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David Donnelly

The College of New Rochelle, ddonnelly@cnr.edu

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Determining the Next U.S. Television Standard

David Donnelly, Ph.D.



Dr. David Donnelly is on the faculty of the School of Communication at the University of Houston. His research and publishing interests include the diffusion of innovations and the social impact of technology, communication policy, and technological forecasting. He has also provided media and Internet consultation for numerous private and nonprofit organizations. His articles have appeared in such publications as *Telematics and Informatics*, *Communication Research*,

The Encyclopedia of Film, and *Mass Communication in the Information Age*. He received an M.A. and Ph.D. in Communication from the University of Massachusetts, Amherst, and a B.A. in RTVF from the University of Maryland, College Park.

The history of television technology is characterized by innovation and standardization. Technological refinements have been both propelled and constrained by the standardization process. The ongoing effort to replace the entrenched U.S. television system with a new, superior standard has been underway for a decade and has undergone several significant evolutions. Over the years, as the proposed replacement standard has been defined and redefined, a strategy has emerged that has moved the technology closer to the marketplace. This article provides a synopsis and analysis of recent events in the U.S. digital television standards-setting process and a set of public policy recommendations to guide the remaining proceedings.

From HDTV to DTV

The phrase “high definition” is not new. Increased picture resolution and quality has been a topic of discussion since the early days of television. The standards set in the early 1940s were considered by many contemporaries to be “high resolution.” More recently, Japanese researchers reopened the issue of image resolution in the 1980s, as their newly-developed Hi-Vision system—an analog video system which

roughly doubled the number of scanning lines of the current global systems—was promoted for worldwide adoption. Nationalistic pride and economic self-interest prompted related research across the globe, and “high definition” became an umbrella term for the various systems connected by similar technical characteristics:

- A wider aspect ratio.
- Increased scanning lines.
- An improved audio signal.

The common goal was to become the next television standard. Fueled by fear, primarily based upon dire economic scenarios, political pressure, the growing sentiment that the 21st century demanded a new standard, and a groundswell of related rhetoric, the race to design and implement a new television standard began in earnest in the mid-1980s.

As the race got underway and increasing numbers were convinced that it was indeed time to phase out the old system, much of the discussion shifted from a debate over the need for a new standard to deliberations on the nature of the new standard. Technological developments helped subsume the original acronym of HDTV, as well as the original limited conception of what the next standard would be. The debate broadened to consider a wider range of possible configurations and applications. The evolution of this discussion is illustrated by a shift in popular monikers for the next standard, as the technology under consideration seemed to move through various labels:

- High-definition television (HDTV), a specific wide-screen, high-resolution system.
- Advanced television (ATV), a more encompassing and somewhat vague umbrella term.
- Digital television (DTV), a specific, yet flexible and inherently “undefined” system which brings with it improved image quality and/or increases in quantity of programming.

As the topic of discussion evolved and the positions of key players shifted, the standards-setting process was impacted.

A Single Standard Emerges

The initial momentum of the early discussions was strong enough to set the formal standards-setting process in motion. The process has moved steadily, albeit slowly, forward over the past eight years. To simplify a highly complex process, the government has coordinated the standards-setting efforts, while private industry has helped to guide and fund them.

At the center of the government coordination is the Federal Communications Commission (FCC). The FCC has been formally active since initiating the rule-making proceedings in a *Notice of Inquiry* released in 1987. The proceedings have consisted of a series of tentative decisions and proposals detailed in an ongoing sequence of inquiries, notices, and requests for comments. The commission also established the Advisory Committee for Advanced Television Service (ACATS) to assist them, and to provide guidance and input. With membership drawn from numerous communication sectors, the Advisory Committee served as a mechanism to hammer out conflicting private interests. Under the auspices of ACATS, a single digital television standard emerged.¹ The development and testing of the standard—the Grand Alliance DTV system—has been underwritten by private industry.

The wide support for the standard is, in large part, due to the open nature of the standards-setting proceedings, and the fact that the design of the system was a broad, collaborative effort. All interested parties were welcome to participate in the proceedings, although various members of the computer and film industries have argued that their interests and presence have not been adequately represented in the latter stages of the process and in the design of the standard itself. (It should be noted that the previously-adopted 1941 NTSC and 1953 color standards also had dissenters and were not universally embraced and supported.) Nonetheless, the standard retains broad support, especially across the broadcasting industry. It was formally adopted by the ACATS in April 1995 and subsequently forwarded to the FCC for consideration and action.

