Order Code RL31260

Report for Congress

Digital Television: An Overview

Updated June 13, 2002

Lennard G. Kruger
Specialist in Science and Technology
Resources, Science, and Industry

Digital Television: An Overview

Summary

Digital television (DTV) is a new television service representing the most significant development in television technology since the advent of color television in the 1950s. DTV can provide sharper pictures, a wider screen, CD-quality sound, better color rendition, and other new services currently being developed. The nationwide deployment of digital television is a complex and multifaceted enterprise. A successful deployment requires: the development by content providers of compelling digital programming; the delivery of digital signals to consumers by broadcast television stations, as well as cable and satellite television systems; and the widespread purchase and adoption by consumers of digital television equipment.

Congress and the Federal Communications Commission (FCC) have set a target date of 2006 for broadcasters to cease broadcasting their analog signals and return their existing analog television spectrum licenses to be auctioned or used for other purposes. While the nation's transition to digital television is proceeding, most observers believe that widespread adoption of DTVs by consumers will not be achieved by 2006, and that television stations will continue to broadcast both analog and digital signals past the 2006 deadline. The key issue for Congress and the FCC is: what steps, if any, should be taken by government to further facilitate a timely, efficient, and equitable transition to digital television? To address this question, Congress and the FCC must confront a highly complex policy landscape, involving different industries, technologies, and interests, including: content providers, commercial and noncommercial television broadcasters, cable and satellite television providers, consumer electronics manufacturers and retailers, and consumers.

No major legislation has yet been introduced into the 107th Congress directly related to digital television. However, Congressional committees are keenly monitoring the pace and progress of the digital transition. A number of options for Congressional action have been proposed. These include: mandating digital tuners; mandating dual carriage of digital and analog programming; accelerating the vacating of analog television spectrum; legislating a process whereby interoperability standards and copyright protection technologies will be implemented; and extending, strengthening, and/or altering the transition deadlines. While stakeholders are working to resolve some of these issues, pressure is building on the Congress to act as the DTV transition deadlines become closer.

Contents

List of Tables

Digital Television: An Overview

What is Digital Television?

Digital television (DTV) is a new television service representing the most significant development in television technology since the advent of color television in the 1950s. DTV can provide sharper pictures, a wider screen, CD-quality sound, better color rendition, multiple video programming or a single program of high definition television (HDTV), and other new services currently being developed. DTV can be HDTV, or the simultaneous transmission of multiple programs of standard definition television (SDTV), which is a lesser quality picture than HDTV but significantly better than today's television. Or, alternately, DTV could deliver as part of a multiple offering, some other service such as the distribution of text or data (for example, electronic newspapers or stock quotes) or even a high speed connection to the Internet.

There are three major components of DTV service that must be present in order for consumers to enjoy a fully realized "high definition" television viewing experience. *First*, digital programming must be available. Digital programming is content produced with digital cameras and other digital production equipment. Such equipment is distinct from what is currently used to produce conventional analog programming. *Second*, digital programming must be delivered to the consumer via a digital signal. Digital signals can be broadcast over the airwaves (requiring new transmission towers or DTV antennas on existing towers), transmitted by cable or satellite television technology, or delivered by a prerecorded source such as a digital video disc (DVD).[1] And *third*, consumers must have a digital television product capable of receiving the digital signal and displaying digital programming on their television screens. To receive digital broadcast signals, consumers can buy digital monitors accompanied with a set-top converter box (a digital tuner),[2] or alternatively, an integrated digital television with digital tuning capability already built in.

Role of Congress and the FCC

Congress and the Federal Communications Commission (FCC) have played major roles in the development of DTV. Starting in 1987, the FCC launched a decade-long series of proceedings exploring the potential and feasibility of a transition from conventional analog televisions to advanced television systems.

---

[1]At present, commercially available DVD technology does not deliver digital programming.

[2]Set-top converter boxes can also be used to enable conventional analog televisions to receive digital signals over the air. However, analog televisions hooked up to digital tuners cannot display high definition pictures.

While the original term used to describe the new television system was high definition television (HDTV), the FCC used a broader term – advanced television (ATV) – referring to any television technology that provides improved audio and video quality. After it became clear that ATV would be using digital signal transmission, the FCC began (in 1995) to use the term DTV (synonymous with ATV) to describe the new service more accurately.

In December 1996, after lengthy debate between television manufacturers, broadcasters, and computer firms, the FCC adopted a standard for DTV signal transmission based on recommendations of the Advanced Television System Committee (ATSC).[3] The ATSC standard allows for 18 different video formats, of which four have subsequently been adopted for commercial use.[4]

Meanwhile, the Telecommunications Act of 1996 (P.L. 104-104) provided that initial eligibility for any DTV licenses issued by the FCC should be limited to existing broadcasters. Broadcasters would be issued DTV licenses while at the same time retaining their existing analog licenses during the transition from analog to digital television. The Act provided that broadcasters must eventually return either their existing analog channel or the new digital channel. Also in the 104th Congress, a major debate took place over whether to direct the FCC to conduct auctions for the spectrum allocated for DTV. The FCC estimated the commercial value of the DTV spectrum to be between $11 billion to $70 billion. No legislation was enacted, however, and the FCC did not obtain the authority to auction the DTV licenses.

In 1997, the FCC adopted rules[5] to implement the Telecommunications Act, and granted DTV licenses to some 1600 full power incumbent television broadcasters. The DTV licenses consist of 6 megahertz (MHz) of unused spectrum within the VHF and UHF frequency bands. Because DTV signals cannot be received through the existing analog television broadcasting system (known as NTSC[6]) the FCC decided to phase in DTV over a period of years, so that consumers would not have to immediately purchase new digital television sets or converters. Thus, broadcasters were given 6 MHz of new spectrum for digital signals, while retaining their existing

---

[3]*FCC Fourth Report and Order In the Matter of Advanced Television Systems and Their Impact on Existing Television Service*, MM Docket No. 87-268, FCC 96-493, released December 27, 1996.

[4]Four video formats are being used commercially by U.S. television producers and manufacturers. These four formats are described by the number of lines they produce per each picture frame, and whether they use interlaced (i) or progressive (p) scanning techniques. These are: 480i and 480p (suitable for SDTV broadcasts), and 720p and 1080i (HDTV). The progressive scan video format is more compatible with PC displays, while the interlaced scan is more compatible with analog television receivers.

[5]*FCC Fifth Report and Order In the Matter of Advanced Television Systems and Their Impact on Existing Television Service*, MM Docket No. 87-268, FCC 97-116, released April 21, 1997.

[6]The National Television Systems Committee (NTSC) was the industry group that developed the currently used U.S. television standards. For a discussion of the difference between analog and digital signals, see CRS Report 96-401 SPR, *Telecommunications Signal Transmission: Analog vs. Digital*.

6 MHz for analog transmission so that they can simultaneously transmit NTSC and DTV signals to their broadcasting market areas.[7] The simultaneous broadcasting ("simulcasting") of the same programs in both digital and analog modes was intended to allow viewers who have not yet purchased DTV sets or converters to continue to receive television programming during the transition to DTV.

The ruling required television stations receiving the DTV licenses to build their DTV facilities according to a schedule determined by the size of their markets. Table 1 shows the time line established by the FCC for DTV conversion. The FCC can grant extensions to licensees unable to meet the schedule due to unforeseeable or uncontrollable circumstances, such as an inability to secure tower locations for new antennas.

