in their capacity as citizens, want broadcasters to produce more public interest programming than the market produces on its own. And if broadcasters are receiving licenses for free, it makes sense to say that they should be required to provide something in return.

VII. DEREGULATION WITH LICENSING FEE, WITH PROCEEDS DEVOTED TO PUBLIC INTEREST BROADCASTING

Some people have suggested that government should deregulate the market, and allow broadcasters to show whatever they wish, but that it would be appropriate to impose a licensing fee, the proceeds to go to public interest broadcasting. Of course the licensing fee might be established via auction.

Advantages: Like the deregulation option, this one would eliminate any government control of the content of broadcasting. But it would impose a quid pro quo: broadcasters would have to pay a certain amount as a licensing fee, with the proceeds to go to public interest broadcasting on, for example, PBS.

Disadvantages: Like the deregulation option, this approach may well produce too little educational viewing for children and too little attention to democratic and civic affairs. It is risky to leave all public interest obligations with PBS; our tradition has sought to impose minimal duties on all stations who receive broadcasting licenses.

VIII. DIGITAL DROP-INS IN THE PUBLIC INTEREST AND THE QUESTION OF "RESERVING" PUBLIC INTEREST "SPACE"

It has been suggested that when the 1600 channel analog television system becomes obsolete, some part of the spectrum should be specifically reserved, by government, for civic discourse or local and public affairs programming. The networks that produce such programming might be funded by money received from auctioning off a portion of the analog stations. The basic idea would be to ensure "space" for public broadcast stations that would serve civic aspirations. These stations could in turn develop relevant expertise and obtain niche markets, as for example, C-Span has done.

Advantages: This approach would involve little control of commercial broadcasters. At the same time, it would ensure a large level of civic and democratic programming. The goal would be to use new technologies to expand on the PBS model, creating a number of "little," and private, public stations.

Disadvantages: If it is desirable to ensure a certain level of public interest programming on all stations, this approach will be inadequate. There are also questions about the extent to which it is appropriate for government to reserve "space" for programming of a specific content, and about how strong a role government might have in overseeing those stations.

ENDNOTES

¹ See Ackerman and Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333 (1985).

² See *id.*; Robert Stavins, *What Can We Learn From the Grand Policy Experiment? Lessons from SO2 Allowance Trading*, 12 J. ECON. PERSP. 69 (1998).

³ 47 USC 303b(b)(2).

⁴ See JAMES HAMILTON, *CHANNELING VIOLENCE* (1998).

⁵ See C. Edwin Baker, *Giving the Audience What It Wants*, 58 OHIO STATE L.J. 311, 352-83 (1997); see also JAMES HAMILTON, *supra*.

⁶ See C. EDWIN BAKER, *ADVERTISING AND A DEMOCRATIC PRESS* (1994).

Defining Vision by Joel Brinkley

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That autumn afternoon, Abel was a relative newcomer to the NAB. The seeds of the organization's crisis had actually been sown more than a decade before, while Abel was still teaching classes at Michigan State University.

HDTV . . . Maybe that's it! 5

In the 1960s and 1970s, the leaders of the three television networks stood confidently in positions of unparalleled importance. Did the president of the United States wield greater influence over public opinion than the men who decided whether *Guns, Smokey*, or *60 Minutes*, would return for another season? Even their office towers in midtown Manhattan were American landmarks: Rockefeller Center, Broadcast House. And the top-floor executive suites were the regally appointed homes for the Broadcast Barons, the royalty of America's new, electronic age.

Across the country, meanwhile, the families that owned the television stations carrying those network shows had long ago learned that they had only to sit back and smile as the profits poured in. These people had grown to be community leaders of the first rank—heads of the arts commissions, directors of the United Way campaigns. They held forth from offices that were proud downtown monuments, just around the corner from city hall. Their satellite-TV trucks sallied forth across town, greeted everywhere they ventured almost as if they were official city vehicles.

Out of all that, their appointed representatives in Washington, the lobbyists at the NAB, had grown fat and comfortable. Their royal clients held official licenses to print money—permits that were well protected by their own special agency of government, the Federal Communications Commission. Everybody was getting rich; everyone was happy.

But then the *Mongols* began pounding at the gates. Cable TV.

In 1976, barely 15 percent of American homes were wired for cable, and to the broadcasters then, the cable operators were irritating, oafish figures. They seemed to favor polyester. They worked out of buildings with corrugated metal walls somewhere out there by the warehouse district. Bluntly put, these people were parasites. They offered no shows of their own; they simply sucked up the network programs and sent them out over a wire. To the local broadcasters, these were people of a decidedly lower caste. Nonetheless, as the 1980s dawned, Americans began falling in love with cable and its promise of interference-free TV pictures and vast new selections of programming. Cable offered an escape from the tyranny of the networks. As more and more homes hooked up, ever greater numbers of viewers were choosing ESPN or the Movie Channel during prime time, instead of *Love Boat* or *LA Law*. Marilyn Chambers or Linda Lovelace late at night, instead of Johnny Carson or *Matlock*. The Broadcast Barons watched, helpless, as their profits and

power began to slip away. Do something! they pleaded. But it wasn't so easy.

With every new cable hookup the broadcasting industry lost a few more drops of its lifeblood. Some of the broadcaster lobbyists in Washington began to imagine one of those giant plywood thermometers out in front of the cable television headquarters just across town, but this one wasn't there to show how well the United Way campaign was going. No, in the lobbyists' minds, the bright red fever line inching up day by day showed how many American homes were unhooking their TV antennas and plugging in the cable instead: 19 percent in 1979, 28 percent in 1981. *Forty-three* percent in 1984.

Then in 1985, the Cable Mongols won a decisive battle. A federal appeals court ruled that cable systems were no longer required to carry broadcast television programming at all. That meant the cable companies could simply choose not to transmit all those programs the Broadcast Barons worked so hard to produce—along with all those commercials they struggled even harder to sell. Right away several cable systems threatened to drop some of the weaker stations in their communities. Who was next? Forty million households had already unhooked their TV antennas. The Mongols had guns to the broadcasters' heads.

With that the NAB seemed to be at its nadir, as everyone in Washington could easily see. Senator Bob Packwood had said it first—and while he was a guest at the NAB's own convention. Now his statement had become common wisdom in Washington: "The NAB can't lobby its way out of a paper bag."

But darker days were yet to come. Even as they lost every skirmish with the Cable Mongols, a new and even more dangerous enemy appeared.

Land Mobile.

The Cable Mongols were stealing their audience. But the way the Broadcast Barons saw it, Land Mobile was challenging their very existence. To make matters worse, the FCC was on Land Mobile's side.

The FCC's most difficult task was allotting uses for the crowded airways. Everyone wanted to transmit on this invisible highway—ham radio operators, air traffic controllers, county rescue squads, the military, radio-dispatched taxicabs, pizza delivery trucks. The list went on and on, but

there were only so many lanes: Of all these users, however, the broadcasters had the choicest space—or *spectrum*, as it was called—because these particular channels allowed long-distance transmissions with the greatest clarity. And it's no wonder: wireless, and then radio, were the first users of the electromagnetic spectrum, a hundred years ago. That's why, even today, when the airways are crowded with varied services, all of it is still known as the radio frequencies.

Now, in the mid-1980s, a new group was clamoring for space—the manufacturers and users of two-way radios. Police departments, ambulance services, commercial delivery companies. Motorola made most of these radios and led this lobby, which was known as Land Mobile. And Motorola's lobbyists were trying to convince the FCC that broadcasters had no real use for much of the choice spectrum they controlled. After all, most cities had only eight or ten TV stations at most, so fifty or more of the channels set aside for television broadcasting lay fallow. Some of those were left unoccupied on purpose, to reduce interference between adjacent channels. Still, more than half of the channels allotted for TV service in most cities were sitting idle. Why not give some of those channels to us? Land Mobile asked. By 1986, the FCC had pretty much decided to do just that. Several vacant UHF channels in ten big cities were to be taken away from the broadcasters and given to Land Mobile.

Nothing was more certain to rouse the broadcasters. Above all else, they held sacred the eleventh commandment: Thou Shalt Not Give Up Spectrum. Their assigned channels were precious electronic real estate—beachfront property, they liked to call it. They argued that mobile-radio transmissions would cause static, noise, and other irritating interference on the broadcast stations, driving even more viewers to cable.

Here was a big potential problem. And broadcasters did not like the principle of it, either. Like cattle ranchers on the western plains, the broadcasters saw themselves as the descendants of heroic frontiersmen. Their forebears—Marconi, de Forest, Armstrong, Sarnoff—had tamed this spectrum, cultivated it, and then passed it on to them. By god, it was *theirs*, and they were not about to give up any of it. Land Mobile was just the camel's nose under the tent. Let them in, and others would stream through right behind them. Pretty soon the broadcasters would have no spectrum left. And would anyone really care, once most of the

nation was hooked to cable? Truly, the broadcasters felt, their very survival was at stake.

John Abel came to be the NAB's point man for this battle, and he loved a good fight. Abel looked unimposing; he had a bushy mustache, a head of thick black hair, and a sad-sack expression when his face was at rest. But with little provocation he broke into a conspiratorial grin, for Abel was an exceedingly clever man. Some might say conniving, though he was also likable and generally honest about his intentions. Abel's special qualities certainly had not been lost on Eddie Fritts, the association's president. When he met Abel on an airplane in 1983, Fritts promptly offered him a job.

Abel, an Indiana native, had been chairman of the Department of Telecommunications at Michigan State University, but not even the intrigue of big-campus politics had been enough to keep him challenged. University life was too parochial. He had spent a sabbatical year working as a consultant at the FCC, and Washington power politics was more exciting than he had ever imagined. All of a sudden his old position seemed irrelevant. So he accepted the job at the NAB.

Abel took on Land Mobile with relish. First he did some research, found a few potentially malignant spots on Motorola's record: questions about the company's government contracts or its environmental policies. He spread that around, but the FCC didn't seem to care. When that tactic failed, Abel and the other lobbyists tried logical arguments. What about the interference? Viewers didn't want a flash of static on their TV sets every time a pizza delivery truck drove past. Land Mobile shot back that the discussion wasn't about pizza trucks. It was about ambulances and police cars. In any case, just what was this sacred programming that couldn't stand any interference? *Laverne and Shirley*? Ex-Lax commercials? So much for that pitch.

Abel was losing. Then Land Mobile repeated its most telling argument: You broadcasters aren't *doing* anything with those vacant UHF channels, and you have no plans for them. Tell us what you're going to use them for. *Tell* us! Abel and the others had puzzled and worried over that. But they hadn't been able to think of any answer at all. Now there seemed no way to stop Land Mobile. Around Abel the Broadcast Barons were asking, If we lose this one, can our industry survive?

One afternoon in the summer of 1986, Abel led a meeting of officers from the NAB and allied groups in one of the association's wood-paneled

conference rooms on the first floor of NAB headquarters on R Street in downtown Washington. Their mission: Devise one last, desperate lobbying strategy. But as Abel looked around the table he grew depressed. The mood could not have been grimmer. The lawyers and lobbyists mumbled, sighed, fidgeted in their seats, and looked down at the table. No one had a good idea. To Abel, it seemed as if everyone had already given up.

But then, out of the corner of his eye Abel happened to notice Tom Keller, the NAB's technology officer. Abel could hardly miss Keller because he was sound asleep, as he sometimes was during meetings, chin resting on his chest. Abel was Keller's boss, and as he glared at him suddenly a thought struck.

Through Keller, the NAB had been giving money to Bill Glenn, that college professor down in Florida. The sums weren't large because the broadcasters didn't really care much about high-definition television. Glenn's work was like a school science project, really. And HDTV—that was a technology of the far distant future that few of them had ever seen or really even thought much about. But as Abel stared at Keller, who was drawing long breaths as he dozed, a realization dawned: Bill Glenn's high-definition system wouldn't fit on a single television channel. If broadcast, it would fill up all of channel 3, say, and half of channel 4 as well.

Wait a minute, Abel thought, sitting up straight as an idea began racing through his head. Here's an argument. HDTV takes more channels. Land Mobile wants to know what we need those extra channels for? Well, we need them for high-definition television.

HDTV... Maybe that's it!

"I've got an idea," he told the group as a grin slowly spread. A dozen dour faces looked up. "What about high-definition television? Why don't we tell them we need all that extra spectrum for high-definition television?" The others didn't say anything at first. Quizzical expressions crossed several faces, as Abel's listeners tried to recall exactly what HDTV was. To Abel, that puzzlement was exactly the point. Land Mobile probably hadn't ever considered HDTV either.

"They'll *never* have thought of this," he said, looking around the table with that conspiratorial grin. "It'll really take them by surprise, put them on the defense. And it's a positive argument, not negative." The broadcasters could offer the lofty idea that they needed all that extra spectrum so they could *bring HDTV to America*.

Slowly, cautiously, some of the others began to nod. It just might work. They certainly had nothing else. Then one of them stopped short as he thought ahead.

"Yeah, but what if we actually *get* it?" he asked. It was obvious that broadcasters would have to spend quite a lot of money if HDTV ever became a reality. They would have to buy new high-definition cameras and recorders. They would need monitors, transmitters . . . the works. Some of them might have to shop for a new TV tower. All of that would cost millions, and where would they get the money? Stations wouldn't be able to sell more advertising just because the ads were broadcast in high definition. Ad rates couldn't be raised just because the detergent boxes showed up better. All that and more ran quickly through some people's minds, but they brushed it off. They had a problem *now*. HDTV . . . that was years away, maybe even decades. Hell, some of them figured they'd probably have retired or died by the time high-definition television was on the air. Finally Abel said, "Finding something that works *right now* is more important than where we end up." The discussion moved ahead.

"We've gotta have a strategy," Abel said. "We can't just tell them; we've got to show them." He turned to Keller; with all the commotion, he was awake now. Tom, he asked, can we get Bill Glenn up here for a demonstration?

Keller shook his head. "I don't think his system's ready yet."

Abel wasn't really surprised. From what he'd heard about Bill Glenn's machine, it sounded like "a baling-wire kind of thing." Still, he said, maybe we'd better go down and have a look. But if Glenn's system wouldn't do, where else could they get an HDTV system to put on display?

Across the table, Greg DePriest was listening with a bemused smile on his face. DePriest was a vice president of the Association for Maximum Service Television. This group had a small office suite a few blocks away, where six employees worked on behalf of their broadcaster members to keep ahead of technological developments in television. DePriest had been watching the progress of HDTV with more interest than the others at the table; this fell squarely within his organization's charter. He knew full well that the Japanese already had an HDTV system up and running. They had cameras, transmitters, TV sets, and VCRs—everything. In fact, DePriest had been talking with NHK, Japan's public broadcasting network, about putting on a demonstration in the United

States. The idea had been to make sure that broadcasters remained competitive. What would happen if the Cable Mongols started offering high-definition television before broadcasters were able? Another disaster. Cable would need all the new equipment, too. But unlike the broadcasters they wouldn't have to get permission from the government to broadcast HDTV.