The Spectrum Debate

While the FCC was considering the proposed standard, an unresolved issue connected with the implementation of the next standard sparked a heated debate. Should the broadcasters be given the spectrum for the new digital license, or should they be required to bid for it in auction?

Since the FCC had recently auctioned spectrum for other telecommunications services, the airwaves have been increasingly perceived as a valuable commodity. Hence, the spectrum to be employed in the transition to digital television became entangled in divisive budget deliberations. Former Senator Bob Dole was the most ardent opponent of what he perceived to be a free corporate handout of spectrum space to broadcasters. The issue became a sticking point in the passage of the Telecommunications Reform Act of 1996, so an agreement was reached to address the issue of spectrum auctions at a later date.

In a letter to FCC Chairman Reed Hundt sent January 31, 1996, several key members of Congress, including Speaker Newt Gingrich, concurred with Dole's concerns and expressed their intent to hold open hearings on spectrum issues and to move related legislation overhauling spectrum management policies. After a media blitz from broadcasters concerning the dire impact up-front auctions would have on them—and allegedly on the future of free TV—the debate quieted down.

On June 19, 1996, Newt Gingrich and several of his colleagues sent another letter to Chairman Hundt indicating their desire to *give* spectrum to broadcasters for digital television. The spectrum would be recovered later for auction after the transition to digital. In his letter of June 26, 1996 to Hundt, Representative Barney Frank found this second letter from Gingrich, et al. to be “an explicit repudiation” of the promise made in the previous letter, noting that no related spectrum legislation was ever considered, and it was “a wholly inappropriate method to bypass the legislative process.”

The June 19 letter from Gingrich, et al. also urged the FCC to “move forward as expeditiously as possible” and provided support for the commission action tentatively laid out in their *Fifth Further Notice of Proposed Rulemaking*, released May 20, 1996.

Adopting the ATSC/Grand Alliance DTV Standard

In this *Notice*, the commission proposes to *adopt* the ATSC DTV standard, and to “*require* the use by digital television licenses of each element of the ATSC DTV standard” (emphasis added). Such action is “appropriate because it would provide a measure of certainty and confidence to manufacturers, broadcasters, and consumers, thus helping assure a smooth implementation of digital broadcasting.”²

With the emergence of a single standard, the commission must merely endorse rather than select a single standard. Furthermore, the proposed single standard is “flexible” in several respects, eliminating many of the disadvantages traditionally associated with mandating an inflexible standard. With respect to scanning configurations, there are 18 video scanning formats allowed by the ATSC DTV standard, only some of which are “high definition.” The broadcaster would be able to select the appropriate format for specific applications. This freedom makes the standard more palatable for those opposed to the mandate of an exclusively high-resolution format. Transmitting in high definition might not always be appropriate nor be the most efficient use of spectrum. In addition, other provisions of the standard are recommended, not required. Mandating a standard with such inherent flexibility and options is not deemed a highly restricting action.

The standard is also flexible due to the inherent “headroom,” which would accommodate improvements in technology. An important feature of the standard is the packetized transport structure. Each packet of data includes a packet identifier (PID) which identifies the packet’s payload. DTV receivers recognize these PIDs, although new services could be introduced through new PIDs. While such extensions might require new decoders or receivers, the extensibility of the standard allows new services to be introduced without commission action and without disrupting existing DTV service.

Such extensibility was stated as a criterion to be designed into the standard. In addition, the concept of interoperability was a predetermined requirement accommodated by the Grand Alliance standard. An “interoperability review panel” set forth 11 characteristics necessary to ensure interoperability with the needs of alternative media systems. ACATS feels that these needs have been satisfied in the Grand Alliance standard. It should be noted, however, that critics of

the standard within the computer industry have argued that the standard is still driven by the limitations imposed by the broadcasting industry, especially through the inclusion of interlaced scanning, and they have questioned the level of interoperability.