Table 1. Digital Conversion Schedule for Television Stations

Stations	Conversion Deadline
affiliates of the four major networks in the top 10 markets.[8]	May 1, 1999
affiliates in markets 11-30	November 1, 1999
rest of all commercial television stations in the smaller markets	May 1, 2002
noncommercial television stations	May 1, 2003

The FCC set a target date of 2006 for broadcasters to cease broadcasting the analog signal and return their existing analog television spectrum licenses to be auctioned for other commercial purposes. During the 105th Congress, the Balanced Budget Act of 1997 (P.L. 105-33) made the 2006 reversion date statutory, providing that a "broadcast license that authorizes analog television service may not be renewed to authorize such service for a period that extends beyond December 31, 2006." However, the Act requires the FCC to grant extensions for reclaiming the analog television licenses in the year 2006 from stations in television markets where any one of the following three conditions exist:

- if one or more of the television stations affiliated with the four national networks are not broadcasting a digital television signal;

---

[7]Using digital technology, the DTV frequencies can be placed in the vacant portion of the same spectrum band currently allocated for analog (NTSC) television without interfering with analog television broadcasts. For background information on radiofrequency spectrum, see CRS Report RL30829, *Radiofrequency Spectrum Management: Background, Status, and Current Issues*.

[8]The top ten television markets (in terms of advertising revenue), in order, are New York, Los Angeles, Chicago, Philadelphia, San Francisco-Oakland, Boston, Dallas-Fort Worth, Washington DC, Atlanta, and Detroit.

- if digital-to-analog converter technology is not generally available in the market of the licensee; or

- if at least 15% of the television households in the market served by the station do not subscribe to a digital "multi-channel video programming distributor" (including cable or satellite services) and do not have digital TV sets or converters.

The FCC continues to monitor the status of the DTV conversion of both commercial and noncommercial broadcast stations. On October 11, 2001, FCC Chairman Michael Powell announced the creation of an FCC Digital Television (DTV) Task Force to review the ongoing transition to DTV, and to make recommendations on how to facilitate the transition and promote the rapid recovery of broadcast spectrum for other uses.

Ongoing DTV-related FCC activities and proceedings are presented in Table 2. The FCC is issuing periodic progress reports on the DTV buildout,[9] and has the option of granting deadline extensions to broadcasters. On November 8, 2001, the FCC announced it would modify a number of its DTV transition rules, in order to facilitate and speed the DTV transition. The changes permit stations to initially build lower-powered (and less expensive) DTV facilities, while retaining their option to expand their coverage area as the digital transition progresses. Meanwhile, the FCC declined to issue a blanket extension of remaining DTV construction deadlines. However, the FCC will consider, in limited circumstances, individual requests for extensions due to financial hardship. Specifically:

> Stations seeking an extension of time to construct DTV facilities on this basis must provide detailed evidence that the cost of meeting the minimum buildout requirements exceeds the station's financial resources . . . a brief downturn in the economy or advertising revenues will not be considered a sufficient showing of financial hardship. Rather, the showing must reflect the particular station's financial status over an economically significant period of time. In addition, the applicant must provide detailed evidence of its good faith efforts to met the deadline, including its efforts to obtain the necessary financing.[10]

Approximately three-quarters of the 1,240 full-power commercial stations in the United States did not meet the May 1, 2002 conversion deadline.[11] Most have received (or will likely receive) six-month deadline extensions from the FCC. On May 16, 2002, the FCC adopted a Notice of Proposed Rulemaking (NPRM) which

---

[9]The most recent progress report is contained in: *FCC Report and Order and Further Notice of Proposed Rule Making, In the Matter of Review of the Commission's Rules and Policies Affecting the Conversion To Digital Television*, MM Docket No. 00-39, FCC 01-24, January 19, 2001, p. 4-6.

[10]FCC News Release, "FCC Acts to Expedite DTV Transition and Clarify DTV Buildout Rules, November 8, 2001.

[11]See: General Accounting Office, *Telecommunications: Many Broadcasters Will Not Meet May 2002 Digital Television Deadline*, GAO-02-466, April 2002.

proposes increasingly severe sanctions every six months on stations who have not constructed digital facilities and do not demonstrate that their failure to do so was either unforeseeable, beyond their control, or due to legitimate financial hardship. Sanctions progress from admonishment, to issuance of a notice of apparent liability for forfeiture, to rescission of the station's DTV license.[12]

Meanwhile, a provision in the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (H.R. 3448, H.Rept. 107-481) addresses the digital conversion of full power television stations that received their analog licenses *after* the FCC allocated digital spectrum to existing analog stations in 1997. Section 531 of H.R. 3448 requires the FCC to allot a digital channel to any requesting full-power television station that had an application pending for an analog television station construction permit as of October 24, 1991, and which had its application granted after April 3, 1997. Any station receiving digital spectrum under this provision is required to complete construction of its digital facility within 18 months, without the possibility of an extension. Stations are also prohibited from operating an analog signal on its designated digital channel. The bill's conference report states that this provision will allow recent broadcast licensees to foster a digital audience during the transition period to digital television without having to terminate analog service, and that without this change, those stations would be denied the flexibility to operate an analog and a digital facility simultaneously in the near term, especially in major markets.

[12]See: [http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-222561A4.pdf]

Table 2. Recent FCC Proceedings Related to Digital Television

In the matter of:	Type of Action	FCC and Docket Number
Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television	Memorandum Opinion and Order on Reconsideration	FCC-01-330[13] MM Docket No. 00-39 November 15, 2001
Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television (includes FNPRM on digital tuners)	Report and Order and Further Notice of Proposed Rule Making (FNPRM)	FCC-01-24[14] MM Docket No. 00-39 January 19, 2001
Carriage of Digital Television Broadcast Signals	First Report and Order and FNPRM	FCC-01-22[15] CS Docket No. 98-120 January 23, 2001
Commercial Availability of Navigation Devices	FNPRM and Declaratory Ruling	FCC-00-341[16] CS Docket No. 97-80 September 18, 2000
Compatibility Between Cable Systems and Consumer Electronics Equipment	Report and Order	FCC-00-342[17] PP Docket No. 00-67 September 15, 2000
Nondiscrimination in the Distribution of Interactive Television Services Over Cable	Notice of Inquiry	FCC-01-15[18] CS Docket No. 01-7 January 18, 2001
Remedial Steps for Failure to Comply With Digital Television Construction Schedule	Notice of Proposed Rulemaking	FCC-02-150 MM Docket No. 02-113 May 16, 2002[19]

Status of the DTV Buildout

The nationwide buildout of digital television is a complex and multifaceted enterprise. A successful buildout requires: the development by content providers of compelling digital programming; the delivery of digital signals to consumers by

---

[13][http://www.fcc.gov/Bureaus/Mass_Media/Orders/2001/fcc01330.pdf]

[14][http://www.fcc.gov/Bureaus/Mass_Media/Orders/2001/fcc01024.pdf]

[15][http://www.fcc.gov/Bureaus/Cable/Orders/2001/fcc01022.pdf]

[16][http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-00-341A1.pdf]

[17][http://www.fcc.gov/Bureaus/OPP/Orders/2000/fcc00342.pdf]

[18][http://www.fcc.gov/Bureaus/Cable/Notices/2001/fcc01015.pdf]

[19]http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-02-150A1.pdf

broadcast television stations, as well as cable and satellite television systems; and the widespread purchase and adoption by consumers of digital television equipment.