The talks with the Japanese had been largely theoretical; DePriest's organization didn't have the money or wherewithal to stage a big public demonstration. DePriest had been thinking about asking the NAB for help, but the two groups didn't get along very well. In DePriest's view, Abel and the others looked down their noses at his little organization. He found it so unpleasant to work with them, and he hadn't quite gotten around to asking. Nonetheless, he spoke up now: "What about NHK? We've been talking to NHK about doing a demo. They could do it." NHK's system needed more than one TV channel, too.

That's a possibility, Abel said.

They talked through the idea some more and finally concluded: We have a strategy. The meeting adjourned, and now Abel had to decide on the best way to carry it out. A short time later, he and Keller took their trip down to Fort Lauderdale.

Even before Abel left Glenn's cinder-block lab, he had concluded that the professor's system simply would not do for the extravagant show he was planning. It didn't take much to imagine the senators, congressmen, and FCC commissioners seated expectantly in front of that little TV monitor, noting the fat cable that snaked away from the back of the set. As the picture came on, the honored guests would follow the cable with their eyes until they spotted that prototype camera, the gutted fish with the wires hanging out, focused on the Toys "R" Us ballerina—or maybe on the traffic outside the window.

Abel turned to Keller and said, "Call the Japanese."

The Japanese engineers first had to make some modifications so that Muse could be sent over the air from a TV tower instead of from a satellite, as originally designed. The NAB enlisted the help of WUSA, the CBS affiliate in Washington. The Japanese would set up at the station and use WUSA's tower for the broadcast. The NAB, meanwhile, filed an application with the FCC to use two UHF channels that were vacant in the Washington area, 58 and 59, for the experimental broadcast—a routine request that was quickly granted. As the application noted, the Muse signal was 8 megahertz wide, meaning that it would fill all of channel 58 and part of channel 59—exactly the kind of space on the airwaves that Land Mobile wanted to take. The FCC also agreed to let the NAB stage the first demonstration at FCC headquarters, in the commissioners' eighth-floor meeting room.

That done, the NAB formally scheduled the event for just after the New Year—on January 7, 1987. Abel and the others had already prepared the lobbying strategy. Eddie Fritts, the NAB president, opened the campaign in a speech to the Annenberg school of communications on December 15. Suddenly, as everyone could see, Fritts was an HDTV convert.

"HDTV is a vital development on the global television scene," he told the startled group—few of whom had ever heard of high-definition television before. But Fritts went on: "We all know that implementation of broadcast HDTV will require more spectrum. Where will that spectrum come from? We propose that it be drawn from the existing UHF broadcast allocation.

"But ladies and gentlemen," he added ominously, "the Federal Communications Commission appears predisposed to give Land Mobile

users the available UHF-TV frequencies we need to transmit HDTV to all of the American public." If that were to happen, what of America's cherished tradition of free, over-the-air television for everyone? Would the American people be offered high-definition television only if they were willing to pay for it on cable? What would happen to broadcast television then? Would it go the way of AM radio, an irrelevant, forgotten service? Then came the broadcasters' new rallying cry, a mantra repeated over and over again in the following months: If America's broadcasters "are precluded from offering HDTV as a free, over-the-air service to the nation," that will bring *the death of local broadcasting as we know it!*

After the demonstration at the FCC, the NAB and the Japanese moved their road show over to the Capitol and set up in the Senate Caucus Room, the decorous high-ceilinged chamber where the Army-McCarthy hearings were staged in 1954. Many senators and congressmen were curious about this new form of television, though few of them cared about the Land Mobile debate—if they knew about it at all. To most of Washington this particular issue was a parochial squabble that had merited barely a mention in the *Washington Post*. Still, broadcasters had often found that one good way to sway the FCC was to get congressmen on their side. Usually that wasn't especially difficult. When these people went home to visit their districts, they just *loved* to be on TV.

Through the day, senators, representatives, and their staffs filtered into the Caucus Room and took seats for the show, repeated every hour or so. The choreography for this demonstration was the same as the last. The NAB officers gave their pitch about the death of local broadcasting, then came the action scenes from the 1984 Olympic games and the rest. The program was the same, but the audience response could not have been more different—and in a way that neither Abel nor anybody else at the NAB had anticipated. When the congressmen looked at the sparkling high-definition pictures, their eyes widened. Their political pulses quickened—but not because any of them saw a mortal threat to the broadcasting industry. No, for the senators, representatives, and their aides, this show demonstrated only one salient fact.

This stunning new television was *Japanese!*

By that time in 1987, the Japanese were already manufacturing one-third of the television sets sold in America, and enthusiasm for videocassette recorders was reaching its apex. Almost everyone had a VCR, and video rental stores were opening in even the most isolated, rural areas. As politicians could not fail to note, nearly all these VCRs were made in Japan. An American company, Ampex, had invented the video recorder, but Ampex had been interested only in the selling the larger, professional models. The company hadn't tried to design a smaller version for consumers, and when Ampex approached other American manufacturers,

they hadn't shown any interest, either. Finally, Japanese companies had asked to license manufacturing rights, and Ampex agreed; by 1987 Japan and Korea had sold more than 100 million VCRs around the world. That story was a dark legend in the consumer electronics industry.

When Representative Mel Levine of California got up from his seat in the Senate Caucus Room, dumbstruck by the power of this new television, just one sharp question filled his head: "Are we going to let the next major development in consumer electronics go the way of the VCR?" Other congressmen started to grumble, too. Soon news stories began to appear carrying a thinly veiled Yellow Peril tone, and some of the Japanese made things worse. Hikehiko Yoshita, a Toshiba vice president who had helped to arrange the NAB demonstrations, bubbled in one interview that he was "truly convinced of the successful penetration of HDTV receivers into almost every home in the world in the not too distant future." And within a short time, a ringing cry was heard across town: "The Japs are coming, the Japs are coming!"

With that, Chairman Fowler suddenly realized he had "this political problem." A month after the Capitol Hill demonstration, Fowler was testifying before a House subcommittee, and the congressmen peppered him with questions about HDTV. Fowler told them, "I think the broadcasters are overreacting, frankly." Still, before he got up from the witness table Fowler was forced to offer the vague promise that the broadcasters would not be precluded from offering HDTV. What choice did he have? These were the people who set the FCC's budget. A few days later, two letters landed on his desk signed by two dozen senators and congressmen. "We are concerned that the commission is acting prematurely," the representatives warned. The Land Mobile rule "could seriously hamper" American development of HDTV, wrote the senators.

Over at the NAB, John Abel began to realize that his strategy was producing results he hadn't expected. Until this moment, Abel hadn't "fully grasped the true, big political picture." Now he was excited. Maybe he hadn't failed after all. Maybe, just maybe, by playing this Japanese card the broadcasters could turn things around.

The TV industry immediately petitioned the FCC to open an official inquiry to see what effect high-definition television might have on the broadcasting business. And by the way, it said, the Land Mobile decision will have to be postponed until this study is finished. Fifty-eight broadcasting organizations signed the document—the first time these normally competitive, fractious companies had spoken in one voice. "We're fight-

ing for the future of HDTV!" a broadcast industry lobbyist exclaimed to a *Broadcasting* magazine reporter. A few months earlier, this lobbyist probably couldn't have said what those initials stood for.

In early March 1987, the FCC was scheduled to vote on the Land Mobile rule. Even in February the Land Mobile decision had seemed, as Ann Hagemann, another broadcasting lobbyist, put it, "as much a done deal as anything I'd ever seen at the FCC—signed, sealed, and delivered." Then on Wednesday, March 11, the commission released its agenda. Across town, lawyers and lobbyists grabbed the paper as soon as it landed on their desks. Maybe the commissioners would schedule a discussion of HDTV, giving the broadcasters one last shot. But some could not believe what they saw. A few looked the agenda over twice just to be sure, but it was true: the Land Mobile decision had been pulled from the schedule. The commissioners were postponing the vote. Right now the issue was just too hot. Abel was almost giddy. What a lobbying coup! "We've moved mountains," he said.

But Land Mobile wasn't dead. Far from it.

A few weeks later, Chairman Fowler resigned to go into business, as FCC chairmen often do. Commissioner Dennis Patrick was chosen to replace him, and he seemed the broadcasters' worst nightmare. Patrick's father had been a Los Angeles police officer for thirty years, and the common wisdom, as McKinney put it, was that before Patrick came to Washington his father had told him, "I want you to get more channels for Land Mobile." In fact, Patrick got no such instruction, even though his father wasn't the only policeman in the family. His brother and uncle were law enforcement officers, too, and Patrick knew that all three of them had at times relied on mobile radios for their lives. As a result, "my exposure to law enforcement did sensitize me to the importance of mobile communications," he said.

At thirty-six, Patrick was the second youngest person ever to serve as FCC chairman. (William Henry, appointed by President John F. Kennedy, was eleven weeks younger.) But he carried himself as if he were far older. That wasn't surprising; Patrick had been in difficult political fights since his earliest days. In the early '70s, at the height of the Vietnam War, he was chairman of the Young Republicans at Occidental College—a rather small group. ("I was not alone," he quipped later. "There were three or four of us.") After law school, he clerked for a

judge who was a friend of Ronald Reagan, and through that connection he landed a junior position in the White House personnel office. His job was to review candidates for positions in "the cat-and-dog agencies," as the FCC and similar low-profile commissions and bureaus were known. When a position came open on the FCC in 1983, at Mark Fowler's urging Patrick accepted his own nomination.

Now, as chairman, his swept-back hair was prematurely silver, with just a shiny hint of mousse. His shirts were always stiff white, his necktie knots as tight as they could be. He asked the FCC's press officers not to tell reporters that he had been a surfer as a young man. And when he spoke, the words came out in a slow, carefully measured cadence. He liked to offer self-important sounding political aphorisms. "I am interested in notions of optimality," he would say. "The perfect can be the enemy of the good."

Early in the spring, Jonathan Blake, a Washington lawyer representing the broadcasters, decided it was time to have a talk with the new chairman. The broadcasters knew Patrick's reputation; he had been a commissioner since 1983. But he was the chairman now. They had to deal with him.

Blake showed up with a couple of his broadcaster clients, and they arranged themselves around the conference table in the chairman's office. After they exchanged pleasantries, Patrick and the broadcasters traded well-worn arguments: HDTV is the wave of the future, a broadcaster said. If Land Mobile needs spectrum more than you, Patrick countered, then they should get it. Blake listened and considered the situation. They were just hurling statements at each other—the least effective kind of lobbying. Then everyone turned to him. It was Blake's turn, and as he looked back on it later, he said, "I guess I was, as the athletes say, 'in my zone.'"

Blake reminded Patrick of the importance to America of free, over-the-air broadcasting for everyone, rich and poor. For the price of a TV set, every citizen could get local and national news, weather bulletins, and a wide array of programming at no additional cost. But HDTV was coming, no question about it. And all the other services—cable, satellite, and the rest—would be able to transmit it without asking permission from anybody. Only the broadcasters were constrained by FCC regulation. Without help from the commission, only the broadcasters would be left behind. Could the industry survive if it was prevented from

providing HDTV? Could America's tradition of free, local broadcasting survive?

Patrick was listening, so Blake closed with a punch: "You simply can't take the risk that we are right, and find years from now that the bulk of the United States will be precluded from getting HDTV over the air."

Patrick sighed. To Blake he seemed "kind of resigned." Blake remembers that after a moment the chairman told him, "I guess I have to do it."

Blake heaved a relieved sigh of his own. Now it was finally clear: Abel's strategy had worked. The Land Mobile decision would be overturned. The broadcasters had won.

In April, the FCC formally announced that it was reversing itself: no UHF channels would go to Land Mobile until the commission could determine what should be done about HDTV. Then in August the commission opened a special three-month HDTV inquiry. Only after that would the commission decide.

"That was the dynamite charge," he said later. The HDTV problem had his full attention now. So he began asking the American witnesses, "What would you recommend that the Congress or the FCC do?"

After moments like that one, FCC Chairman Patrick knew he couldn't just let this problem slide. He'd have to do something significant when the FCC's three-month inquiry ended, or the arguments would land right back in his office, even louder. This was no longer just another of those parochial, inter-industry disputes. No, the FCC had to "get this off our plate," as Commissioner Mimi Dawson told Patrick. The other commissioners agreed.

"We need to ship it out of here," said Commissioner Patricia Diaz-Dennis.

So Patrick did the natural thing. He appointed an advisory committee to study the matter for a while, the government's time-honored solution to thorny dilemmas. Not only that, he stacked the committee with broadcast industry officials. That would keep them quiet. They'd consider the issue for a while—a year, maybe two. By the time they came back with their report, Dawson believed, maybe interest will have flagged, technological difficulties will have come along. Maybe the problem will have solved itself, and the HDTV crisis will have simply faded away.

John Abel loved the idea. "Advisory committees typically are zoos," he said. "They can be a mess. There are so many ways to slow things down." With a little behind-the-scenes manipulation, the Land Mobile decision could be delayed for *years*!

Patrick named his new group the Advisory Committee on Advanced Television Service and, like the name, the charter was vague enough to cover almost anything: "The Committee will advise the Federal Communications Commission on the facts and circumstances regarding advanced television systems for Commission consideration of the technical and public policy issues." The debate over those extra channels would be delayed until this new advisory committee finished its work.

Appointment of an advisory committee was hardly a momentous event in Washington. Dozens were formed every year. The leaders of almost every agency in government established them anytime they had a thorny

problem they could not solve—and also could not ignore. Still, all of a sudden an official government body was in charge of HDTV. High-definition television was no longer just a lobbyist's mantra. With appointment of an advisory committee, the issue had taken clear form. It had assumed life.

Patrick had to choose a chairman for his new body, and he knew full well that no lightweight would do. The issue was too hot; Congress was watching too closely. Still, it also had to be somebody loyal. He didn't want someone with an agenda who would run the committee off in wild directions—riling Congress, obligating Patrick to do things he didn't want to do.

Patrick talked it over with Mimi Dawson, who suggested Richard Wiley. He was the FCC chairman during the Ford administration and was seen as a friend of the broadcasters. As chairman he had seemed to take their side in some of the early skirmishes with the Cable Mongols. As Abel put it, Wiley was "clearly one of us."

Now Wiley headed a large and powerful law firm that specialized in telecommunications issues. Lawyers in his office represented a host of broadcasters. Wiley, in fact, was general counsel for CBS, and he'd become Washington's most influential lawyer-lobbyist in the field. At the same time, the former chairman still loved the FCC and missed his days in government service. Almost every day, he walked over to the commission and stopped into offices to chat with the commissioners or the staff. Inside that building, he didn't just know everyone's name, he really *knew* almost everybody there, from the chairman to the janitors. So Patrick was confident Wiley would be loyal. Wiley wanted to be liked, *needed* to be liked, by everyone in the building. His business and his personal happiness both depended on it.