Additional stated benefits of requiring this FCC standard include:

- The certainty of a required single standard would help to move the process forward. Such a requirement would reduce the risk for manufacturers and, most important, for consumers by diminishing obsolescence of new purchases.
- Requiring a standard will also serve to bring equipment costs down. Such action will help to protect the future of our free and universal system of broadcasting, increase programming choices, and provide a rare opportunity to increase spectrum efficiency.

In sum, the advantages of requiring this particular standard appear to outweigh the disadvantages, and the commission seems heavily inclined to adopt it. Those opposing the mandate are given the burden of persuasion to convince the commission that such action would be inappropriate. Even a somewhat reluctant Chairman Hundt, who is an admitted skeptic of government-mandated standards, joins his colleagues in issuing the *Fifth Notice* that proposes requiring the standard. However, a recent *New York Times* article depicts an increasingly skeptical Hundt who, according to the author of the article, “has been looking for a good reason to stop the proposed digital television standard.”³ In the article, Hundt appears to be giving increasing credence to those who oppose the standard in the film and computer worlds, citing personal objections he received from such powerful figures as Steven Spielberg and Bill Gates. Hundt is quoted as saying, “It’s not an industry consensus if only broadcasters and manufacturers agree.”

As critics try to convince the commission that this standard does not meet their needs, members of Congress and the broadcasting industry continue to call for decisive and immediate action. The degree to which such grievances will be addressed remains to be seen, and the push and pull that has characterized the entire proceedings will continue throughout the next several stages of standard setting. While it appears a direction has been set, it is only tentative and is subject to comment. The process has taken several interesting and unexpected turns thus far, and there is always the

possibility that it might be redirected yet again in the near future.

Drawing upon comments and reply comments received on this and a subsequent *Notice* on channel allocations, the FCC will issue a *Final Report and Order* on digital television, tentatively scheduled for release sometime in early 1997. In the interim, many unresolved issues need to be addressed. Identifying the specific standard is only a small part of the standards-setting process. After agreeing on what to adopt, there are many issues connected with *how* to implement a new standard, of which the aforementioned spectrum debate is only a small part. The most fundamental concern underlying the entire process should be ensuring that the public interest is well served throughout and after the transition.

Protecting the Public Interest

While the standards process has been coordinated by the government, it has been clearly driven by private industry. The dissension in the communications industry with respect to this technology has ensured that the process moves forward only incrementally. The input provided by private industry has not only guided the evolution of the Grand Alliance standard, but it has also dominated the public record of the proceedings. For the most part, the general public is unaware of the ongoing proceedings, as the issue has received very little attention from the media.

There are several explanations for this dearth of coverage. For example, there are few significant newsworthy "highlights" to report, and media organizations have a difficult time reporting ongoing, slow-moving phenomena. There are many unresolved related issues, and media organizations tend to avoid ambiguity in determining topics for coverage. The topic is a highly-complex issue, and it would be difficult—if not impossible—for the public to comprehend the variables involved. Furthermore, it is not perceived as a *timely* topic for the technology will not be publicly available for several years.

A more cynical explanation would charge that media organizations are engaging in an act of self-imposed censorship to protect their own corporate plans, and that they would rather wait to discuss the technology when it can be properly promoted through marketing. Although the issue has been under-reported, it has not been entirely ignored, especially by the print media. One story, in particular, was widely distributed by the Knight-Ridder News Service and appeared in newspapers across the nation in late

December 1995. The article presented a somewhat negative account of the upcoming transition to digital television and was unusual in that it explicitly referenced the ongoing proceedings and provided mail and e-mail addresses of commission members so that interested readers could provide their input.

As a direct result of this widely-published article, well over 100 letters and e-mail messages can be found in Docket 87-268 on Advanced Television. These letters either stand out or get buried in the docket, depending upon what a person is looking for. In presentation, they are informal and personal appeals, in marked contrast to the other comments received which are typically legalistic, economic, industrial, and technical.

In tone, these public letters are also unique because they are almost overwhelmingly negative. Many expressed concern and bewilderment over the whole process, and expressed a contentment with the existing system. Some letter writers took the opportunity to critique the current *quality of content* of television, and criticized broadcasters for being remiss in exerting responsibility. A high percentage of the letters expressed concern over the cost of investment in new receivers or converters, as it seemed that "free" television was about to get more expensive. Some writers stated that they were on fixed incomes and would find it hard to purchase required equipment. One gentleman's short, handwritten note bluntly expressed this concern: "Leave TV alone. Got no money for new TV type HDTV. Poor got nothin but TV, and rich want to take that away."