Creation of Digital Programming. Digital programming is created with digital cameras and other digital production equipment. Digital content tends to favor more "visual" types of programming – such as sports events or movies – which take full advantage of the high-definition viewing experience. Currently, the amount of available digital programming is limited, but gradually becoming more widespread. Among broadcast networks, CBS produces the largest amount, with digital high-definition broadcasts available in all of its prime time scripted entertainment series during the 2001-2002 series. ABC is offering HDTV broadcasts in 60% of its prime time schedule.[20] PBS has also been active, producing digital programming as well as offering multicasts over digital channels in some local markets. NBC and FOX are starting to offer digital programming as well, and a number of local television stations have begun offering their evening news in a high definition format. Among cable networks, HBO currently offers the most amount of digital programming. Other cable networks producing digital programming include Showtime, A&E, Discovery, and Madison Square Garden.[21]

Two factors generally inhibit content providers from accelerating the production of digital programming. First, because relatively few households have digital televisions, networks have a diminished incentive to invest the money to produce digital content. Much digital programming is being produced by networks in sponsorship/partnership with consumer electronics companies who manufacture digital televisions. Second, content providers (e.g. networks and movie studios) are reluctant to provide digital programming until a digital copyright standard is in place (see discussion below, under "Issues").

Delivery of Digital Signals. Currently, there are three ways digital programming is being delivered to consumers. Digital signals are: 1) broadcast over the airwaves; 2) transmitted over a few channels provided by satellite television systems; and 3) provided via digital cable service in a very small number of markets.

Broadcasting. According to the National Association of Broadcasters (NAB), as of June 4, 2002, there were 422 stations (both commercial and public) broadcasting digital signals in markets.[22] This represents about 26% of the nation's approximately 1600 television stations. On the other hand, the 128 markets currently receiving digital transmissions cover about 87% of U.S. TV households. Television stations must construct new facilities and purchase new equipment in order to transmit digital signals. According to NAB, costs range from $8-10 million to fully

---

[20]National Association of Broadcasters, *Destination Digital TV*, October 22, 2001, Vol. 1, No. 4, p. 1.

[21]Cable & Telecommunications Overview, 2001, June 2001, National Cable Television Association.

[22]For latest statistics, see: [http://www.nab.org/newsroom/issues/digitaltv/dtvstations.asp]

convert a station to digital operation.[23] The FCC has granted construction permits to 1415 stations, about 84% of the total number of DTV allotments.[24]

Approximately three-quarters of the 1,240 full-power commercial stations did not meet the May 1, 2002 conversion deadline. As of May 8, 2002, 909 commercial stations have requested from the FCC an extension of the May 2002 deadline in order to complete construction of their DTV facilities. So far, 525 have been granted and 61 have been dismissed.[25]

Satellite. There are two direct broadcast satellite (DBS) television services available in the United States: Echostar's DISH Network and Hughes' DirecTV.[26] Both offer a few channels of HDTV programming. To date, DirecTV has a channel of HBO and a channel of pay-per-view (movies and events) in HDTV format. DirecTV has launched an HDTV sports channel, with the goal of offering 24 hours of HDTV programming by mid-2002.[27] The DISH Network currently has three existing HDTV offerings: HBO, Showtime, and a pay-per-view channel. Echostar and CBS have announced an agreement that will allow the satellite company to offer CBS high definition programming to DISH subscribers in a limited number of markets (currently New York and Los Angeles).[28] Satellite TV customers need added equipment (a slightly bigger satellite dish and either a set-top box or built-in satellite HDTV reception capability) in order to receive high-definition programming on their digital televisions.

Cable. With some exceptions, most cable franchises do not currently offer high-definition (digital) programming to subscribers.[29] Cable companies have been reluctant to carry channels of digital programming (thereby displacing some existing channel offerings) until more consumers have the digital television equipment

---

[23]Testimony of Ben Tucker, Chairman of NAB Television Board, in: U.S. Congress, House, "Digital Television: A Private Sector Perspective on the Transition," Hearing Before the Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, March 15, 2001, 107th Cong., 1st Sess., p. 72.

[24]Presentation of Mass Media Bureau at January 17, 2002 FCC Open Commission Meeting.

[25]See: [http://www.fcc.gov/mb/video/files/dtvsum.html]

[26]In October 2001, Echostar and Hughes signed a merger agreement. The merger is under review by the FCC, the Department of Justice, and Congress. For more information, see CRS Report RL31226, *Satellite Television: The Proposed Merger of EchoStar and DirecTV*, by Marcia S. Smith.

[27]*Communications Daily*, Sept. 7, 2001, p. 10.

[28]"EchoStar puts CBS into HDTV Orbit," *Electronic Media*, Jul 16, 2001.

[29]Many cable (and both DBS commercial services) are "digital." However, "digital cable"generally refers to technology which converts analog programming to a digital signal which is transmitted to the consumer and then converted back to analog form for television viewing. "Digital cable" allows cable companies to provide more channels, as well as high speed (broadband) Internet service. However, the "digital" signals transmitted over cable systems use different digital standards than the DTV standard used by broadcasters and current DTV sets; therefore current digital cable services currently cannot be directly received by DTV sets.

necessary to view digital programming (see discussion of "must carry" below). Also there are copyright, standards, and interoperability issues between the cable system and DTV sets that must be resolved (see "copyright and standards" below).

The reluctance of cable companies to carry digital programming is beginning to change, however, as cable providers in several markets have announced plans to carry digital or high-definition channels. On May 1, 2002, the nation's top ten cable companies pledged to implement FCC Chairman Powell's voluntary plan, which calls on cable operators to carry digital signals of up to five broadcast or other digital programming services by January 1, 2003.[30]

Consumer Purchase of DTV Products. DTV products are now available from several manufacturers that offer varying features and technical characteristics. Currently, most consumers who purchase DTV products are purchasing digital television monitors, available at prices ranging from about $1000 to $3500, depending on screen size and other features. Digital monitors are primarily being used by consumers to watch DVDs,[31] regular analog television, and digital programming over a satellite television system. A digital monitor must be coupled with a set-top digital receiver or tuner (costing $500 to $600) in order to receive digital broadcast signals.[32] An integrated DTV, which contains a built-in digital tuner, is sold at prices ranging from $3000 to $12,000.[33] Over the past two years, prices for DTV monitors and receivers have dropped by 50%. As the market for DTVs expands, prices are expected to decrease further.[34]

According to the Consumer Electronics Association (CEA), DTV sales (from suppliers to retail outlets) totaled 1.46 million units in 2001, about a 125% increase over the amount sold in 2000. The 2001 sales bring the total number of DTV products sold since 1998 to 2.5 million. Of this number, 362,000 integrated sets and set-top decoders (digital tuners) have been sold. CEA estimates that 16% of DTV monitors and sets sold since introduction are capable of receiving, decoding, and

---

[30]McConnell, Bill, "Cable Takes the High-Def High Road," *Broadcasting & Cable*, May 6, 2002, pp. 54-60.

[31]Commercially available DVD technology does not yet support digital programming. However, current DVDs viewed over a DTV provide a significantly higher quality picture than DVDs viewed over regular analog televisions.

[32]Many consumers are asking whether their current analog TV sets will become obsolete with the advent of DTV. Consumers can continue to use analog TV sets until the broadcasters return the analog TV licenses to the FCC, after which, a set-top digital converter box could be used to enable the analog TV set to receive the DTV signal. Digital converters, however, will only enable the display of pictures comparable in quality to existing sets. They will not provide HDTV-quality images, or other new services that may come with DTV.