Patrick took Dawson's suggestion and appointed him. Wiley was one man who wasn't going to freelance. And it was true; Wiley was loyal. But as Patrick quickly learned, Dick Wiley was no patsy. Under him, Patrick's little Advisory Committee was not going to backpedal and stall until the issue withered and died.

Dick Wiley had worked out his Advisory Committee's bureaucratic problems and plunged forward, as was his wont. He set deadlines, then coaxed, prodded, complained, and threatened when they weren't met. He consulted and massaged the committee members, and before long these men (as usual for this industry, there were no women among the voting members) became his rubber stamp. Despite its cynical origins, Wiley was determined that his committee would accomplish something. He was going to make a difference.

Wiley was a Midwesterner, in his fifties, with perfectly parted graying hair and carefully enunciated speech, delivered with precise, emphatic punctuation. And he was a driven man; he rose before dawn weekday mornings and got to the office by seven o'clock. A brass plaque on his desk read "Thank God it's Monday," and that was no joke. After a decade out of government, he had hoped to get a job in the Reagan or Bush administrations, and his name had been mentioned for several high-level posts. Nothing had come of that. So when Dennis Patrick called him, Wiley had been hungry for "an opportunity to provide public service again," he says. The Advisory Committee was giving him that chance.

"He thought this was very important," said Lex Felker, who left the FCC to join Wiley's law firm. "Part of him is really a corny, old-fashioned kind of guy." Wiley and his wife were regular churchgoers, and he had always been quick to volunteer for nonpaying public service

positions in his profession and in the Republican Party. He had a strong sense of duty. As if that weren't enough, he was Washington's leading attorney in the field of communications law. Heading an FCC committee working on the next generation of television certainly wouldn't be bad for business (though, as he frequently pointed out, he had to give up many billable hours for the unpaid committee work).

Through the congressional frenzy, Wiley "watched the histrionics and kept my head down," he said. He was canny about the low ways of politics; he knew perfectly well when it was best to keep quiet. Instead of adding to the din, he began collecting HDTV proposals from two dozen engineering labs. The FCC was barely paying attention, so Dick Wiley had to decide which direction American television ought to take. Though he was not allowed to say anything in public, Wiley was not about to turn his panel into a coronation committee for the Japanese. If in the end they had the best system, so be it. But others had to be given a chance, too.

America had not changed the broad technical standards for television since the National Television Standards Committee had set out the first ones almost fifty years before. That had certainly been a messy endeavor, and the FCC had performed no better when it set the rules for color TV a few years later. Wiley knew his work would be the stuff of legend in the broadcasting industry for decades to come, and unlike his predecessors he was going to *get it right*. But when he looked at the task ahead, at first he didn't know what to do. He had "all these people with different ideas." How to choose?

In Japan, government and industry had come together and proclaimed Muse to be the standard. And the governments of the European Community were pouring several hundred million dollars into the EC's own HDTV research program. Clearly, the Bush administration wasn't going to support anything like that. What was he to do?

The solution didn't come to him as an instant, blinding insight. It grew incrementally as he made one decision after another. We have all these applicants, he thought, and we have to choose among them. The only way is to test them, see which ideas work and which do not. But this has to be an open process. Otherwise whatever we decide will be subject to legal challenge. So we have to give everyone with worthy ideas the chance to come forward and be tested, too. Still, this can't stretch on forever; we've got to set some deadlines.

In 1988 and 1989, Wiley announced these precepts one by one. Then one day he looked up and realized that he'd started a race!

Nothing like this had ever happened before. Wiley's rules had set off a grand, international competition, sanctioned by the United States government! Anyone in the world could enter. The contestants would be tested and graded. Finally Wiley and his committee would choose a winner, who would hold licensing rights for the next generation of television. Everyone who built and sold HDTVs in America would pay this winner royalties, which would be worth millions—billions! Sniffing the scent of all that money, just about everyone in the world with an interest in television—major corporate conglomerates, people with a few tools in a backyard shed—started writing and calling for entry forms. Wiley's race was launched, and contestants were off and running.

Here at last, in February 1993—more than six years after the NHK demonstration at the Capitol that spawned the race—Dick Wiley's Advisory Committee was set to make some decisions. The Special Panel gathered at a Sheraton hotel in Tyson's Corner, a suburban shopping strip outside Washington. The hotel was pleasant, though certainly not luxurious, but nobody seemed to notice the accommodations. The stakes were too high. The final week of lobbying had been intense—demonstrations, interviews, press releases, private pleadings. Now, drinking coffee at the Sheraton at 9:00 A.M. on Monday, the contestants felt like candidates on election morning. They had done all they could do. Now they awaited the returns. The meeting room was an amphitheater seating fifty or sixty people in semicircular rows of desks and chairs, each desk with its own microphone. The rows narrowed as they descended to a stage at the base. There, behind a table, Robert Hopkins, the Special Panel chairman, would preside.

Hopkins was executive director of the Advanced Television Systems Committee, a broadcast industry group whose principal mission was to publish official documents setting out new technical standards for the world of television. An engineer, he'd worked for RCA for many years, including a long period at Sarnoff. On the Special Panel meeting's first morning, he stood just inside one entrance to the amphitheater reminiscing with Jim Carnes about the old days at the Shrine. Today the two of them were about to take part in the first cut at approving a new digital television standard for America. As both of them considered that, they recollected the days not so long ago when they walked the halls at the Shrine with slide rules hanging from holsters on their belts. Their conversation now was easy and comfortable. Still, the tension in the air was palpable—for Carnes, of course, but also for Hopkins. He saw this

meeting as an important responsibility, and Wiley reinforced that in his brief remarks when the four-day event opened at 9:30.

"Like most of you, I used to have a day job before HDTV came along," he joked. "This has been a long process, and all of you have worked hard. But in my view this is truly a historic meeting, reminiscent of the [National Television Standards Committee] meeting fifty years ago."

Hopkins agreed. He was an unsentimental, businesslike man—some might say pedantic at times, though always pleasant and helpful. At the same time, however, he brooked no nonsense, and he held clear notions about how his Special Panel meeting was to be conducted. He wasn't going to let the contestants push him around. No sirree! Years before, Wiley's subcommittees and working groups had begun work with no clear rules of order. The contestants had attended most of the meetings, and it had never been decided exactly what role they should play. Soon they began taking over many of the sessions, dominating the discussions with ardent advocacy of their own interests. Hopkins wanted to end that right here and now. A week before the Special Panel convened, he vowed, forming his hand into a tight fist, "*I absolutely will not allow a proponent to take over the meeting. I will not allow it! The chairman has a button to cut off all the other microphones in the room, and I will use it!*"

As the meeting opened, the contestants were unaware of Hopkins's oath and probably wouldn't have cared much if they had known. All thoughts were mired in the politics of the moment: who was up, who was down. The only point on which everyone seemed to agree was that NHK, the sole analog system left in the race, was likely to be eliminated.

On the first morning, Keiichi Kubota of NHK sat among the other contestants at the center of the amphitheater, near the top. When the time came, late in the morning, for each contestant to give an opening statement, Kubota was up first and gave his best shot. "We believe being analog is an advantage," he said in a calm, even tone. "It's a proven technology. It can be sent using the same transmitters and the same antennas as [conventional television]. We spent an enormous amount of time developing the Muse algorithm, and we have never experienced a failure."

All that was well and good, but Kubota also knew that if Narrow Muse hadn't actually failed at the Advanced Television Test Center, it had come awfully close. The test results were laid out in a fat binder

that lay on every desk. So he tackled the problem head-on and seized on the easy excuse. "We consider the test results to be a good representation of our hardware—as delivered," he said. "But we had a couple of *implementation problems* with the hardware as delivered to the test center that affected our results. All those improvements are in the hardware. It is already fixed." There are several good reason to pick NHK, Kubota added in closing. "And one of them is that this will improve relations between American and Japanese broadcasters." This may have been the greatest leap of all, if NHK's dealing with John Abel and the others at the NAB was an example.

Bob Rast of General Instrument was next, and he spoke with confident, California salesmanship: "We've got a can-do team. We pushed the envelope. We made digital a reality. The issue now is, the U.S. is once again the leader in television technology." As for the test results, "we believe that in every case where we were not the best, we have worked hard to improve it. We have modified our system to include packetization. Now, is there a runaway leader here? No. But is there a clear leader? Yes, and we say it is DigiCipher."

Wayne Luplow wasn't interested in offering lofty thoughts like that. What Zenith liked most to do was count pennies, as Arun Netravali had once observed. And when Luplow stood up, he told everyone that Zenith-AT&T was the only contestant "that has a practical tuning system," adding, "The others used tuners that will cost \$3,000." Then he complained about testing inequities. "We thought late arrival at the test center would result in disqualification, so we showed up on time. That was one of our problems." (Glenn Reitmeier of Sarnoff, sitting next to Luplow, offered no reaction.) "In summation," Luplow said, "the improvements we have made in picture quality are demonstrable and, I would say, *great*. We are ready to manufacture the equipment if we win."

As Reitmeier spoke for Sarnoff moments later, he rolled his hand over the trackball on his Macintosh Powerbook computer, scrolling his script up the screen. He seemed to be trying to suppress his usual boastful tone, but without complete success—he sounded as if he were reading a press release. "Our system wins or ties for each of ten selection criteria," he said. "No other system can match that." As for Luplow's remarks, Reitmeier shot back, "We are here to pick the best system, not the best tuner." (The Sarnoff consortium's tuner had not performed particularly well.) "We have committed the resources to create an HDTV industry in America." Then Reitmeier closed with the RCA

spin: "We have a record of creating industry-wide revolutions, including NTSC television, color television" and the rest.

Jae Lim was last and offered up his new, unofficial test results. "We have no competition," he asserted. "And the purpose here is to establish the best system for our nation. Our actual performance at the test center was much below our hopes," Lim admitted. But naturally, he added, "we had *implementation errors*." Still, Lim went on, "we were the only ones to finish testing ahead of schedule. We were the only ones to submit a six-channel sound system." He droned on for several minutes, but by now not everyone was listening. A representative from the State Department was dozing, and a liaison officer from the Mexican Embassy was nodding off, jerking his head back up every couple of minutes.

Technical discussions followed, and soon Robert Hopkins got his first opportunity to follow through on his warning, when Wayne Luplow, looking at the test-data book in front of him, asked in a whiny, combative tone, "Why aren't the improvements we offered in this book?" Hopkins slapped him down, swift and hard. "There's no way for us to have any definitive understanding among us of what the improvements are," he said, and quickly moved on to something else. Luplow's mouth dropped open in astonishment; Hopkins was suggesting that all the lab work and lobbying of the last few months would count for nothing.

A few minutes later, Luplow began quibbling about some of the data in the book, and Hopkins, teeth clenched, cut him off in midsentence. "This meeting will *not* be taken over by proponents!" he shouted. "I suggest you discuss that over lunch." Luplow looked as if he might choke.

Though the contestants grew angrier and angrier as Hopkins and the others at the head table cut them off over and over again, the discussion and debate seemed hollow; nearly everyone there suspected that the main decisions had already been made. Seldom if ever in his public life had Dick Wiley scheduled a meeting without arranging all the important decisions in advance, and the Special Panel was no different. As Wiley saw it, his job was to select the best HDTV system for America. All the contestants had come to the test center with one problem or another, but every one of them had made improvements in the months since. Al Sikes had left the FCC; he resigned the day Bill Clinton took office a few weeks earlier. Wiley was more or less on his own now; he could do what he wanted. So Wiley had decided to retest all the contestants. All but one of them, that is.

A few days before the Special Panel meeting, Paul Misener, Dick Wiley's assistant, called Keiichi Kubota at NHK's office in New York. Misener felt as if a decade of history had settled on his shoulders. "After all," he explained a few days later, "I came from the agency that set off all the alarms about HDTV" back in 1986. Before taking a job in Wiley's law firm, Misener had worked at the Commerce Department in the very office where Al Sikes had pushed the FCC to pay attention to high-definition television. NHK was still the problem back then; the world seemed close to accepting the Japanese technical parameters as a global television standard. And Misener had helped persuade Sikes and his successor at Commerce to change the official American position of support for NHK. Seven years later, the wheel had made another turn. Misener's tone was polite but firm when he told Kubota, "We've looked over the test data, and we believe the Special Panel will find that Narrow Muse is not comparable with the others. Mr. Wiley does not believe it will be recommended for retesting."

"I understand," Kubota said. To Misener it sounded as if Kubota was not surprised. He wasn't. "As soon as I actually saw the General Instrument system," he explained a few days later, "at that time I knew I was going to lose." When the Special Panel meeting opened, he offered the best case he could for his system—just to save face, it seemed. But then, toward the end of the fourth day of the meeting, Kubota asked to be recognized. "We are withdrawing from the competition," he announced to a quiet, respectful crowd. "I have already reported this result to our management in Tokyo, and they are comfortable with the decision. On behalf of NHK, I want to thank Chairman Wiley for your guidance. And I thank my colleagues on the Special Panel. We believe that NHK was treated fairly in this process. But I think a digital system is the best for the United States."

"We owe NHK a great debt of gratitude," Wiley intoned. With that, all of the Americans rose from their chairs and offered more than a minute of warm applause to the vanquished. Yellow Peril jingoism had begun the process that brought them here. Now the Americans were munificent in victory, full of warmth and praise as they tried to disguise the satisfaction swelling in their bellies.

Wiley generally accepted almost any invitation that came his way to speak at industry meetings or conventions. Exposure is good for business, he believed. But he and his staff began closely examining conference agendas to see if Apple or MIT figures were invited. One advanced-television conference in Montreal that spring included "a Nicholas Negroponte disciple" on the speakers' list, a staff memo noted. And Wiley had absolutely no use for the Grand Vizier. Another speaker, from Apple Computer, was unfamiliar to Wiley's staff, "but we can guess at his viewpoints." Wiley didn't go. Liebhold and the MIT guerrillas were enemies now—unrelenting and wholly unreasonable, as Wiley saw it. Bring them in, and they'll do nothing but cause trouble. But he failed to anticipate how much fomentation they might brew from the outside.

In early April, Wiley began trying to encourage the Grand Alliance negotiations. He had set May 24 as the first day of retesting, though privately he acknowledged that it was "an artificial deadline." He had watched the jobs dispute with disgust, and then he began noticing that the contestants were hiring Washington lobbyists. Oh god, he thought. We're moving from a technical discussion to a classic Washington political fight. If they're all hiring lobbyists, we're going to be in a hell of a mess.