[33]"Super-size Your Set," *Consumer Reports*, March 2001, p. 16.

[34]Testimony of David Arlin, Thomson Multimedia Inc. on behalf of the Consumer Electronics Association, in: U.S. Congress, House, "Digital Television: A Private Sector Perspective on the Transition," Hearing Before the Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, March 15, 2001, 107th Cong., 1st Sess., p. 47.

displaying a digital signal either on their own or partnered with a set-top box. While growth has occurred, the penetration of DTVs into the American home remains small, with between 2 and 3% of the 110 million American households having DTVs (mostly monitors), and less than 1% having the ability to receive digital signals. The CEA predicts continuing expansion of DTV sales, with projections of over 30 million DTVs sold to retailers between 2001 and 2006.[35]

Policy Issues

While the nation's transition to digital television is proceeding, industry analysts believe that widespread adoption of DTVs by consumers will not be achieved by 2006, and that television stations will continue to broadcast both analog and digital signals past the 2006 deadline. The key issue for Congress and the FCC is: what steps, if any, should be taken by government to further facilitate a timely, efficient, and equitable transition to digital television? To address this question, Congress and the FCC must confront a highly complex policy landscape, involving different industries, technologies, and interests, including: content providers, commercial and noncommercial television broadcasters, cable and satellite television providers, consumer electronics manufacturers and retailers, and consumers.

Currently the three critical components of the digital transition – programming and content, delivery of a digital signal, and consumer purchase of DTVs – appear to be lagging and hindered by what many describe as a "chicken or egg" dynamic. Most consumers are reluctant to buy DTVs until there is more high quality digital programming to watch. Content providers have a diminished incentive to create digital programming until a larger number of consumers are capable of receiving digital television service. And television service providers (especially cable and satellite) have little incentive to provide digital programming until more consumers have DTVs and content providers supply more digital programming.

Broadcasters are currently under a statutory mandate to convert, with the expectation that the presence of digital broadcast signals will provide sufficient market incentives for other stakeholders to go digital. Much of the policy debate revolves around the question of whether this strategy will yield a timely, efficient, and equitable digital transition. If not, should conversion deadlines be extended, or should additional government mandates – such as digital "must carry" or digital tuners – be placed on other stakeholders in order to accelerate the pace of the transition? Conversely, would further government intervention in the digital transition produce undesirable market distortions? The following discusses a number of specific policy issues related to the transition to digital television.

Digital "Must Carry" Debate. Responding to the debate between the broadcast and cable industries over whether cable TV providers should be required to transmit DTV programming, in July 1998 the FCC initiated a proceeding on the

---

[35]Consumer Electronics Association, Press Release, "CEA Releases Final 2001 DTV Sales Figures," January 17, 2002, available at:
[http://ce.org/market_overview/market_overview_newsroom.asp?area=21]

matter.[36] Under the "must carry" provisions of the Cable Television Consumer Protection and Competition Act of 1992, cable TV providers are required to transmit local analog programs to their customers. This decision was based on the reasoning that since cable TV has a predominant position in the market, "without mandatory carriage provisions, the economic viability of local broadcast television and its ability to produce quality local programming would be jeopardized."[37]

The broadcasters (primarily the smaller networks and independent stations, represented by the Association of Local Television Stations, but also the National Association of Broadcasters) believe that the same principles and conclusions of the 1992 Act should apply to DTV services, leading to mandatory carriage of the DTV programming by cable operators. Broadcasters argue that because most Americans (about 65%) receive their TV via cable, the carriage of DTV programming by cable providers is essential for consumers to purchase DTV receivers.

The cable companies (led by the National Cable Television Association, NCTA) oppose any "must carry" requirements for cable operator carriage of DTV programming, arguing that it would be an unlawful taking of their property, and that they should be able to decide what content they provide on their own networks. NCTA points out that, unlike the broadcasters who were given free spectrum licenses for DTV, cable operators must build their own infrastructure to be able to transmit DTV signals. Cable operators say they will carry broadcasters' DTV programming as soon as consumer demand warrants it. Cable television services provide a finite number of channels to consumers, and any mandate to provide DTV programming would require cable companies to remove other non-broadcast channels. Many cable operators are investing in the upgrades needed to provide DTV, although the video transmission standards adopted by cable operators may not be the same as those used by the broadcasters. This could mean that different home equipment may be necessary for cable services than for over-the-air TV reception. In addition, HDTV programming will require cable operators to build a more robust transmission (i.e., greater bandwidth) capability than is required by SDTV, and some cable operators may want to offer SDTV but not HDTV services. The cable industry also contends that mandating carriage of all DTV broadcast transmissions will financially devastate many smaller cable operators.

On January 22, 2001, the FCC announced its adoption of rules for cable carriage of digital TV signals. Most notably, the FCC ruling does **not** require cable systems to simultaneously carry both the analog and digital signals ("dual carriage") of local TV stations. The FCC tentatively concluded that "such a requirement appears to burden cable operators' First Amendment interests more than is necessary to further

---

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

[37] *Ibid*., p. 5. Satellite television is also subject to must carry requirements. See CRS Report RS20425, *Satellite Television: Provisions of the Satellite Home Viewer Improvement Act and the Launching Our Communities Access to Local Television Act, and Continuing Issues*, by Marcia S. Smith.

a substantial governmental interest."[38] A Further Notice of Proposed Rulemaking (FNPRM) will continue to collect public comment and investigate this issue.[39]

While not approving a dual carriage mandate, the FCC did rule that a digital-only TV station, whether commercial or non-commercial, can immediately assert its right to carriage on a local cable system. Additionally, a TV station that returns its analog spectrum and converts to digital operations must be carried by local cable systems. Cable systems must carry "primary video," defined as a "single programming stream and other program-related content." The FNPRM will define the scope of "program-related content."

Mandating Digital Tuners. Currently, less than one percent of American households have purchased DTVs equipped or accompanied with digital tuners that can receive digital broadcast signals. Some groups (for example, broadcasters) advocate a government mandate that would require new televisions to contain built-in digital tuners.

A study conducted by Arthur D. Little (and commissioned by the National Association of Broadcasters and the Association of Maximum Service Television) estimates that DTV set penetration would reach 75.5% by 2006, if the FCC were to mandate that all new sets sold after January 1, 2004 have DTV reception capability. Supporters of a mandate argue that requiring digital tuners would ensure a quicker penetration of DTVs into American households, thereby giving digital content providers and distributors greater incentive to produce and transmit digital content.

Consumer electronics manufacturers and many consumer advocates oppose a digital tuner mandate, arguing that it would raise prices of television sets beyond the means of many consumers.[40] Opponents also dispute whether a digital tuner mandate would effectively hasten the DTV transition, since 70% of households currently receive their television via cable or satellite and therefore don't require an over-the-air digital reception capability. Finally, they argue that a digital tuner mandate would constitute an inappropriate, unnecessary, and counterproductive government intervention into an increasingly dynamic digital television marketplace.

Copyright Protection Technology. Many content providers (e.g. movie studios and broadcast networks) are reluctant to provide high quality digital content to DTV owners until they are assured that interoperability standards and technology licensing agreements are in place to prevent consumers from making unauthorized copies and Internet transmissions of digital content. In 1998, five consumer electronics manufacturing companies – Hitachi, Intel, Matsushita, Sony, and Toshiba – formed an entity called the Digital Transmission Licensing Administrator (DTLA, also known as "5C") to license a jointly developed Digital Transmission Content

---

[38]See: [http://www.fcc.gov/Bureaus/Cable/News_Releases/2001/nrcb0103.html]

[39]*Federal Register*, March 26, 2001 (Volume 66, Number 58), pp. 16523-16532.

[40]Estimated at an initial cost of $200 per set (see: April 6, 2001 Comments of the CEA to the FCC, MM Docket No. 00-39). This figure is disputed by broadcasters (see: May 7, 2001 Comments of NAB/MSTV/ALTV to the FCC, MM Docket No. 00-39).

Protection (DTCP) technology. DTCP is designed to protect audiovisual and audio content against unauthorized interception or retransmission in the digital home environment.

On July 17, 2001, two major studios – Warner Bros. and Sony Pictures Entertainment – announced a licensing agreement to adopt DTCP. The agreement is designed to permit the studios to protect prerecorded media, pay-per-view, and video-on-demand transmissions against unauthorized copying, and to protect all content against unauthorized Internet retransmission, while assuring consumers' ability to continue customary home recording of broadcast and subscription programming.[41]

While DTCP protects content delivered to the home via cable or satellite, the technology does not protect over-the-air broadcast content. Other major studios have been reluctant to sign licensing agreements with DTLA until broadcast content can also be protected. Additionally, broadcast networks (ABC, CBS, and Fox) have opposed the 5C standard, arguing that the technology's inability to encrypt over-the -air broadcasts will cause high quality content to migrate toward cable and satellite exclusively. A week after the 5C agreement with Sony Pictures and Warner Bros. was announced, the five other major studios (Disney, Paramount, Fox, Universal, and MGM) submitted a proposal to DTLA which would require digital broadcast content to be encrypted with a "broadcast flag" preventing Internet distribution or retransmission of digital content broadcast over-the-air. On June 3, 2002, a group of engineers from the motion picture and technology industries[42] released a detailed "broadcast flag" proposal. While the proposal is strongly supported by the content industry, the technology industry remains divided, with some companies supporting and others opposing this particular proposal. Some consumer groups have also expressed opposition. At the behest of House Committee on Energy & Commerce Chairman Tauzin, continuing negotiations between the interested parties are expected.

Another copyright protection issue of concern to content providers is what's commonly referred to as the "analog hole." In the foreseeable future, many consumers will continue to use analog televisions. In order to display the content carried by digital signals, analog televisions will be equipped with a digital tuner (a set-top box) which converts the signal from digital to analog. At this point, the digital signal, even if content protected, is converted into an unprotected analog form which could then be easily converted into a similarly unprotected digital form subject to the unauthorized copying and Internet transmission the content providers are seeking to prevent. Accepted copyright protection technologies to "plug" the "analog hole" have not yet been developed, and will likely require further technology development and negotiation involving the content providers and consumer electronics manufacturers.

---

[41]DTLA Press Release, "DTLA, Sony Pictures Entertainment and Warner Bros. Announce First Studio Licenses for Digital Home Network Technology," July 17, 2001, see: [http://www.dtcp.com/data/press/DTCP_PRESS_010717.pdf]

[42]The Broadcast Protection Discussion Group (BPDG), a subgroup of the Copy Protection Technical Working Group (CPTWG).

On February 28, 2002, the Senate Commerce, Science, and Transportation Committee held a hearing examining the issue of digital content copyright protection and its effect on the digital television transition and broadband deployment. The hearing focused on draft legislation – the Security Systems Standards and Certification Act (SSSCA) – which would set a deadline for the private sector to agree on copyright protection standards. If the deadline is not met, the draft legislation would mandate copyright protection features within digital consumer electronic devices (such as personal computers). The embedded copyright protection technology would prevent the unauthorized downloading of audio, video, or other files. The draft legislation is strongly supported by movie studios and broadcasting networks. It is strongly opposed by the consumer electronics industry and many in the information technology (IT) community. The draft legislation was subsequently introduced on March 21, 2002 by Senator Hollings as the Consumer Broadband and Digital Television Promotion Act (S. 2048).

Cable/DTV Interoperability Standards. Interoperability standards between digital televisions and cable systems are necessary in order for consumers to be able to watch digital programming over their cable systems. Two separate entities – the consumer electronics industry and the cable system operators – have embarked on an often contentious process of determining the specific technical details of how DTV devices will achieve compatibility and interoperability with cable systems. A key issue is the extent to which embedded copyright protection technologies and navigation features will reside within proprietary cable equipment, as opposed to within consumer-purchased devices.

On February 22, 2000, the Consumer Electronics Association (CEA) and the National Cable Television Association (NCTA) announced a voluntary agreement on a set of technical requirements that permit the direct connection of digital television receivers to cable television systems. However, consumer electronics manufacturers and retailers have sharply disagreed with the cable industry over the pace and details of the agreement's implementation. On September 14, 2000, the FCC adopted a Report and Order (FCC 00-342) establishing labeling definitions for cable-ready DTV receivers, while also calling on the consumer electronics and cable industry to finalize interoperability standards. The FCC directed the CEA and the NCTA to file reports by November 30, 2000, and every six months thereafter until October 2002, on the progress achieved toward implementing the February 2000 agreement. The reports reveal starkly differing perspectives on the status of DTV/cable interoperability.

While citing "nominal progress" on the standards needed to ensure DTV/cable compatibility, the CEA asserts that "at present, CEA members remain unable to design or build any product with minimum competitive functionality for direct operation on a cable system."[43] According to the CEA, the cable industry has failed to provide technical specifications that would support a commercial market for navigation devices (i.e. set top boxes) that would be competitive with cable

---

[43]Consumer Electronics Association, Written *Ex Parte* Presentation: PP Docket No. 00-67, "Compatibility Between Cable Systems and Consumer Electronics Equipment," November 6, 2001.

companies' proprietary set-top boxes. On the other hand, the cable industry asserts that it has complied with the FCC requirements on cable-DTV compatibility. According to the NCTA, "there are no technical barriers to a manufacturer building an integrated DTV model with the features described in the CEA/NCTA technical agreement," and that "cable operators have taken various measures to facilitate the retail availability of set-top boxes."[44]

The resolution of interoperability, as well as copyright standards issues, is currently being negotiated by industry and encouraged by the FCC. Given that many observers see the resolution of these issues as crucial to a timely and successful DTV transition, it is possible that Congress may intervene at some point in the future, if the many competing industries and interests cannot reach an agreement in a timely manner.

Digital Conversion of Public Broadcasting Stations. The FCC has set a deadline of May 1, 2003 for public television stations to convert to digital. Public television consists of 177 licensees operating 354 stations nationwide. According to the Public Broadcasting Service (PBS), as of May 2002, 75 PBS member stations were offering digital broadcast services, covering approximately 55% of all U.S. households.[45] PBS estimates that about one third of public television stations are at risk of not meeting the deadline,[46] and would thus likely seek extensions from the FCC.

Raising money for the digital conversion is a challenge for many public television stations, especially those in small markets. According to the Association of America's Public Television Stations (APTS), the total nationwide cost of conversion is $1.7 billion. State governments and local communities have provided most of the funding to date, about $748 million.[47] Public broadcasters are seeking a substantial federal contribution ($699 million over five years) for digital conversion. This funding would be used to pay for the new equipment and physical infrastructure required for digital conversion (e.g. transmitters, translators, and production equipment). Public stations are seeking this funding from the Public Telecommunications Facilities Program (PTFP), a grant program administered by the National Telecommunications and Information Administration (NTIA) at the Department of Commerce.