May 24 was approaching fast, and Donald Rumsfeld had said from the beginning that he wasn't interested in continuing the alliance negotiations once the retests began. On April 20, Peter Fannon sent each contestant a long memo by Federal Express setting out the financial commitments for retesting. That turned the screws even tighter. The new tests were going to cost each of the contestants \$612,000, and half of that was due on May 3. The contestants groaned, but Wiley grinned. This was just the right incentive, he thought. If you don't want to pay, then form a Grand Alliance.

By the first of May, however, Bob Rast was "pretty sure it isn't going to happen." The contestants had met several times—at the National Association of Broadcasters convention in Las Vegas, in Washington, in a conference room at the Airport Hilton in Chicago, in Wiley's office—but the differences and disputes seemed to be growing ever more intractable. Rumsfeld and Pearlman weren't getting along; Pearlman thought GI's president had deliberately snubbed him. The others

thought the Sarnoff consortium was maneuvering to win advantage for its European parents. And Jae Lim—well, “He’s impossible,” Wiley complained in the middle of it all. “A complete pain in the butt,” snarled Peter Bingham of Philips. Lim still wanted his one-quarter share. That was bad enough. Worse, he was insisting that a Grand Alliance system use only progressive-scan displays, the type the computer industry favored. Liebhold and the MIT guerrillas were arguing for that, too. The television manufacturers vociferously disagreed, and each side was arguing its position with the intractable ardor of holy warriors.

To outsiders, the vigor of this debate on an arcane technical point remained perplexing, even absurd. Computer industry engineers saw interlacing as nothing more than a primitive abomination, one more sign that broadcast engineering was trapped in the Dark Ages. But for a host of reasons, broadcasters could not even conceive of abandoning interlace, the picture format they’d been using since the 1940s. They constantly touted the technical advantages, principally that interlacing enabled them to send twice as much signal information over the air.

But behind this lay several important competitive and financial motivations that broadcast-industry leaders seldom mentioned. Most television manufacturers also made TV cameras and related production equipment—a huge, profit-making part of their industry. Some of these companies also held income-producing patents on various interlace-related technologies that were key parts of their products. That income stream would dry right up if the television industry started broadcasting only progressive-scan pictures. Suddenly, the executives feared, they’d have to start *paying* patent royalties to the computer firms that had made progressive-scan monitors and related equipment. Besides, they said over and over again, nobody has even begun designing a practical progressive-scan television camera. It’ll be *years* before anyone is ready to build marketable, affordable TV cameras for studio and field work.

Underlying all that, the broadcasters just didn’t want the big computer companies mucking around in their business. Industry leaders knew that if they continued broadcasting interlaced pictures, they’d effectively block Microsoft, Apple, and Intel from taking any major role in the television world. None of them ever talked about that, however. Publicly they continually pointed out that interlaced pictures were *better!*

Everyone agreed that, in a general sense, a progressive-scan picture was purer, cleaner. But progressive-scan transmissions were twice as large as interlaced transmissions. As a result, the two progressive-scan systems in the HDTV race—Jae Lim's and the Zenith-AT&T entry—actually offered lower resolution than the others. HDTV had always been defined as a picture providing twice the clarity of conventional television, and back in the 1970s NHK had found that the best way to double the clarity was to double the number of lines on the TV screen, to 1,125. The two interlaced systems remaining in the race, by Woo Paik and the Sarnoff consortium, broadcast 1,050-line pictures, while the progressive-scan systems were able to offer only 787.5 lines. Zenith argued that the *perceived* resolution was actually just as good, if not better, because viewers were not bothered by the flaws inherent with interlacing. And the Zenith-AT&T system did look awfully good. Besides, Zenith and the other progressive-scan advocates argued, they were limited to 787.5 lines only for the moment. As compression technologies improved they would be able to increase that to 1,000 lines or more.

For now, though, the test results had showed that the two interlaced systems offered a better picture, giving real power to those advocates. This debate had grown only hotter over the previous months. And on May 11, Lim wrote a letter to the other contestants stating his position on the outstanding issues, including the debate over transmission formats. "The main issue here is whether or not we include interlaced scanning format as one of the possible transmission formats," he wrote. We should not, Lim added. "I fully recognize that some broadcasters will be unhappy about this choice. By jumping into the cold water and beginning to swim, we will achieve the ultimate goal of progressive scanning much earlier." Over the following days, Lim would brook no counter-arguments, and his insistence pulled the negotiations down into still another pit of muck. How on earth could all these people with such disparate interests ever move forward?

Early in the week of May 17, General Instrument moved Lim's system into equipment bay No. 1 at the Advanced Television Test Center. The competitors were no closer to forming a partnership than they'd been a month before, and most of them were ready to bow to the seeming inevitability of their failure. All of them had mailed their advance payments to Fannon—\$306,000 each. But even as GI and MIT

engineers were hooking Lim's cables to the test center arterial lines, all of the companies' principals decided they had better make one last effort.

They convened at the Grand Hotel, the first-class establishment on M Street near Georgetown where GI had staged its most recent demonstration just three months earlier. On Wednesday morning, May 19, 1993, about two dozen people from AT&T, GI, MIT, Philips, Thomson, Sarnoff, and Zenith checked into their rooms and then divided into three groups—engineers, lawyers, and corporate executives. Each group gathered in one of three conference rooms and settled around large walnut tables to make one last try. If they couldn't settle by Friday, they would run out of time. The retests would have begun.

The issues were straightforward. Jae Lim still wanted his own share of the profits, though he had gradually reduced his demands. Whatever he got would go to MIT, not to him. But the university had a profit-sharing arrangement with its faculty, so even a tiny share promised to make Lim quite rich. In his May 11 letter, he had offered to take 16 percent, leaving the three other groups with 28 percent each. By May 17, the active proposal under discussion would give Lim a 3.33 percent share. As everyone gathered around the Grand Hotel conference tables, they had agreed on that. So Lim turned his considerable disruptive energies to other matters. He was still stuck on progressive scan. On this he would not budge, and AT&T's engineers agreed.

Though that was the largest remaining disagreement—"the gigantic issue," Joe Donahue called it—it was hardly the only one. The Sarnoff group had backed down from its insistence that it would not support the Grand Alliance system outside the Western Hemisphere, but several potential partners still had problems with the patent-sharing plan. The active proposal was that everybody's patent-royalty payments would be pooled and then split; these were the profits that Jae Lim was worrying about. But the Europeans—Philips and Thomson—didn't think members of the Grand Alliance should have to pay royalties to each other, even if those payments went into a pool. They figured they would sell more HDTVs than anyone else and end up putting more money into the pool than they would get back. They also wanted to know whether European patents were to be included. Beyond that, each of the contestants wanted one or another of his own technical innovations, real or imagined, included in the final system. Everybody also had various additional pet requests.

These were the issues they had been debating for weeks, most recently during a marathon session at the O'Hare Airport Hilton the week before. There they had seemed to make some progress, particularly on the vexing question of progressive scan versus interlace. In Chicago they'd begun discussing a compromise—a system that could handle *two* display formats and switch from one to the other automatically, depending on what signal information came in. The set would display progressive *or* interlaced pictures, whichever was being broadcast. If we build the transmitters and the TV receivers so they can switch automatically, they said, we can make *everybody* happy.

Arriving at the Grand Hotel, the would-be partners hoped they could agree on that. Nonetheless, this proposed solution quickly fell apart. At the conference table, AT&T, supported by Jae Lim, suddenly delivered an ultimatum: We will not agree to any proposed system design that includes any interlace at all. But Donahue thundered back, "We will not accept zero interlace. We just won't accept it!" The other side countered with well-worn arguments: These TVs have to be compatible with computers. We have a chance here to kill interlacing once and for all. We have to take it.

They quarreled through Wednesday. On Thursday morning, Lim left the Grand and went to the test center to get his system ready for testing. By then a partnership agreement seemed a long shot at best. In fact, by Thursday afternoon, the progressive-scan ultimatum still sat on the table, and the negotiators had fallen back into loud arguments, angry name-calling and finger-pointing. One after another they settled back into their chairs, arms folded, sullen expressions on their faces, as the realization dawned: This is impossible. Finally, Donahue declared a deadlock.

"Thank you very much, but we're leaving," he suddenly announced, leaning forward in his chair and placing his hands flat on the tabletop. "It's all over. We have to leave."

"But first," Donahue added after a dramatic pause, "I want to get Dick Wiley over here. I want you to present your ultimatum to Dick Wiley so he won't hear ten different versions from ten different people later."

Robert Graves of AT&T, who saw himself as the most astute politician of the group, had tried to keep Wiley involved from the earliest days of the Grand Alliance discussions. And Wiley very much wanted to be a part of these final talks. Graves had promised to call if anything

was agreed—or if failure seemed imminent. Wiley was working in his office a few blocks away but taking few appointments—“staying loose,” he said, “expecting to go over to the Grand and shake hands, congratulate and bless them.” By Thursday afternoon, he’d heard nothing, not one word, and he was “on pins and needles all day.” Finally at about four o’clock, Wiley’s secretary told him that Graves was on the line. Wiley was still expecting to be summoned “to bless it.” But when he picked up the phone, Graves’s manner was somber.

“We’re about to break up,” he said. “I suggest you might want to come over.”

Wiley immediately called his assistant, Paul Misener, who was at the test center with Lim trying to work out final arrangements for retesting Lim’s system, which was supposed to begin the following Monday. Wiley told Misener to get right over to the Grand. Then he hung up, grabbed some papers, and headed for the elevator.

When Misener told Lim what was happening, Lim fell into a near panic. “They’re going to make a deal without me!” he stuttered. He dashed out the door and ran down the street waving his arms wildly to hail a cab. Misener followed, bemused.

Wiley, Misener, and Lim all pulled into the Grand’s circular driveway at about the same time, and when they got to the fourth floor the would-be partners were still seated at the conference table, jaws set, faces locked in expressions mirroring the bitter intractability of their debate. At the table were Pearlman; Bingham; Carnes; Richard Friedland, a vice president of GI; Curtis Crawford, a vice president of AT&T’s microelectronics division; and John Preston, a senior officer from MIT. Lim sat down next to Preston. Others sat in chairs along the walls. The men at the table—and as usual there was not one woman in the room—shuffled to make room for Wiley, who pulled up his chair and asked, “OK, where are we?” Right away the others started arguing again—“jabbering,” as Wiley put it. “Screaming and yelling at each other. Pearlman started getting all mad. They sounded like *children*. This was going nowhere.”

Wiley put up his hands. “Wait a minute,” he interrupted. “Why don’t we see if there’s anything we *do* agree on.” With that, everyone shut up, and Wiley jumped in. The few minutes of arguing and finger-pointing had shown him that the biggest hangup was still this damned progressive-interlace business, so he asked, “Can we all agree that our *ultimate* goal is a thousand-line progressive system? We can’t get there

now, but isn't that where we want to be in a few years? You know, the handwriting is on the wall for interlace. Progressive is the future. Can't we agree on that?"

That was a Mom-and-apple-pie offer. Sure, why not? It would be great if we could have progressive scanning *and* true thousand-line HDTV. But we don't know how to do that now. "Can we say we plan to *migrate* to that when we are able?" Wiley asked. OK, everyone said, including Lim and AT&T. We can agree to that. "Well, that's something," Wiley said, leaning back for a moment.

But what about now? the others were asking. We need to decide what the Grand Alliance will build right now. A few minutes earlier, while they were waiting for Wiley to come over, the AT&T team had left the room to discuss the progressive-scan ultimatum. Apparently they hadn't wanted to be painted as the villains behind the collapse of the Grand Alliance, because when they came back a dual scanning format proposal was suddenly on the table. They appeared ready to accept—begrudgingly, in the others' view—the earlier plan to build a machine that could handle both progressive *and* interlaced displays, switching from one to the other automatically.

We're making progress here, Wiley said after about an hour. We have the outlines of an agreement. Let's take a break. You can caucus and talk things over.

Everyone got up and left the suite. Wiley sat there with Misener for a few minutes, then got up to check in with the groups to see if any of them needed encouragement. There were three "caucuses," situated in a way that made the politics of the moment clear. The General Instrument, Zenith, and AT&T officers were together in one suite, and to Wiley everybody in there seemed fine. The members of the Sarnoff consortium were together in another suite; though they were not giving much away, Wiley saw no big problems among those people now either. The third "caucus," Jae Lim, was pacing the hallway. Wiley walked up to him and asked, Are you OK with this, Jae?

Wiley was a tall man, maybe an inch over six feet, and Lim was at least half a foot shorter. So he was looking straight up at the chairman as the sanctimony poured forth. "I can't support anything that isn't 100 percent progressive scan," Lim said, in a tone that suggested, I am the only righteous person here. "I think that is best for America."

Wiley groaned and rolled his eyes. "Give me a break, Jae," he said. Wiley was convinced: This is the moment. Now or never. If we don't

come to agreement right now, it'll never happen. This whole thing will fall apart. America may *never* get HDTV. And now Jae is driving me nuts!

"Jae," he said with obvious exasperation, "we have a *migration* to progressive scan."

Lim just looked up at him. "We're going to lose this whole thing any minute," Wiley argued, and he was wagging his finger in Lim's face now. "Come on, Jae, this will be *good* for MIT. You'll be a part of this whole thing. You can't expect all these people just to *capitulate* to you. You can't! Jae, you've got to compromise."

Lim hadn't been in the room for all the discussion concerning the progressive-scan ultimatum earlier in the day. He hadn't seen how the compromise had come about. But it probably wouldn't have made any difference if he had. He wasn't budging. Bob Graves had anticipated this problem. Even before the meeting, "Lim was adopting his religious attitude, holier than the rest of us," he said. Graves had already decided that Lim needed what Graves liked to call "support" from somebody above him at MIT. That's why Preston was here. Preston took Lim into a room, and they called the leadership of MIT in Cambridge. This agreement potentially represented a lot of money for the university, millions of dollars, and eventually Lim was persuaded to agree to the compromise. That's what he told everybody when they reconvened in the conference room. One more big problem solved. Or so it seemed.

The conferees deferred some decisions, particularly the questions about which parts of which systems they would choose for the new Grand Alliance machine. Zenith and GI both insisted that they had the best transmission systems—a striking claim in GI's case, considering that Jerry Heller and the others at the VideoCipher Division had been certain that Paik would be unable to build any transmission system at all.

Lim insisted that his audio system was the best; he'd been an audio engineer before he took over Bill Schreiber's advanced television program. But the Europeans wanted theirs chosen. Musicam was set to be the audio standard in Europe. The others favored picking Dolby AC-3; it was vying to become an industry standard of sorts in the United States.

We'll hold our own competitions to select the best of these systems, they decided. Put the contenders up, run them through their paces, and

then pick the best one. No politics, no arguments. We'll make these decisions on technical merits alone. Neat and clean. With that, they resolved the last of the major arguments that had vexed them for months. So Wiley suggested they move on to the final step: Let's put out a press release.