The PTFP, which has provided matching grants for public broadcasting equipment for over 35 years, has already begun funding digital conversion, awarding $15.7 million for 44 television projects in FY1999 and $18 million for digital television transition for 31 projects in FY2000. The FY2001 grants were announced on October 1, 2001. The PTFP awarded $35 million for 52 digital conversion

---

[44]National Cable Television Association, "Compatibility Between Cable Systems and Consumer Electronics Equipment," PP Docket No. 00-67, October 31, 2001.

[45]For the latest count, see: [http://www.pbs.org/digitaltv/dtvtech/map.htm]

[46]Rutenberg, Jim, "A Digital Divide Threatens Public TV," *New York Times*, April 15, 2001.

[47]Association of Public Television Stations, *Issue: Digital Television Conversion Funds*, at http://www.apts.org/

projects. Funding for digital conversion represents 83% of the total FY2001 PTFP grant awards (which includes funding other equipment needs not related to digital conversion).

For FY2002, the Administration requested $43.46 million for PTFP (approximately the same as appropriated for FY2001). The FY2002 Commerce-State-Judiciary Appropriations (CJS) Act (P.L. 107-77/H.R. 2500/S. 1216) matches the Administration's request of $43.46 million.[48] On November 20, 2001, NTIA published in the Federal Register a notice soliciting applications for FY2002 funding.[49] For FY2002, NTIA plans to award $25 million for new grants, and $16 million to fund additional phases of multi-year projects initially funded in FY2000 and FY2001. While the exact amount of PTFP funding for digital conversion in FY2002 cannot be determined until NTIA makes its award decisions, it is likely that a large portion of the total PTFP FY2002 appropriation will be channeled toward digital conversion needs. For FY2003, the Administration is requesting $43.58 million for PTFP, virtually the same level appropriated by the FY2002 CJS Act.

Whereas PTFP grants go for equipment, federal funds from the Corporation for Public Broadcasting (CPB) are supporting the development and distribution of digital content. For FY2001, the Labor-HHS-Education Appropriation Act (P.L. 106-554) appropriated $20 million to CPB for investment in DTV programming and distribution, but required congressional authorization before it could be released. The FY2001 Supplemental Appropriations Act (H.R. 2216, P.L. 107-20, signed July 24, 2001) contained language authorizing release of those funds to CPB. For FY2002, the Administration requested an additional $20 million for CPB for the purposes of digital conversion. Both House and Senate versions of the FY2002 Labor-HHS-Education appropriation bills (H.R. 3061, H.Rept. 107-229/S. 1536, S.Rept. 107-84) sought to provide $25 million to CPB for digital conversion. The House bill would provide the funding pending authorization legislation. The Labor-HHS conference report (H.Rept. 107-342) provides $25 million for equipment and facilities to enable public broadcasters to meet the statutory deadline for digital conversion as proposed by the Senate. The conference agreement does not provide these funds contingent upon authorization as proposed by the House. The bill was signed into law (P.L. 107-116) on January 10, 2002.

Meanwhile, H.R. 4641 (Wireless Technology Investment and Digital Dividends Act of 2002), introduced on May 2, 2002 by Rep. Markey, would provide increased funding through the PTFP to assist digital conversion of public television stations.

Reclaiming the Analog TV Spectrum. The goal of the FCC and Congress has always been to complete the transition to DTV as quickly as possible, so that NTSC (analog) spectrum can be reclaimed and reallocated for other purposes. Some of the NTSC spectrum will be auctioned for commercial wireless services, and some

---

[48]For FY2002, PTFP received an additional $8.25 million through the Emergency Supplemental, P.L. 107-117 (bringing the total FY2002 PTFP appropriation to $51.7 million).

[49]See: [http://www.ntia.doc.gov/ptfp/pdfForms/pffp_noa_2002.pdf]

of it will be used for new public safety services (the FCC has already designated some of the analog TV spectrum for public safety use).

The current target date for broadcasters to return analog spectrum is December 31, 2006. However, the Balanced Budget Act of 1997 allows a station to delay the return of the analog spectrum if 15% of the television households in its market do not subscribe to a multi-channel digital service and do not have digital television sets or converters. Given the slower-than-expected pace that digital televisions have been introduced into American homes, few observers believe that the goal of digital televisions in 85% of American homes by 2006 will be reached.[50] Thus, some observers are concerned that if digital television does not sufficiently penetrate American homes in the near future, the analog spectrum will not be reclaimed, and broadcasters will keep both analog and digital television spectrum licenses indefinitely, thereby preventing spectrum from being available for commercial wireless services and public safety applications (for example, police and firefighter radio communications).

One issue is the channel 60-69 spectrum, also referred to as the upper 700 MHz band. The Budget Act of 1997 directed the FCC to reclaim channels 60-69 starting in 2001 (the auction has subsequently been postponed to January 14, 2003). This constitutes a total of 60 MHz of spectrum, consisting of 24 MHz for public safety services and 36 MHz for commercial wireless services. However, many incumbent television broadcasters are currently using the spectrum, and will continue using it until at least December 31, 2006. License winners may not cause interference to incumbent broadcasters, making it very difficult to use the spectrum for some time in the more populated parts of the country. In an effort to encourage band-clearing, the FCC is providing flexibility to broadcasters to facilitate the development of voluntary band-clearing arrangements between incumbent broadcasters and new commercial wireless interests. In particular, a broadcaster that gives up one of its channels to accommodate band-clearing will be allowed to continue to operate its analog channel and convert to DTV through December 31, 2005, with the option of a deadline extension if less than 70% of the television households in its market are capable of receiving DTV signals.[51]

Meanwhile, the FCC has adopted allocation and service rules for 48 MHz of spectrum in the 698-746 MHz band (lower 700 MHz band) currently occupied by television channels 52-59. The order reallocates the spectrum to fixed and mobile services while retaining the existing broadcast allocation for both new broadcast services and incumbent broadcast services during their transition to DTV. The FCC will establish technical criteria designed to protect incumbent television operations during the DTV transition period, and allow Low Power Television (LPTV) and TV

---

[50]Historically , consumer electronics products take many years to be adopted. Since its introduction in 1953, color television took roughly 25 years to enter 85% of American homes. The video cassette recorder (VCR) took 15 years to reach 85% of homes.

[51]For more information, see FCC Press Release, "FCC Provides Certain Additional Flexibility to Facilitate Voluntary Clearing of Incumbent Broadcasters in the Upper 700 MHz Band," Sept. 17, 2001. See:
[http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-216145A1.pdf]

translator stations to retain secondary status and to operate in the band after the transition.[52] The lower 700 MHz band auction is scheduled for June 19, 2002.

Previously, both the upper and lower 700 MHz band auctions were scheduled for June 19, 2002. During the spring of 2002, with the June 19 auction date approaching, many in the wireless industry, along with the Department of Commerce, called on the FCC to postpone indefinitely the impending auctions. Proponents of postponement cite the lack of a comprehensive spectrum policy and the difficulty faced by commercial wireless companies in forming a business plan to use spectrum which may remain encumbered by analog broadcasters for an uncertain period of time. Opponents of postponement (e.g. those who want the June 19 auction to go forward) include some smaller telecommunications companies who seek to license and use frequencies in rural areas, and incumbent broadcasters who wish to pursue financial arrangements with commercial wireless companies for voluntarily vacating the 700 MHz band before the 2006 statutory deadline.

The Auction Reform Act of 2002 – H.R. 4560 (Tauzin)/S.2454(Ensign) – would indefinitely postpone the scheduled June 19, 2002 auctions of the upper and lower 700 MHz band. H.R. 4560 (H.Rept. 107-443) passed the House on May 7, 2002. Opposing legislation was introduced into the Senate by Senator Stevens. S. 2481, the Auction Timing Completion Act, would require auction of 700 MHz spectrum in compliance with existing statutory deadlines and would give the FCC discretion to set the auction date for all other spectrum auctions in the future. On May 24, 2002, the FCC announced its decision to delay the upper 700 MHz band auction (channels 60-69) until January 14, 2003. The lower 700 MHz band auction (channels 52-59) will proceed as scheduled on June 19, 2002.

Meanwhile, some have urged Congress to require broadcasters to return the analog spectrum on "a date certain." Under this approach, spectrum would be freed up for other uses. Legislation in the 107th Congress (H.R. 3397, the Homeland Emergency Operations Response Act introduced by Rep. Harmon on December 4, 2001) would prohibit any delay in reassigning the 24 MHz for public safety purposes, and require those frequencies to be operational by January 1, 2007. The Wireless Technology Investment and Digital Dividends Act of 2002 (H.R. 4641), introduced by Rep. Markey on May 2, 2002, requires the FCC to ensure that any rules necessary to effectuate the timely transition to digital television are promulgated and completed prior to making available 700 MHz bands to commercial wireless services.

The Bush Administration, in its FY2003 budget request, proposed an analog spectrum lease fees as an incentive for broadcasters to surrender their analog spectrum. Under this proposal, the FCC would establish an annual lease fee of $500 million which commercial broadcasters would begin paying in 2007. While similar fees were proposed by the previous two Administrations, Congress has neither implemented nor endorsed this approach.

---

[52] *FCC Report and Order in the Matter of Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59)*, GN Docket No. 01-74, FCC 01-364, released January 18, 2002.

Low Power TV. Low Power Television (LPTV) was created by the FCC in 1982 to serve rural areas and individual communities within larger urban areas. LPTV stations may not exceed 3 kilowatts for VHF channels or 150 kilowatts for UHF channels, and must not cause interference in the reception of full service television stations. Currently, there are 2184 LPTV stations in the United States. Concerns have arisen that many LPTV stations will lose their licenses in the transition to DTV. While the FCC's February 1998 modification to its table of allotments for DTV licensees did provide for some LPTV licensees to be relocated to new frequencies, many would still lose their licenses under FCC digital transition plans. To provide some relief for LPTV licensees, the Community Broadcasters Protection Act of 1999 was enacted as part of the Intellectual Property and Communications Omnibus Reform Act of 1999 (P.L. 106-113). This law established a "class A" status to qualifying LPTV licensees, giving them a measure of protection from full-power TV stations in the transition to DTV. The Act directs that Class A licensees be accorded primary status as television broadcasters, prescribes the criteria LPTV stations must meet to be eligible for Class A status, and outlines the interference protection Class A stations must provide to other television stations. To implement the Act, in April 2000, the FCC established rules for Class A LPTV licensees, to facilitate the acquisition of capital for LPTV stations to continue to provide free, over-the-air programming to their communities.[53]

In accordance with the 1992 Cable Act (47 USC 534), cable television providers are required to transmit to their audiences the locally-generated programming of all full-power TV broadcasters that request carriage, a provision known as "must-carry" (discussed earlier). Under the 1992 Act, some LPTV stations are entitled to "must-carry"status if they meet certain criteria.[54] The FCC's April 2000 ruling did not address the question of whether Class A licensees should be entitled to the "must-carry" provision, as are full-power broadcast TV stations. A petition filed with the FCC argued that Class A licenses should be granted the same "must-carry" status as full-power broadcasters. The FCC subsequently ruled that Class A stations do not have the same must carry rights as full service television stations.[55]

Fees for Ancillary or Supplemental Services. The Telecommunications Act (P.L. 104-104) states that if a DTV licensee offers ancillary or supplemental services for which they receive a subscription fee or other compensation, the FCC "shall establish a program to assess and collect from the licensee...an annual fee or other schedule or method of payment ..." The Act further states that the collection of fees "shall be designed (i) to recover for the public a portion of the value of the public spectrum resource made available for such commercial use, and (ii) to avoid

---

[53]*FCC Report and Order in the Matter of Establishment of Class A Television Service*, MM Docket No. 00-10, FCC 00-115, released April 4, 2000.

[54]Those criteria (47 USC 534) include (among other requirements) that the community of license of the LPTV station has a population not exceeding 35,000, that there is no full-power TV station licensed to any community within the county or other political subdivision (of a state) served by the cable system, and that the LPTV station provides the only news coverage in its community of license.

[55]*FCC Memorandum Opinion and Order on Reconsideration in the Matter of Establishment of Class A Television Service,* MM Docket No. 00-10, FCC 01-123, released April 13, 2001.

unjust enrichment through the method employed to permit such uses of that resource."[56] Congress is overseeing the FCC's actions regarding implementation of this law. Public interest groups have also maintained pressure on the FCC to establish a fee program, arguing that broadcasters should compensate the American people for the use of the DTV spectrum, and that fees should be required out of fairness to those who paid for spectrum at FCC auctions (such as licensees for personal communications services).

In November 1998, the FCC adopted rules to require broadcasters to pay 5% of their gross revenues from ancillary or supplementary uses of DTV spectrum for which they charge subscription fees or other specified compensation.[57] These include subscription video, software distribution, data transmissions, teletext, interactive materials, aural messages, paging services, and audio signals. Home shopping channels and "infomercials" are not subject to fees because the FCC did not consider them new services. The FCC has initiated a separate proceeding to determine how much non-commercial stations can use the DTV spectrum for revenue-generating services, and whether they should have to pay spectrum fees. Some consumer groups say that the FCC's spectrum fees are not heavy enough on commercial broadcasters, arguing that most revenue will come from home shopping and infomercials. They also warn that public broadcasters should not be over-regulated, arguing that too heavy a burden placed on public broadcasters could impair their long-term viability.

On October 11, 2002, the FCC ruled that noncommercial stations are required to use their entire digital capacity primarily for nonprofit, noncommercial, educational broadcast services. However, the FCC also ruled that the statutory prohibition against advertising on noncommercial broadcasts does not apply to any ancillary or supplementary services presented on an excess DTV channels that does not constitute broadcasting. The FCC further ruled that public stations must pay a fee of five percent of gross revenues generated by ancillary or supplementary services provided on their DTV service.[58]

Public Interest Obligations of DTV Broadcasters. In March 1997, President Clinton established an Advisory Committee on Public Interest Obligations of DTV Broadcasters, to make recommendations on how DTV licensees should compensate the public for their licenses. Committee members were selected from government, the broadcasting industry, academia, and consumer interest organizations. After a series of public meetings in 1997 and 1998, the Committee submitted a set of recommendations to Vice President Gore in December 1998. The recommendations consist of mostly voluntary actions by broadcasters, including

---

[56]The Budget Resolution of 1997 (H.Con.Res.84) included a provision requiring broadcasters to pay a spectrum usage fee of $2 billion over five years. Broadcasters strongly opposed that provision, however, and it was not included in the Budget Act of 1997.

[57]*FCC Report and Order on Fees for Ancillary or Supplementary Use of Digital Television Spectrum,* MM Docket No. 97-247, released November 19, 1998.