Just before rushing over from his office, he'd picked up a draft of a press release that Paul Misener had already written announcing that the Grand Alliance had been formed. "For immediate release: May 20, 1993," it said at the top. (Actually Misener had written it on Wednesday the 19th.) "The FCC's Advisory Committee on Advanced Television will review a single HDTV system proposed today by a 'Grand Alliance' of entities that, until now, had sponsored four competing systems. These entities today reached a business and technical agreement and submitted to the Committee a merged technical proposal." Misener had even filled in canned quotes from Wiley showing how satisfied the chairman was with the agreement:

"I believe the Grand Alliance proposal, subject to Advisory Committee review and approval, will lead to the best conclusion of a process that has fostered the development of highly advanced digital HDTV broadcasting and cable technology. The members of the Alliance should be commended for their accomplishments."

Wiley made copies of this and passed them around the table for comment and editing, then he placed a yellow legal pad in front of him and began drafting an insert to account for the new agreements. While the others looked over the draft, Wiley wrote, "The proponents unanimously endorse the objective of moving the standard to thousand-line plus progressive scan as soon as feasible and will work to accomplish a definitive migration path." When he read that aloud, suggestions flew at him.

"Say 'migrating,' not 'moving to' thousand-line progressive," somebody said, so Wiley wrote in the correction. "Not thousand-line *plus*, just thousand-line." Wiley scratched out the word "plus." "Get rid of this 'definitive migration path' business." And with a little discussion they agreed on a substitute sentence that fuzzed things up a bit: "All parties agree to eliminate the interlaced scanning format from the transmission path in the future."

In just a few more minutes, they worked out most of the other wrinkles. The deal was done, except for one thing: the Sarnoff group couldn't give a definitive yes until Joe Donahue approved, and the

Thomson representative still had problems with the patent-sharing arrangements, though he offered no specifics. They conflicted, he said, with previous agreements between General Electric and Thomson. But Donahue promised to get the questions settled quickly. Great, Wiley said. We'll have our press conference at ten o'clock tomorrow morning.

He wasn't about to tell them, but he saw this press conference as the critical last step to "lock them in," as he put it. Once this got into the newspapers, nobody would be able to change his mind. The deal seemed complete, or nearly so, and everybody left.

Wiley was back at his office, and the call from a member of the Sarnoff group came a short time later: Donahue still couldn't sign. He still hadn't worked out the patent questions.

Wiley sighed and called Donahue. "Joe, come on," he said. "We've got everything settled. You can't hold this up."

It's not going to be a problem, Donahue assured him. But by the end of the day Donahue still wasn't ready to sign—and now the patent issue was riling some of the others. Just what were these patents, some of them wanted to know. As Thursday drew to a close, Wiley worried: this thing could still fail.

Another problem flared at 7:30 Friday morning. Friedland, the GI vice president, called Wiley at home. "Jae wants to put out his own press release," he announced. He wants to say he doesn't agree that an interlaced format ought to be a part of the standard at all.

Wiley sighed aloud. "We can't put out *two* press releases," he said. Friedland agreed. Then Wiley got an idea: "What if we give Jae a *foot-note*. Let him say what he wants there." I'll ask him, Friedland said.

A short time later, Donahue called. I still don't have everything settled, he said. Wiley knew in his bones that nothing would happen today. By now the workday was nearing its end in Paris, where Thomson's leaders lived. And it was Friday, too. The whole thing seemed to be unraveling. Wiley called all the principals and said, Let's reschedule our press conference for Monday morning. Get everything settled by then. He had already called his good friend Jim Quello, the acting FCC chairman, and asked whether they could stage their press conference in the FCC's eighth-floor meeting room. Sure, Quello said, and he'd agreed to attend. But now Wiley wasn't so sure the event would ever get staged at all.

By early Monday morning, Lim had agreed to the footnote idea, and Paul Misener added this new language to the draft. It appeared at the bottom of the second page, in a smaller typeface: "MIT believes that a digital video broadcast standard that exclusively utilizes progressive scanning, from the beginning, is in the best interests of the United States." Silly but harmless, Misener and Wiley agreed. The new draft was faxed to all the players, and at 10:00 A.M. Wiley got all of them on a conference call.

"Thomson is prepared to sign," Joe Donahue declared, to Wiley's great relief. But by now some of the others weren't so sure. Donahue had spent four long days working out his intellectual-property contracts—four days for the others to fester, maybe even imagine that Donahue was screwing them somehow. "A lot of stuff had been happening behind the scenes," Jim Carnes recalls, "a lot of stuff nobody understood." Among the other would-be partners, the tentative agreement had begun to unravel, and on the phone one after another of them spoke up to say, I've got two or three changes I want to make.

Donahue had guessed this would happen. Everybody's trying to get something, he thought. Just as he'd planned, Donahue broke in and said, "Oh, you want to make some changes, do you? Well, if you want to reopen negotiations, I've got ten or twelve changes I'd like to make. We can be here all week." Or, Donahue said again: "Thomson is ready to sign *this* agreement, right now."

Wiley groaned. More nonsense. He didn't understand all of it, wasn't really privy to the details of the *business* negotiations, but by god, he was not going to let this fall apart now. "I've got all day," he said. "I'll stay right here on the phone. Let's get it worked out."

Hour after hour, Wiley sat there at his desk talking into his speakerphone, prodding and encouraging while some of the others dropped on and off the call, working out of earshot. All the while, reporters were calling Wiley's office. Periodically his secretary carried the phone messages into the room. The *New York Times* had run a small story on Saturday noting that the contestants seemed to be close to an agreement, and this morning it seemed as if the entire national press corps was waiting for word. Trying to keep the pressure up, Wiley told the others that the press was growing anxious.

Finally, after lunchtime, they seemed to be ready. At 1:10 P.M., more than three hours after the conference call began, Wiley called for a vote.

"Sarnoff," Wiley said.

"Yes," came back from the speakerphone.

"General Instrument."

Yes.

"MIT."

Yes.

"Philips."

Yes.

"Zenith."

Yes.

"AT&T."

"No," Curtis Crawford answered.

Wiley rolled his eyes. "Come on now, Curtis," he said. "We've got to move. I can't tell you what to do, but get this settled. We've got to move."

Crawford got off the line, and Wiley kept all the others on the phone. He didn't know what was going on in the background, though fifteen minutes later it appeared that some sort of compromise had been reached. So at 1:25 Wiley called for another vote. This time AT&T offered a conditional approval, subject to clarification from Donahue on a business question that wasn't openly stated.

Go do it, Wiley said, and he still kept everybody else on the line. Reporters continued calling, meanwhile. Their deadlines were rushing at them, and this would be a complicated story to write. Finally, at 2:35 P.M. everyone came back on. More than four and one-half hours after the phone call began, Wiley called the third vote.

"Sarnoff."

Yes.

"General Instrument."

Yes.

"MIT."

Yes.

"Philips."

Yes.

"Zenith."

Yes.

"AT&T."

Yes.

Misener and Wiley smiled at each other across the desk. It was done. The new partners sighed, and with nervous laughter some of them asked,

"What have we done? I hope this isn't a big mistake." But Wiley was still pushing. "Come on now, we've got to get over to the commission for the press conference now. It's now re-scheduled for 4:00."

The FCC meeting room was packed. Television network cameras were lined up across the front, and copies of Misener's press release lay stacked on a table to one side. Wiley introduced the new partners, and Chairman Quello blessed the agreement. This partnership will actually *speed* the arrival of HDTV for America, he and others said, because it will reduce the possibility of lawsuits from losers.

The next morning, Ed Andrews's article about the new Grand Alliance was the lead story in the *New York Times*, and most other papers gave the story front-page treatment. For the previous year or so, HDTV had been ignored by the mainstream press. Now here was a bath of warm attention, reminding the nation that America led the world and that high-definition television was almost here.

17 *The most insidious enemy*

The insurgency started so quietly that Dick Wiley barely noticed. Stalking him was a nontraditional predator, and the chairman's problem may have been that he remained focused on the accustomed enemy, John Abel and the National Association of Broadcasters. It's no wonder. While congratulations flooded into Wiley's office from around the world the day after the Grand Alliance announced agreement, the NAB broadcast a snippy little press release, as if to say, Don't forget us. "The Grand Alliance will shorten the time needed to achieve an HDTV standard by avoiding possible costly and lengthy legal challenges," it said. "But the agreement inspired by Dick Wiley is vague in technical details that are vital to broadcasters, and we have several concerns." It went on to complain that some technical parameters had not been set and the means of setting them were "yet to be defined."

As Wiley saw it, the Advisory Committee had a strong hand just then. Other broadcaster groups were full of praise, and in any case, by the summer of 1993, John Abel and the others at the NAB weren't doing or saying much of anything that anyone could see. "They're tranquil right now because their ox isn't being gored," Wiley said. "But if I were to gore it, I think they'd come running out of the woodwork."

A few other complaints filtered in, but none of them seemed particularly serious. So it was little wonder that Wiley wasn't overly concerned about the note from Mike Liebhold, the Apple employee who was the point man for the guerrilla faction up at MIT. It landed on Wiley's desk just two weeks after the convocation at the Grand Hotel. "Please accept my sincere congratulations for leading the negotiations resulting in the Grand Alliance agreement," Liebhold began. "There is much to celebrate. There is, however much remaining work to be

completed. . . . I would like to accept your kind offer to provide an active role for my technical contributions. You may recall that during our last conversation, you assured me that you would enroll my *active* contributions in the final technical advisory process. Accordingly, please include my name among the active, voting members of the Technical Subgroup."

Wiley wasted no time answering that one. The chairman wasn't about to appoint this rabble-rouser to his most important subcommittee. He responded the next morning: "Thank you for your letter of June 8. I appreciate your interest in the work of the Advisory Committee. Prior to receiving your letter, the appointments to the Technical Subgroup were finalized. While you were not among the appointees to this limited body, your continued interest in its proceedings would be most welcome. I encourage you to be active. Please accept my best regards."

For Liebhold, that had been Wiley's last chance. Now *he* was angry.

"The major stakeholders in the National Information Infrastructure are not being included in the Advisory Committee process!" he started shouting all over Washington. "I'm talking about the people from the education, scientific, and computing industries." With help from Cambridge, Liebhold was now on a crusade, and his principal goal was to kill the interlace dragon once and for all. "They are saying that for all these economic reasons they have to include interlace," he argued. "The arguments are nonsense. The entire TV industry has plenty of time to gear up, to manufacture a simple device that can display an electronic textbook. They are going to populate the country with millions of TV sets that are not capable of displaying the simplest benefits of the National Information Infrastructure."

Liebhold laid out his complaint for members of Congress, technology officers in the Clinton White House, anyone who would listen. "The computer industry tried to use interlace scan years ago," he told the House Committee on Science, Space, and Technology in June, "but found that the display flicker produced on text and graphics rendered it unusable. . . . In an apparent attempt to compromise, the Grand Alliance has announced a preliminary intent to support both interlaced and progressive-scan transmission. In its current form, this compromise could result in a de facto interlaced standard." Equipment manufacturers would continue making interlaced sets, because they were cheaper, he argued. Millions of Americans would buy them. "Progressive will never

be given a chance to flower. And the Advisory Committee is so dominated by equipment manufacturers that it can do nothing about this!"

Liebhold pumped out this view week after week, and soon Wiley began seeing the results. Members of Congress were sending him letters: Why aren't you being more accommodating to the needs of the computer industry? In a meeting at the White House, a senior technology officer asked, Why don't you just bite the bullet and make it all progressive? Wiley was getting angrier and angrier. Few things bothered him more than people working against him behind his back. "We *explained* that we have this migration path to progressive," he fumed, "and Liebhold seemed to accept it. I thought we had it worked out. But then he turns around and does all this. He's over at the White House complaining. And with Apple's ties to this administration. . . ." Wiley shook his head. "He's telling everyone this doesn't fit on the information superhighway, and then he's up there on Capitol Hill jangling Markey's chain. In twenty-five years in this business, I've never met a man as difficult to deal with as him. I told *Broadcasting* magazine that he was unsatisfiable. He is totally unreconstructable!"

Liebhold countered, "They're completely faking this migration strategy to progressive. They *have* no migration strategy. There is no migration plan. Important people in Congress know what's going on. Ask Markey!"

Sure enough, in early July a letter from Representative Markey landed on Quello's desk. The chairman of the telecommunications subcommittee—the man who had put on the very first HDTV hearing back in 1987—wanted answers:

Has the Grand Alliance fulfilled its commitment to consult with the computer industry and others involved in HDTV applications to ensure that their views are heard and their concerns are integrated? Please outline how, if at all, the Grand Alliance has fulfilled or is planning to fulfill its commitment to consult these companies or institutions.

Has the Advisory Committee on Advanced Television Service included representatives of these industries in its review process?

Wiley could barely contain himself, but he knew he had to do something. "The one thing I could see happening," he said, "is this White House—which is the computer-nerd White House—getting together and saying, 'Gee, this Advisory Committee recommendation was based too much on the interests of broadcasting.' " He frowned for a moment.

"There's going to have to be something in there for the computer people. Or else I don't think that our recommendation will be believed or accepted. It will be turned around. That's my view."

His relationship with Mike Liebhold was not improving. Far from it. The two of them fell into an angry shouting match on the phone. Wiley blew up at him, and the next morning a letter from Liebhold arrived by fax:

I am appalled that the chairman of such an important process would lack the fundamentals of civil communications! You appear to have no interest in dialog. You neither allowed me to begin or complete a sentence, nor gave me an opportunity to reply to your continuous stream of hostile assertions. If browbeating and intimidation of legitimate dissent is an acceptable behavior for the chairman of an advisory process, then the process is flawed. (And I am not intimidated.)

A short time later, Wiley called his advisers and allies to ask: Should we have a summit meeting with the computer people? Bob Rast told him he didn't think that would accomplish much. Well, Wiley next suggested, what about appointing "an interoperability subgroup." Good idea, everybody said, so Wiley asked Robert Sanderson, the Kodak executive, to head it. He was already working on one of Wiley's subgroups. As he saw it, Sanderson was a "reasonable" computer advocate. Not like Liebhold.

Wiley was much relieved when Sanderson agreed to serve. "I can work with him," he said. Sanderson made a few requests, and Wiley accepted them. Given the prominence of this issue, Sanderson and Wiley agreed that the interoperability panel should be a freestanding subcommittee—its name would be the Joint Experts Group on Interoperability—and Sanderson wanted to appoint the members. OK, OK, Wiley assured him, though he and Joe Flaherty insisted that some of their people be on the panel, too.

Well, when Sanderson's proposed membership list came in, one name jumped right off the page: Michael Liebhold, senior scientist, Apple Computer. Wiley swallowed hard, but there was nothing he could do. He had agreed to let Sanderson pick the members; he couldn't change his mind now. Another Technical Subgroup meeting was coming up in August, and now Liebhold would probably be there. Not sitting at the big table, mind you. Off to the side somewhere, but in attendance nonetheless—with official standing.