[58]*FCC Report and Order in the Matter of Ancillary or Supplementary Use of Digital Television Capacity by Noncommercial Licensees*, MM Docket no. 98-203, FCC 01-306, released October 17, 2001.

providing five minutes per night of air time for candidate-centered discourse in the 30 days prior to an election. Some panel members wanted to recommend mandating the free air time as well as other Committee proposals. The White House referred the report to the FCC, which on December 15, 1999, opened a Notice of Inquiry (NOI) proceeding to solicit public comment on public interest obligations of TV broadcasters as they transition to DTV. After reviewing public comment, the FCC, on September 14, 2000, issued a Notice of Proposed Rulemaking (NPRM) which seeks to require television broadcasters (both digital and analog) to disclose on a quarterly standardized form how they are serving the public interest.

Tower Siting. One obstacle to the broadcasters' ability to offer DTV services is the opposition from state and local communities over the building of new signal transmission towers.[59] In most cases, DTV antennas can be built on top of existing towers used for analog TV broadcasting. If new towers are required, however, they must be constructed before the stations can transmit DTV signals. In August 1997, the FCC released an NPRM (FCC 97-182) to consider the preemption of state and local zoning restrictions on the siting, placement, and construction of DTV broadcasting facilities. In its January 18, 2001 Report and Order, the FCC concluded that "while some stations are facing problems with tower availability and/or local zoning issues, such problems do not seem to be widespread at this time."[60] The FCC will continue to monitor the situation and intends to work with the involved parties as problems arise.

Activities in the 107th Congress

Congressional committees are keenly monitoring the pace and progress of the digital transition. On March 1, 2001, the Senate Committee on Commerce, Science, and Transportation held a hearing on the transition to digital television.[61] The House Energy and Commerce Committee, Subcommittee on Telecommunications and the Internet, held a hearing on March 15, 2001 entitled, "Digital Television: A Private Sector Perspective on the Transition."[62] Further hearings are expected in 2002, and a number of bills have been introduced into the 107th Congress relating in some way to digital television (see Appendix).

On April 4, 2002, FCC Chairman Michael Powell submitted, to the Chairmen of the House Energy and Commerce Committee and the Senate Commerce, Science, and Transportation, a proposal for voluntary industry actions to speed the digital television transition. The proposal, which is purely voluntary, is intended (in Commissioner Powell's words) "to provide an immediate spur to the transition by giving consumers a reason to invest in digital technology *today*, while we continue

---

[59]For more information on DTV tower siting, see: [http://www.fcc.gov/mmb/prd/dtv/

[60]*FCC Report and Order and Further Notice of Proposed Rulemaking In the Matter of Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, MM Docket No. 00-39, FCC 01-24, p. 37.

[61]See: [http://commerce.senate.gov/issues/telco.htm#Hearings]

[62]See: [http://energycommerce.house.gov/107/hearings/03152001Hearing108/hearing.htm]

to work on resolving the longer-term issues."[63] Specifically, the proposal calls on industry to do the following:

- *Broadcast networks* – provide high-definition or other value added DTV programming during at least 50% of their prime-time schedule, beginning with the 2002-2003 season.

- *Broadcast licensees* – affiliates of top four networks in markets 1-100 broadcast a digital signal by January 1, 2003.

- *Cable* – systems with 750 MHz or higher carry digital signals of up to five broadcast or other digital programming services by January 1, 2003.

- *Direct Broadcast Satellite* – carry signals of up to five digital programming services by January 1, 2003.

- *Equipment Manufacturers and Retailers* – include over-the-air broadcast tuners in new broadcast television receivers according to a specified timetable.

If industry can voluntarily meet some or all of the above goals, the pressure for Congressional action in the face of looming deadlines may lesson. However, if industry cannot take the voluntary steps necessary to accelerate the digital transition, Congress and the FCC may take action to ensure a smoother and more timely nationwide adoption of digital television. Public policy goals include: providing all consumers with the benefits of a superior and versatile technology, ensuring a dynamic and competitive marketplace, and increasing the availability of radiofrequency spectrum for other uses. Options for congressional action include: mandating digital tuners, mandating dual carriage of digital and analog programming, accelerating the vacating of analog television spectrum, legislating a process whereby interoperability standards and copyright protection technologies will be implemented, and extending, strengthening, and/or altering the transition deadlines. Congressional intervention regarding any of the above options is highly controversial and would face significant opposition from one or more DTV stakeholders.

---

[63]For proposal and cover letters to Committees, see:
[http://www.fcc.gov/commissioners/powell/mkp_proposal_to_speed_dtv_transition.pdf]

Appendix – Legislation in the 107th Congress Related to Digital Television

H.R. 3397 (Harmon)

Homeland Emergency Operations Response Act. Prohibits any delay in reassigning 24 MHz in the upper 700 MHz band (currently occupied by television broadcasters) for public safety purposes, and requires those frequencies to be operational by January 1, 2007. Introduced December 4, 2001; referred to Committee on Energy & Commerce.

H.R. 3448 (Tauzin)

Public Health Security and Bioterrorism Response Act of 2001. Section 531 requires the FCC to allot a digital channel to any requesting full-power television station that had an application pending for an analog television station construction permit as of October 24, 1991, and which had its application granted after April 3, 1997. Passed by House December 12, 2001; passed by Senate December 20, 2001. Conference report (H.Rept. 107-481) approved by House and Senate on May 22 and May 23, respectively. Cleared for White House.

H.R. 4560 (Tauzin)

Auction Reform Act of 2002. Repeals statutory deadlines for spectrum auctions of the 700 MHz band currently occupied by television broadcasters. Directs FCC to indefinitely postpone scheduled June 2002 auctions of 700 MHz band. Introduced April 24, 2002; referred to Committee on Energy & Commerce. Reported by Committee (H.Rept. 107-443) May 7, 2002. Passed House on May 7, 2002.

H.R. 4641 (Markey)

Wireless Technology Investment and Digital Dividends Act of 2002. Requires FCC to ensure that any rules necessary to effectuate the timely transition to digital television are promulgated and completed prior to making available the bands of frequencies at 747-762 and 777-792 MHz for advanced commercial mobile services or other competitive wireless services. Also provides increased funding to assist digital conversion of public television stations. Introduced May 2, 2002; referred to Committee on Energy & Commerce.

S. 2048 (Hollings)

Consumer Broadband and Digital Television Promotion Act. Providing for private sector development of technological copyright protection measures to be implemented and enforced by federal regulations to protect digital content and promote broadband as well as the transition to digital television. Introduced March 21, 2002; referred to Committee on Commerce, Science, and Transportation.

S. 2448 (Hollings)

Broadband Telecommunications Act of 2002. Title IV provides grants to public broadcaster through the Department of Commerce for facility upgrades to transmit digital television and to develop educational and public interest digital programming. Introduced May 2, 2002; referred to Committee on Commerce, Science and Transportation.

S. 2454 (Ensign)

Auction Reform Act of 2002. Repeals statutory deadlines for spectrum auctions of the 700 MHz band currently occupied by television broadcasters. Directs FCC to indefinitely postpone scheduled June 2002 auctions of 700 MHz band. Introduced May 2, 2002; referred to Committee on Commerce, Science, and Transportation.

S. 2481 (Stevens)

Auction Timing Completion Act. Requires auction of 700 MHz spectrum in compliance with existing statutory deadlines and gives the FCC discretion to set the auction date for all other spectrum auctions in the future. Introduced May 8, 2002; referred to Committee on Commerce, Science, and Transportation.