In late July, the Advisory Committee settled on a date for the Technical Subgroup meeting and sent out notices by fax. Among the replies, one came from Sanderson on August 4. "I will not be able to attend the August 11 meeting of the ACATS Technical Subgroup," he wrote. He planned to be away. But he had appointed a vice chairman, the man who would be acting chairman of the Joint Experts Group on Interoperability at the next meeting. The man who would sit in his place at the head table, just a few seats down from Wiley. The vice chairman was . . . Michael Liebhold.

Sanderson chuckled when asked later if he'd known what he was doing. He was well aware that Wiley had refused Liebhold's request for a seat on the Technical Subgroup, but he thought "it was important to bring Mike into the process," as a means of "reconciling and converging the views, instead of taking potshots at each other from the outside." But the way Bob Rast saw it, "The fox is in the coop."

The Technical Subgroup met in a conference room at the National Association of Broadcasters, next door to the smaller meeting room where, in 1986, the idea had raced through John Abel's head: HDTV . . . maybe that's it! This morning, however, nobody was thinking much about the broadcasters. All eyes fell on Liebhold, who sat at the table with the other Advisory Committee luminaries, about five seats away from Wiley. He wore jeans and a sport coat. His little rat-tail haircut fell over the open collar of his shirt.

Most of the decisions to be made here were technical, and the meeting slogged through a morning of tedium. Liebhold kept his remarks brief; he seemed to be trying to avoid confrontation. For his part, Wiley was working very, very hard to be a gentleman. Nonetheless, comments, looks, and asides made it clear that most of the people at the table just couldn't stand the man from Apple.

The Report of the Joint Experts Group on Interoperability was scheduled for 11:45, the agenda said. When the time came, another Advisory Committee member read Robert Sanderson's report out loud. It announced that Sanderson intended to hold a three-day meeting and then a second two-day event, both in September, "to evaluate the Grand Alliance proposal from the point of view of interoperability."

Rast exploded when he heard that. "What was just discussed is new to the Grand Alliance," he declared. "We've got to balance things. Let's

18 The dreaded "H" word

From his earliest days in Congress, Al Gore had been an enthusiastic advocate of advanced technology. Now that he was in the White House, the vice president gloried in inviting reporters over to show that he could carry on E-mail conversations at his desk, and as everyone noted, this was in sharp contrast to the technology-averse Bush administration. So it seemed only natural that after a year in office, it was Gore who stepped up to announce the Clinton administration's new technology policy—an ambitious plan to wire the nation so that everyone could enjoy the benefits of the digital age.

In a carefully choreographed speech in Los Angeles, presaged with fulsome advance publicity, Gore reminded the nation that the federal government had built the interstate highway system—the envy of the world. And “today,” he went on to say, “we have a different dream for a different kind of superhighway—an information superhighway that can save lives, create jobs, and give every American, young and old, the chance for the best education available to anyone, anywhere.” Gore challenged telephone and cable TV companies “to connect all of our classrooms, all of our libraries, and all of our hospitals and clinics by the year 2000,” so that every American would have access to “the National Information Infrastructure.” The vice president’s tone was lofty, and his speech was filled with metaphor as he outlined a legislative proposal intended to promote these goals.

Most telecommunications industry leaders welcomed the new initiative—although, as always, they wanted the government to put up more money. Over at the National Association of Broadcasters, however, the leadership had an entirely different reaction. They cried out in unison: What about *us*? Gore had spoken at length about new rights and powers for telephone companies, the computer industry, even cable television

firms. But he had nary a word to say about television stations, and the broadcasters fell victim to the tired analogies that had long plagued these discussions: "The vice president of the United States left them on the shoulder of the information superhighway," an article in the following week's *Broadcasting & Cable* magazine said.

In truth, the NAB did feel wounded. After all, Abel argued, if you want to bring the National Information Infrastructure into every building in America, you don't have to lay wires, pass laws, launch satellites, or purchase computers. "We *are* the National Information Infrastructure," he began saying, one finger raised above his head as he preached the broadcasters' new gospel. "Nobody has the penetration we have. We're it. We're like the air. We're everywhere! No wire is ever going to achieve the universal service we already have."

Abel was right. Almost 99 percent of the homes in America had at least one television set—more homes than had telephones or flush toilets. Most hospitals, clinics, and schools had at least one TV. So, Abel said, "we are going to try to insert ourselves into this debate." He and others quickly began to see that the vice presidential neglect might be turned into a tactical advantage. And at that very moment the high-definition television debate took a decisive turn—one that threatened to push HDTV toward its demise.

For years, everyone had known that digital television would allow broadcasters to provide other digital services along with high-definition pictures. Nonetheless, neither the NAB nor anyone else had carefully considered all the implications of this. It took Al Gore's speech to focus the thinking.

Now Abel and the others began to concentrate on one clear fact that few people had thought much about before: A digital bitstream doesn't have to carry high-definition images. It is infinitely flexible. In fact, a television station could in theory forgo *high-definition* television altogether and use digital compression to broadcast four or five conventional TV signals over the same space on the airwaves. Broadcasters could also sell paging services, video cell-phone networks, pay-per-view movies, on-screen E-mail. They could enhance TV advertising—provide detailed information on request about the price or features of a new house, to complement a real estate advertisement. Or they could simply broadcast several conventional programs—"multichannel broadcasting," this

came to be called. The possibilities suddenly seemed limitless. And as a positive *bonus*, some of them realized, the new political reality might finally have given them the arguments they needed to evade *high-definition* television once and for all.

Instead of squealing about the high cost of installing digital equipment, the broadcasters started saying: We'll spend what it takes to enter the digital age. But give us the flexibility to use this new equipment to earn back our investment. Give us that second channel Al Sikes promised us. Don't tie our hands, and we'll bring the National Information Infrastructure into every home. This new tack carried an implicit message: Don't make us broadcast high-definition TV.

Woo Paik and Jerry Heller had realized from the beginning that the digital technologies they were pioneering could be used for other purposes. In fact, years earlier Paik had created a digital compression system for conventional cable television that would allow cable operators to transmit three or four channels in the space previously occupied by one. But the rest of the industry had been slow to understand the implications of this. Now, however, "there has been a shift, indeed there has," noted Jim McKinney, the former FCC official. "It was brought on by digital broadcasting, which really doesn't have anything to do with HDTV, except that HDTV is what got it invented. All of a sudden, they know now that they can do a lot more with digital than they ever could with analog TV."

Michael Sherlock, the NBC vice president, agreed. He also happened to be the president of the Broadcasters' Caucus, the powerful political organization that represented all the major television networks and their trade groups. A few months earlier, the caucus had written that letter to counter the MIT guerrilla attack. "The NII [National Information Infrastructure], that's the break-off point here, and I think it's great," Sherlock said in February 1994, just a few days after a caucus meeting that had been called to discuss this. "Deep down there isn't any disagreement among us: All of the people around the table want the ability to offer digital services" on that second channel the FCC was supposed to give out.

As for high-definition television, the digital service for which that second channel was intended, "I'm sure everybody would say, 'Fine,' if there is a requirement that the second channel also be used at some time for HDTV—some minimum, to the extent that the market demands it. In the first years, maybe an hour a night of HDTV. Or an hour a week."

Then Sherlock confided, "We can't say that. If we came out and said we want to do only other services, then it would be turned around to say we don't want to do HDTV. That's the fear. We'll be misunderstood. Broadcasters will be painted as if they don't want any HDTV."

Which, of course, was exactly the truth.

Sherlock knew that open discussion of the second-channel issue would lead to news stories and widespread accusations that the broadcasting industry was engaged in a flagrant "spectrum grab." That second channel had been offered for one purpose only: to ease the transition to *high-definition* television. If the broadcasters came out foursquare with the truth—We don't want HDTV at all—they feared they might not get their extra channels at all. John Lane, a Washington attorney representing Land Mobile, was complaining that the HDTV race had now delayed Land Mobile's efforts to get those extra channels for *seven years*. Meanwhile, police and fire departments "definitely, desperately need" those vacant channels that had been set aside for HDTV.

So the broadcasters' strategy was set: Ride the Clinton administration's National Information Infrastructure initiative. Get the second channel, and use it for moneymaking advanced digital services. Describe them as central to the White House's new pet initiative, the NII. As for high-definition television—be vague.

Even with all of this, the next morning it became clear that Hundt had modified his view a bit. Over a breakfast with the broadcasters, he tackled the high-definition television issue head-on. "There has to be the possibility of delivering full HDTV over the air," he said. But then he added: "I am wary about the wisdom of the government mandating how you should take advantage of the opportunities that the digital revolution creates. I suspect you know better than the government what you should send."

In other words, if Hundt had his way the FCC would not *require* the industry to broadcast HDTV. A few months ago that would have

seemed like bad news, but now it was not so clear. The broadcasters' competitors—the Cable Mongols—were lining up to promise high-definition television service. When a magazine asked Amos Hostetter, the chairman of Continental Cablevision, the nation's third largest cable company, if he planned to offer HDTV, his answer was unhesitating. "Absolutely," he said. "I think it is going to be a significant competitive disadvantage for anybody who doesn't get there. The picture quality is discernibly superior. I think you'd pay a big price if you didn't introduce it. In the new competitive world, if you are a late adopter of new technology you're going to get passed by." Could the broadcasters really allow the Cable Mongols to offer a service they didn't have?

John Abel, of course, was the father of high-definition television in America. Everyone also knew that he had been working hard to abort his child from almost the day of conception. Even now, Abel barked while the rest of the industry moved on.

"This is the digital revolution," he grumbled, sitting alone with an interviewer in his small, windowless office on the second floor of the convention hall. "There are going to be all kinds of twists and turns ahead that we don't even know about yet." As for HDTV, "many things could forestall it still. This thing is not clear-cut at all. This could still be strung out for a very long time." Still, not even Abel could ignore the rumbling under his feet. "Production costs for HDTV have come down quite a lot," he admitted. "If the FCC issues a standard, I think at least three of the four networks will offer high-definition programming almost instantly."

Below Abel's office, on the convention floor, the broadcasters were proclaiming the new gospel with no hint of Abel's tight-throated tone. They were lining up to chant their new-old mantra. "Alone among our rivals," Jonathan Blake was saying once again, "we have to use government parceled-out spectrum to implement these new technologies. We preserved the spectrum in which to implement HDTV. But now all of this could be undone."

And from that, the rallying cry was reborn: If we are not allowed to offer high-definition television, that will bring *the death of local broadcasting as we know it!*

Module I

Overall Themes

Changing Government Role

- Changing Government Role: Monopoly Regulation to Promoting and Enforcing Groundrules for Competition.
- Telephony: Ma Bell Monopoly to Long Distance, Local, Wireless Competition
 - Traditional Common Carrier Regulation vs. Rules for Competitive Entry
- Broadcasting: 3 TV Networks to Full Array of Entertainment Options (MVPDs, VCRs, Internet etc.)
 - Trustee Role over Airwaves to Competitive Entertainment Market
- Cable Industry: One Franchise Per Community to Competition from LECs, Satellite TV etc.
 - Price and Access Regulation to Price Deregulation

New Government Role

Questions re New Government Role:

- i) How much regulation is needed initially to help spur competition?
- ii) As competition increases, how do we deal with “legacy” rules, i.e., how quickly should deregulation occur?
- iii) To the extent monopoly situations still exist in certain areas, what regulatory tools should be used?

Section 1 – Purpose of Act

For the purpose of regulating interstate . . . commerce
in communications by wire and radio so as to make
available . . . to all the people of the United States . . . a
rapid, efficient, Nation-wide . . . world-wide wire and
radio communication service with adequate facilities at
reasonable charges

Additional FCC Roles

- Spectrum Management and Licensing
- Universal Service
- Public Safety
- National Security
- Consumer Protection
- Access for the Disabled
- Public Interest Obligations in Broadcasting

Intergovernmental Coordination

- Working with Congress and Executive Branch agencies (NTIA, DOJ, USTR, State Dept.,).
- Working with State PUCs (e.g., local telephony) and Local Governments (e.g., cable franchises)
- Working with other Countries (e.g., opening communications markets for U.S. businesses abroad).
- All these roles are affected by the recognition of increasing competitive communications markets.

Move to Competitive Markets

- 1960's and 1970s - FCC and DC Circuit telephone equipment and long distance competition decisions. Broadcast industry facing competition from new cable model of delivering television signals.
- 1984 – DOJ antitrust case leading to divestiture of AT&T monopoly over both local and long distance telephony and telephone equipment. Public trustee role over broadcast content reconsidered.
- 1993 -- Congress gives FCC authority to auction off spectrum.
- 1996 Act – Major Congressional enactment promoting greater competition in telephony and video markets.
 - Assumes communications is not necessarily a natural monopoly.
 - Let everyone into everyone else's market to spur competition, and no Federal or state laws should prohibit entry.

International Markets

- 1997 WTO Agreement – 69 countries agree to open telecom markets and competitive principles.
- Post 1996 – FCC implements 1996 Act and works with other countries on similar market-opening and independent regulator provisions.

Importance of Communications Industry

- Why all the attention on communications industry?
- Major economic, social and political influence.
- First Amendment implications.

Effect of Changing Technology

- Other Changes: Digitalization, Convergence and the Rise of the Internet
- While the Internet is not directly regulated by the FCC, to the extent Internet traffic goes over the public switched telephone network or cable networks or wireless or satellite networks, and those networks are regulated or overseen to some degree by the FCC, our decisions on the underlying communications infrastructures and industries affect the Internet/information industry too.
- As each of these regulated communications industries offer similar services (e.g., Internet) many question whether historically different regulatory regimes still make sense.

Historically Different Regulatory Regimes

- For various reasons, the three main areas of communications industry have been regulated in different ways.
- **Telephony** – traditional common carriage/monopoly regulation, e.g., price regulation; entry and exit regulation; universal service requirements; accounting rules re cross-subsidization; interconnection requirements. FCC and states share regulatory responsibility. (Title II)
- **Broadcasting** – traditionally heavily regulated by FCC with respect to content and trustee role in using public airwaves. Many of these rules have been eliminated in recent years (e.g., fairness doctrine), but some new ones have arisen (e.g., children's educational television). (Title III)
- **Cable** – traditionally regulated as a local monopoly, with price and access regulation imposed by FCC and local governments. Recent deregulation as to prices, but still access issues (e.g., must carry of broadcast signals and public, educational and governmental access). (Title VI)

Post-1996 Deregulation

- **Telephony:** ILEC duties to open up their networks; BOCs ability to enter LD markets state by state if can prove have opened networks to competitors (14 point checklist); States cannot prohibit entry; FCC can “forbear” from regulating if market conditions are right; FCC must do biennial review of regulations every two years; FCC and states work together on local telephony, even though intrastate matters had been the domain of the states prior to this.
- **Cable** – FCC no longer regulating cable prices. Expectation that satellite tv providers and others (video telephony) will provide necessary competition.
- **Broadcasting** – FCC permitted to allow more consolidation in broadcast market in light of more competition from cable, VCRs, DBS and even newspapers and the Internet. Allows more radio and local tv station mergers and allows tv networks to reach more people in the U.S. through the amount of stations they owned.

1934 Communications Act

- 1934 Codified at Title 47 of U.S. Code – Includes 7 Titles
- Title I – general structure, jurisdiction and operation of FCC, including fee schedule.
- Titles IV & V – FCC enforcement jurisdiction, requirements for administrative proceedings, penalties and forfeitures for regulatory violations.
- Title VII – Miscellaneous provisions, including access by the disabled to communications networks.

FCC Organization

- FCC as an independent agency
- 5 Commissioners/1 Chairman
- Currently, 6 Bureaus:
 - Consumer & Governmental Affairs
 - Enforcement
 - International
 - Media
 - Wireless Telecommunications
 - Wireline Competition

FCC Actions

- Rulemakings
 - NOI
 - NPRM
 - FNPRM
 - ORDER
- Adjudications
- Licensing
- Fines and Forfeitures

Module II: Wireline Telephony

Early History of Telephone System

- Alexander Graham Bell invented in 1876.
- In 1870s and 1880s Bell had monopoly on telephone service and owned the patents.
- In 1890s the Bell patents were expiring and other companies entered the field.
 - But Bell did not allow rival companies to interconnect with it.
 - Bell acquired new patents on long distance technology (amplifiers that repeat signals over long distances).
 - Bell started buying up competitors.

Early History

- In 1913, Justice Dept. stepped in.
- Government sanctioned Bell monopoly over local and long distance.
 - Required Bell to interconnect, accept government regulation, and only buy other companies upon government consent.
 - Imposed common carrier regulation

Traditional Common Carrier Regulation

- Traditional govt. telecom regulation: rates, interconnection, entry and exit, cross-subsidization, universal service.
- Interstate regulated by FCC; intrastate regulated by States.
- Regulation over carrier to carrier and carrier to consumer relationships.

Section 201

- “It shall be the duty of every common carrier . . . to furnish such communication service upon reasonable request therefor; and . . . to establish physical connections with other carriers”
- “All charges for and in connection with such communication service, shall be just and reasonable”

Section 202

- “It shall be unlawful for any common carrier to make any unjust or unreasonable discrimination in charges . . . for or in connection with like communication service”

Traditional Telecom Regulation

- Rates: Rate of return regulation allows companies a reasonable rate of return on investments.
- States and FCC investigate whether rates are reasonable (sec. 201). Still doing this today.
- Tel. cos. file public tariffs containing rates.
- Govt. reviews and decides whether to suspend the tariffs or not.

Traditional Telecom Regulation

- Interconnection: FCC has authority to require a carrier to interconnect with other carriers at reasonable, nondiscriminatory rates. (Sec. 201 and 202)
- Govt. trying to prevent monopoly from unfairly preventing interconnection with rivals or doing it in a discriminatory way, e.g., favoring own network connections.

Traditional Telecom Regulation

- FCC has authority to control entry and exit into interstate market (sec. 214).

Traditional Telecom Regulation

- Cross Subsidization: Govt. tries to prevent monopolist from unfair competition by cross-subsidizing rates, e.g., charging higher rates to captive ratepayers in order to charge lower rates in competitive service.

Traditional Telecom Regulation

- Universal service regulation (good subsidies):
- “Separations” system needed so that FCC and states can allocate fixed costs of the telephone network to either local traffic or long distance traffic for purposes of universal service.
 - Residents subsidized by businesses
 - Rural subsidized by urban
 - Local rates subsidized by long distance rates
 - Lightly used routes subsidized by heavily used routes.

Beginnings of Competition

- Beginnings of competition (1960s/70s) started to emerge:
 - Customer Premises Equipment (CPE)
(Hushaphone and Carterphone)
 - Long distance (Execunet – MCI)
 - Computer/data processing services
(Computer II/III)

AT&T Divestiture

- 1984 breakup of AT&T by DOJ -- Modified Final Judgment (MFJ)/Consent Decree.
- Rationales: i) Discriminatory interconnection against rivals (e.g., Hushaphone and AT&T “protective connecting arrangements”); and ii) Cross-subsidization between AT&T’s competitive services (long distance) and regulated services (local).
 - DOJ claimed FCC could not monitor the books adequately and that accounting safeguards insufficient.

AT&T Divestiture

- Result: AT&T had to divest its local exchange monopolies and, in return, got to do competitive services (long distance, manufacturing telecom equipment, and providing info services).
- The resulting 7 RBOCs (22 BOCs) could only provide local tel service (line of business restrictions).
 - Nynex, SBC, BellSouth, Ameritech, Pac Bell, US West, Bell Atlantic

AT&T Divestiture

- Theory of Divestiture: BOCs could cross-sub and discriminate if got into those other businesses, as AT&T did.
- Concerned about bottleneck over access to local telephone lines.
- AT&T wouldn't have that bottleneck anymore, so less incentive to discriminate or engage in monopolistic activities.

AT&T Divestiture

- MFJ supposed to be reviewed every 3 years by DOJ and Judge Green.
- MFJ eventually led to 1996 Act.
- LATAs (local access and transport area) to help determine what is local and what is long distance (interLATA).
 - BOCs cannot provide interLATA service.

Post Divestiture Issues

- Different regulatory approaches to dealing with monopoly situation: structural rules (divestiture; line of business; separate subsidiary & separate books).
- Nonstructural approaches (stricter accounting rules, enforcement, incentive pricing).
- More competition – natural curb on monopolistic practices.
- 1996 Act combines these approaches.

Post-Divestiture Issues

- BOC provision of enhanced/info services (shift from structural to nonstructural rules)
 - Computer Cases (basic vs. enhanced services)
- Move to incentive pricing/price caps for largest telcos.
- Louisiana PSC v. FCC (1986) (reinforces dual regulatory scheme).
- Long Distance and Wireless Competition Emerging

Telecommunications Act of 1996

- 1996 Act – first major rewrite of 1934 Act in 62 years.
- Attempts to end the largest and most persistent monopoly in the communications industry – the local telephone bottleneck.

1996 Telecom Act

- Main idea – make ILECs share their network with competitors (CLECs). (Sec. 251)
- Once the FCC determines that an ILEC's network in a particular state is sufficiently open (according to a 14 point competitive checklist and other requirements) then FCC may allow that BOC into the LD market within that state. (Sec. 271)

1996 Telecom Act

- Four entry methods (section 251):
 - resell ILEC's services
 - lease unbundled network elements
 - build own facilities and interconnect
 - some combination of the above

Sec. 251(b) Obligations of LECs

- Resale
- Number Portability
- Dialing Parity
- Access to Rights-of-Way
- Reciprocal Compensation

Section 251(c) Obligations of ILECs

- Duty to negotiate in good faith
- Interconnection
- Unbundled Access
- Resale
- Notice of Changes
- Collocation

1996 Telecom Act

- Importance of pricing to competition: UNEs, resale, reciprocal compensation.
- States given the responsibility to approve specific interconnection agreements and to set just and reasonable rates for leasing UNEs, interconnection, and resale. (Sec. 252)
- Under Iowa v. FCC (Iowa I) (2000), the Supreme Court held that FCC could set pricing guidelines that the states must follow (called TELRIC).
 - Theory that new law specifically gives the FCC authority over local telephone competition, even though normally had been an intrastate matter (Iowa I vs. Louisiana).
 - Verizon vs. FCC (Iowa II) (2002), Supreme Court upheld TELRIC.

Telecom Act of 1996

- BOC entry into long distance (sec. 271).
 - 14 point competitive checklist
 - Separate sub requirement (sec. 272)
 - Summary of process in AT&T v. FCC (2000) (DC Cir) upholding Verizon NY 271 approval.
- FCC decides with input from DOJ and the relevant State, and writes an opinion in 90 days.
- 22 applications approved, a few pending.
- Importance of OSS (all aspects of customer interaction), performance measurements, standards, data validation, post-271 monitoring.
- Post-271 Monitoring and Enforcement

1996 Telecom Act

- Other Deregulatory Tools
 - Forbearance (sec. 10)
 - Biennial review (sec. 11)
 - Removal of barriers to entry (sec. 253)

1996 Telecom Act

- Another Major Change: Universal Service – Sec. 254
- Puts the term universal service into the statute and sets forth principles and “evolving” definition.
- Expanded definition of universal service to include access to advanced telecom services for schools, libraries, rural health care providers.
- Joint Board and FCC work together.
- Created USAC to help administer the USF
 - Lifeline and Linkup programs too.

Sec. 254 Universal Service Definition

- “Universal service is an evolving level of telecommunications services that the Commission shall establish periodically . . . taking into account advances in telecommunications and information technologies and services.”

1996 Telecom Act

- If introducing local competition, must deal with universal service subsidies and access charges.
- Before 1996 IXCs paid for univ service through access charges.
- Now, all interstate telecom carriers contribute, and ETCs get the distributions.
- On-going debate on how to access contributions – right now based on gross telecom revenues.
- Access charge reform proceeding

1996 Telecom Act

- Issues: Is this great experiment working? Can local telephone market be a competitive one to both residential and businesses? Is it reasonable to assume ILECs will open their networks or have enough incentives to do that?
- How much regulation needed at the front end? How quickly should deregulation occur?

Post 1996 Act

- After 1996 Act passed, FCC started rulemakings to implement the statute.
 - Local Competition
 - Universal Service
 - Access Reform
- Lots of litigation over pricing issues, how to interpret various terms, what should constitute a UNE
 - e.g., only a bottleneck element or must ILEC share element that is available on the competitive market, like switches?
 - Chevron (1984) analysis

Post 1996 Act

- States engaged in interconnection arbitrations and BOC 271 readiness
- Other countries emulating 1996 Act interconnection and unbundling rules
- Congress debating whether to fine-tune 1996 Act rules

Module III

Internet and Advanced Services

Advanced Services

- Advanced Services – Sec. 706
- FCC and each state shall encourage the deployment of advanced telecom capability on a reasonable and timely basis.
- Evolving definition: High speed, switched
- FCC 706 report

Advanced Services

- High speed – DSL; cable modum; wireless or satellite.
- Telecom vs. Information Service Distinction
- Not monopoly services; different regulatory regimes.
- FCC broadband proceedings

Advanced Services

- 4 approaches:
 - Monitor deployment
 - Deregulation (e.g., exempt advanced services from various rules, e.g., interLATA restriction, tax breaks)
 - Regulation (e.g., more unbundling)
 - Implement new regulatory regime for advanced services/harmonize

Advanced Services

- Is DSL telecom service that should be unbundled, and to what extent?
- Packet-switching decision
- Line Sharing decision
 - USTA v. FCC (D.C. Circuit 2002)
 - Effect on incentives

Module IV: Spectrum Policy

Radio Spectrum

- Radio Spectrum: Portion of our airwaves used for communications. Electronic messages sent via radio waves.
- Frequency: The number of times per second a radio wave undergoes a complete curve cycle.
 - kHz – 1,000 cycles per second. (AM radio broadcasts in the U.S. occupy frequencies between 535 kHz and 1605 khz.)
 - MHz - 1 million cycles per second. (FM radio broadcasts occur between 88 MHz and 108 MHz.)
 - GHz: 1 billion cycles per second (satellite transmissions).

Radio Spectrum

- Bandwidth: the extent of spectrum a signal occupies. More bandwidth is necessary to carry a color tv signal than to carry the human voice.
- Any particular frequency could be suitable for several competing uses, so even though a frequency assigned to tv or radio broadcasting, could possibly also be used for wireless services, if engineering and technical qualities are correct.

Domestic Frequency Allocation Process

- International Telecommunications Union (ITU)
- FCC Role: Administers use of the spectrum by all non-Federal users: private commercial and noncommercial uses, local, state, and county government users
- NTIA Role: Administers federal govt. use, including DOD, with assistance from Interdepartment Radio Advisory Committee (IRAC)
- While some bands are exclusive, many bands are shared between fed govt. and non-fed govt users.

Domestic Frequency Allocation Process

- *Spectrum allocation*: Setting aside bands or blocks of frequencies for particular uses, e.g., fixed, land mobile, maritime, broadcasting.
- *Spectrum allotment*: Deciding which group of users will use which subset of frequencies within a block allocation, e.g., a block of land mobile spectrum may be divided among police or fire safety users, taxicabs, and cellular telephone users.
- *Spectrum assignment*: Issuing individual licenses to particular individuals or entities to operate over a specific frequency band in a particular part of the country.

Early History

- Radio Act of 1912 and Radio Act of 1927:
 - 1912 Titanic Disaster
 - Fed govt. takes over spectrum management
 - Fed govt. allocates use among private and government users, with emergency and military needs taking precedence.
 - Airwaves are a scarce public resource licensed for private use under a public interest standard
 - Licenses awarded for free.
 - Cannot broadcast without a license
- 1934 Communications Act: Combines elements of the Radio Act of 1927 in Title III and elements of ICC common carrier regulation in Title II.

Evolution of Licensing

- Merit-based
- Comparative hearings
- Lotteries
- Auction System

Policy Changes

- Spectrum Flexibility
- Spectrum Scarcity
 - Technological Change Due to Digitalization
- Secondary Markets Initiative
- Evolving Public Interest Standard
 - Effect of Increased Entertainment Choices
 - Difference with Telephony
 - Effect of Auctions
 - Transition to Digital Television

Module V: Wireless Telephony

General Industry Organization

- Federal government (NTIA) vs. Non-Federal Government (FCC) uses
- Licensed or unlicensed (Part 69)
- Fixed or mobile
- Commercial (CMRS) or Private (PMRS)

General Industry Organization

- 1st Generation: Wireless device either provided telephone or paging service
- 2nd Generation: Wireless device provides a variety of telephony & data services (PCS service)
- 3rd Generation: Wireless devices designed for multimedia services, e.g., wireless Internet

Regulatory History

- 1980's: FCC divided available spectrum into two blocks in various market areas – one for local wireline telcos and other for nonwireline companies
 - Created duopoly situation
- Mid-1990's – FCC uses auction authority to allocate additional PCS licenses
 - Successfully inserts more competition into wireless services
- FCC and NTIA currently working on finding spectrum for 3G wireless services

Legal Overview

- In 1993 Budget Act, Congress amended section 332 of Title III to establish comprehensive scheme for the regulation of mobile wireless providers.
 - CMRS vs. PMRS
 - States generally preempted from rate and entry regulation of CMRS or PMRS providers
 - CMRS subject to Title II requirements (e.g., reasonable rates, interconnection, universal service), unless FCC forbears based on competitive conditions
 - Buildout and service requirements

Hot Issues

- 3G Spectrum Issues/Relocation of Current Users
- Extent of Regulation in Competitive Wireless Market (often 5 or more providers in many markets)
- Phasing Out of Spectrum Cap
- E911 and Public Safety Users
- Nextwave Bankruptcy Issues
- Wireless Siting Issues

Module VI: Media Industry

Broadcasting

Characteristics of Broadcasting

- Mass Media vs. Common Carrier Regulation
 - Broadcasters not common carriers – don't make a public offering for a fee to communicate others messages. Rather, decide own message and raise money through advertisement.
- Nature of public interest
 - Telephony: Public interest involves competition and universal service issues.
 - Broadcasting: Public interest involves competition, diversity, localism, First Amendment issues.
- Content regulation

Evolution of Public Interest Standard in Broadcasting

- Changing public interest standard in a world of multiple channel competition and other sources of content (Internet, videos, cable, DBS) than when only three major tv broadcast stations and limited radio stations.
 - As market and technology created more competition, the traditional notions of what is in the public interest, and what, if anything, the government should do about it, are being challenged.
- Content regulation receding as more competition and voices available; not as concerned (although still some concern) over limited availability of outlets.

Broadcast Licensing

- Traditionally, FCC allocated licenses according to the needs of the public interest, convenience and necessity (Sec. 307).
- FCC gave out licenses for free, but content of the broadcast had to be in the public interest.
 - This gave FCC a lot of power to determine who got a license and what would be broadcast in a particular community.

Broadcast Licensing

- Initial License
 - FCC would look at a variety of criteria under the public interest standard: e.g., the community's need for an additional station, the likelihood of interference with other stations, the character, experience and financial strength of the applicant, etc.
- Mutually Exclusive Applications/Comparative Hearings
 - Ashbacker (U.S. 1945) required hearings
 - Hearings took a lot of time and resources.
 - FCC tried to come up with objective criteria to weigh relative merits of the applications, but often those criteria came under attack in court as arbitrary
- License Renewals/Comparative Hearings
 - 1996 Act gives presumption to renewal (Sec. 309(k)).
- License Transfers
 - FCC approval required

Evolution of Licensing

- Lotteries (1980s): Produced too many arbitrary applicants and speculative behavior
- Auctions:
 - 1993 Budget Act: Gave FCC auction authority in certain limited areas (not broadcasting).
 - 1997 Budget Act: FCC's auction authority expanded for almost all licenses except broadcast DTV licenses and noncommercial education and certain public safety services.
 - Theory: License goes to the party that values it the highest. Most efficient use of the spectrum. Govt. recoups value of the spectrum.



Public Trustee Obligations: Access to the Airwaves

- Red Lion (U.S. 1969): Govt. can regulate the broadcast industry more heavily than other communications industries when it comes to access to the airwaves.
 - Contrast with newspapers and cable
 - Upheld FCC “fairness doctrine,” which required broadcasters to air controversial views and allow community to respond.
- Rationale: Since spectrum is scarce, broadcasters must operate on behalf of the public.
- FCC eliminated fairness doctrine in 1980’s, but Red Lion, and heavier regulation of broadcasters, still good law.
 - Fairness doctrine was no longer in the public interest since it “chilled” more speech than it produced
- Political Advertising rules still apply – guaranteed access, equal time and rate rules (secs. 312 and 315).

Public Trustee Obligations: Indecent Material on the Airwaves

- FCC v. Pacifica (U.S. 1978) (George Carlin's 7 dirty words). Govt. can restrict public broadcast of indecency.
 - Obscenity has no protection; indecency has some social value.
- Rationale: Broadcast media has uniquely pervasive presence in our lives and is uniquely accessible to children.
- Later case upheld FCC restriction of indecent material to between 10 p.m. – 6 a.m.
- Contrast with cable (pay tv and lock box); telephony (1-900 messages need credit card); Internet (ACLU v. Reno, U.S. 1997); print media.

Other Public Trustee Obligations

- Violence: 1996 Act V-Chip required in tv sets and “voluntary” program ratings.
- Children’s Educational TV: FCC requires 3 hours per week (CTV Act of 1990).
- Other public interest obligations: Advertising requirements; equal opportunity requirements in hiring; record-keeping rules; emergency broadcast information; access for persons with disabilities such as closed captioning.

Digital Television

- Transition from analog to digital television standard
 - Potential for many new services via tv set (e.g., interactivity, wireless services, higher quality picture, more programs per channel, customized tv, subscription video, etc.).
- Additional DTV Spectrum Given to Incumbent Broadcasters for Free during Transition
- Spectrum to be returned in 2006 for reauction, unless 15% of households in a given market are not receiving DTV signals.

Digital Television

- Broadcaster flexibility and ancillary services
 - Broadcasters must use their DTV frequency to broadcast at least one tv channel in ATV, but doesn't have to be HDTV.
 - Extra spectrum could be used for “ancillary” services, with 5% of revenues to be paid back to FCC
- New consumer equipment needed
 - Demand and supply questions
 - Compatibility with other media (cable, satellite, videos, etc.)
 - Need for intellectual property protection in digital format

Digital Television

- Digital Must Carry Issue
 - During the transition, does cable need to carry both analog and digital broadcast signals?
 - Cable says no, too burdensome; broadcast says yes to help transition.
- New “digital-era” public interest rules?
 - Statute says broadcasters still have public interest requirements, but how apply in multichannel and multiservice environment?
 - E.g., If broadcaster airs more than one ATV channel, would CTV rules apply to all? Should politicians have access to all channels? Obligations on ancillary services? Since got the spectrum for free, should more public interest obligations apply? Should some of the extra spectrum be set aside for public access? Should part of the 5% revenues go to public service initiatives?

Broadcast Ownership

- Trying to use structural rules to accomplish goals of diversity, competition, and localism.
 - Rationale: If limit the number of tv stations one entity can own in a certain market, then the result will be more diversity of content.
- Rules change a lot, FCC grants lots of waivers, and lots of recent cases remanded to FCC for better analysis.
- 1996 Act major catalyst for deregulation of broadcast ownership rules both by statute and by requirement of biennial review (and justification) of these rules.

- Different philosophies:

- Ownership rules not needed: Greater competition, multiple content outlets, and the backstop of antitrust enforcement reduces need for arbitrary, upfront rules; relaxing the rules increases efficiencies of joint operations
- Ownership rules still needed: Multiple choices in media outlets is not the same as multiple independent voices; still have to address impact of consolidation on diversity, competition, and localism; antitrust litigation after the fact more expensive and difficult than a prophylactic rule ahead of time.

Broadcast Ownership

- **Multiple Ownership Rules:**

- *Radio Stations:* Local radio ownership rules limit the number of radio stations one entity may own in a single radio market (under FCC review);
- *Television Stations:*
 - **Local tv ownership rules** limit the number of tv stations one entity may own in a single tv market based on other independent broadcast stations (remanded by Sinclair (D.C. Circuit 2002))
 - **National tv ownership rule** prohibits an entity from owning tv stations that would result in an aggregate national audience reach exceeding a certain percentage (35% remanded by Fox Television (D.C. Circuit 2002))
- *Networks:* Dual network rule states that two major networks (of the four) may not merge, but can acquire one of the minor networks, e.g., UPN, WB, Paxson (FCC Biennial Review)

Broadcast Ownership

- **Cross Ownership Rules:**

- *Radio-tv cross ownership rule:* Limits the number of radio and tv station combinations that one entity may own in a single market based on other “independent” voices in that market (FCC 2002 Biennial Review)
- *Daily newspaper/broadcast cross-ownership rule:* Restricts ownership of both in the same community (so can report on each other) (under FCC review)
- *Local cable/local tv cross-ownership rule:* (vacated by Fox Television (D.C. Circuit 2002))

Overall Themes - Cable

- Dual Regulation
 - Sometimes like telephony (e.g., rate regulation), sometimes like broadcast industry (e.g., ownership rules)
 - Federal Government and Local Franchise Authorities
- Gatekeeper Role
- Treatment of “new” competitor
- Broadcast-Cable Relationship
- Swing between regulation & deregulation
 - 1984 Cable Act; 1992 Cable Act; 1996 Telecom Act

Regulatory History

- Cable tv started as retransmission of broadcast signals to areas of poor tv reception.
 - Started with local signal retransmission
 - Then distant signal retransmission
 - Then cable content (HBO, Discovery Channel)

Cable History

- While local broadcaster may benefit from having it's signal more widely transmitted (larger audience = more advertising revenues), concerned about:
 - retransmission of distant signal into local market;
 - potential to carry some local stations but not others;
 - no payment for retransmission of entire signal or underlying program
- Broadcasters asked FCC to intervene to address these issues.

Cable History-Jurisdiction

- FCC Authority to Regulate Cable:
 - Southwestern Cable (U.S. 1968): FCC rules upheld as “reasonably ancillary to regulation of broadcast.” (Title I)
 - 1984 and 1992 Cable Acts gave FCC explicit authority (Title VI)

Cable History - Jurisdiction

- Local Franchise Requirements:
 - Annual franchise fee
 - Technical requirements
 - Financial requirements
 - No more exclusive franchises

Cable Carriage Issues

- 1992 Cable Act: Cable operator must obtain a station's consent before its tv signal can be carried either through:
 - Retransmission Consent Negotiations
 - Must Carry without charge
- Carriage rules upheld by Turner I (U.S. 1994) and Turner II (U.S. 1997)
 - Preserve free over-the-air tv
 - Concern about monopoly gatekeeper role
- Application to digital television and DBS



Nonduplication Rules

- Broadcaster with exclusive rights to air particular programming can prevent the cable operator from retransmitting that program from another station.
 - Network programs
 - Syndicated (non-network) programs
 - Certain sports coverage
- Application to digital tv and DBS

Channel Set-Asides

- 1992 Cable Act permits LFA's to require large cable operators to set-aside a certain number of channels for i) public, educational, or governmental (PEG) use; and ii) commercial leased access by unaffiliated firms.
 - Upheld in Time Warner vs. FCC (D.C. Circuit 1996) as appropriate content neutral regulation to promote diversity of viewpoint for the public.
- Application to digital tv and DBS

Cable Rates

- Pre 1984: LFA's regulated cable rates
- 1984 Cable Act: Used FCC to deregulate cable rates
 - Effective competition standard = 3 tv stations
- 1984-1992: Cable rates went up
- 1992 Cable Act: Used FCC to reimpose rate regulation based on "tiers"
 - LFA's regulated basic tier based on FCC formulas
 - FCC could hear complaints re higher priced tiers
- 1996 Telecom Act: Repealed FCC rate regulation of upper level tiers
 - Expectation of DBS competition to keep rates low

Pole Attachments Act

- FCC is authorized to ensure that the rates, terms and conditions imposed by utilities on cable operators and telecom providers to attach wires to utilities' poles are just and reasonable, and that access is provided in a nondiscriminatory manner.
- Supreme Court in 2002 said that the FCC has authority under the Pole Attachments Act to regulate rates whether the attachments are being used for traditional cable or telecom services or for high speed services or wireless services.



First Amendment Issues

- Cable regulated differently:
 - No spectrum scarcity issue like broadcasters
 - Even though can be a monopolist, that does not necessarily justify content regulation (same with newspapers).
- Can regulate in content neutral manner (O'Brien test) if it:
 - furthers an important govt. interest
 - the restriction is no greater than essential

First Amendment Issues

- Time Warner vs. FCC (D.C.Cir. 1996): Upheld PEG and commercial leased access rules (content neutral)
- Turner I (U.S. 1994) and Turner II (U.S. 1997): upheld must carry and retransmission consent rules (content neutral)
 - DBS must carry recently upheld on same basis
- U.S. vs. Playboy (U.S. 2000): struck down time channeling requirement for cable indecency as overbroad (content-based)
- Future Issue: Digital Must Carry

Cable Ownership

- *Horizontal Ownership/Subscribership Limit:* 1996 Act directs the FCC to set limits on the number of subscribers any cable operator may obtain nationwide
 - 30% MVPD rule struck down by Time Warner v. FCC (2001 D.C. Cir) and under FCC review
- *Vertical Ownership/Channel Occupancy Rule:* 1996 Act directs the FCC to set rules for the amount of affiliated programming cable systems can carry
 - 40% rule struck down by Time Warner v. FCC (2001 D.C. Cir.) and under FCC review

Cable Ownership

- *Local cable station/local broadcast station cross ownership restriction: (vacated by Fox Television (D.C. Circuit 2002))*
- *Program Access Rules: 1996 Act prohibits unfair or discriminatory practices in the sale of programming to other MVPDs, particularly DBS.*
 - Also bans exclusive programming contracts
 - Issue: Are these rules redundant?

Cable Provision of Broadband

- FCC had determined telephone company provision of DSL high speed internet service to be subject to sec. 251 unbundling
- Consumers wanted similar “open access” conditions imposed on cable modem service to pick their own ISPs
 - Cable had bundled the Internet access service with the high speed transmission service as one service, for one price
 - Issue raised a lot in AT&T/MediaOne merger and AOL/Time Warner merger

Cable Provision of Broadband

- FCC NOI (2000): Is Cable Modem High Speed Internet Service a cable service (subject to LFA open access requirements), a telecom service (subject to sec. 251 unbundling), or an information service (generally unregulated)?
 - Court cases had held differently

Cable Provision of Broadband

- AOL/Time Warner merger: FTC and FCC negotiated certain open access conditions prior to the merger approval
- FCC Broadband Proceedings: Looking at regulatory treatment of broadband service by both cable and wireline providers

Module VI: Media

Direct Broadcast Satellite Service

- Network of satellites transmits programming directly to subscribers' homes
 - Uses very high powered signal that can be received by relatively small and inexpensive home satellite dishes
 - Provides hundreds of channels to subscribers

Early Regulatory History

- FCC authorized DBS service in the late 1980s, first satellites launched in 1993, and DBS started providing service in 1994
- 1988 Satellite Home Viewers Act (SHVA) allowed DBS providers to deliver *network* programming to certain households “unserved” by either tv or cable.
 - Originally oriented towards rural areas

Regulatory History - DBS

- In later 1990s, DBS wanted permission to retransmit local station's signals (as well as network signals), to become viable competitor to cable.
- Also, CBS v. Primetime (S.D. Fla. 1998) case finding that Primetime had violated "unserved" requirement threatened cancellation of DBS service to over 2 million subscribers.

DBS – Regulatory History

- 1999 Satellite Home Viewer Improvement Act (SHVIA)
 - Expands definition of “unserved”
 - Authorizes DBS to provide local-into-local service
 - Imposes must carry requirements on DBS
- Issues:
 - Echostar/DirecTV merger
 - MVPD competition/rates
 - Regulatory parity with cable