Although some of the letters revealed that the writers were misinformed about the timeframe with which their existing sets would become obsolete, such input should not be dismissed outright. It is hard to predict consumer behavior with respect to a technology that does not even exist—especially if you are the consumer. Here is a suggestion that the existing consumer demand for a new system is not overwhelming, and that it will take time to create and fuel the need and establish the market.

Ensuring Consumer Feedback

While there are benefits of encouraging such direct public input, in the end, it proves difficult because the intricacies and complexities of the process make it difficult for the average citizen to comprehend and provide well-informed contributions at this point in time. Advocates representing the public sector, well versed on the issues, should be more visible in the

process. Although some nonprofit organizations like the Benton Foundation (a public policy agency) have contributed to the formal discussions, there is not nearly enough input on the public's behalf. Such input would help to provide a sense of balance to a discussion that has been dominated and directed by private interests, and would create a more complete record of comments upon which to base a U.S. DTV strategy.

Ultimately, the responsibility to ensure that whatever DTV policy emerges will reflect and protect the public interest rests with the FCC. Balancing public policy objectives, such as the preservation of a free and universal broadcasting system, ensuring diversity of programming, and encouraging consumer access to new services, FCC policy makers have been engaged in determining the degree to which a new television standard will enable or harm these goals. In laying out their final strategy, the government must attempt to ensure that the transition to DTV benefits the general public. And when they think of the "public," they must not think in terms of aggregates of electronics consumers or media audiences or categories of innovation adopters, but conceptualize a far broader, inclusive, and ultimately more diverse and heterogeneous group. This objective of ensuring the public benefits of a new standard is what should drive the process and ground the strategy that emerges.

One way of achieving this objective is to ensure that the public has a future say in the direction and development of digital television. Although noticeably absent from the discussions thus far, the public should have a significant say once the technology enters the marketplace. Much of the momentum behind the strategy has rested on assumptions that there will be a high and immediate interest in this technology. These assumptions should be tested, and not taken as givens. In other words, the strategy should be flexible and be able to accommodate consumer preferences and behavior.

The setting of a specific timeframe for the transition to generate revenues at a predetermined date for budget deliberations would be inappropriate. To determine the end of the transition before it begins would be premature. Setting the standard, in and of itself, removes a great deal of uncertainty and should help protect corporate investments. To completely remove the risks for private industry by setting rigid rules which predetermine the fate and timing of the technology would deny or limit the public role in shaping and determining the next television system.

The inclusion of sunset provisions and future reviews would certainly help to incorporate flexibility into whatever government action is taken.

In other words, the strategy that emerges should provide enough certainty to propel the process forward, and allow interested organizations and consumers the opportunity to help define the technology in the marketplace. It should not be a comprehensive, rigid strategy, but a malleable one which allows for future action and refinement.

Defining Public Obligations

There is another area related to the digital transition that has profound implications for the public: What sort of obligations will broadcasters face in the digital age? Historically, the FCC was to serve as a "public trustee," granting permission to use the scarce and public airwaves in exchange for a commitment that the licensee serve the "public interest, convenience, and necessity." This vague obligation has been unenforceable and has often been neglected by previous commissions. As the transition to the digital age is being planned, Hundt and the FCC have a wonderful opportunity to redefine and restate the public responsibilities of broadcasters. Hundt has already alluded to some terms of digital license allocations that might be considered, including requirements for carrying educational and political programming.

Quite predictably, the National Association of Broadcasters has objected to what they see as an attempt to push a personal social agenda. Fellow Commissioner James Quello has also stated that such action is both premature and constitutionally improper.⁴ Nonetheless, Hundt should be commended for articulating a vision and pondering a DTV strategy that goes beyond the technical and economic issues to include important and neglected public policy concerns. Such action falls under the role of spectrum management, which implies some oversight, responsibility, and direction. Therefore, the FCC should not merely give away spectrum but, within reason, oversee its use. And such oversight goes beyond the technical task of ensuring spectrum efficiency and involves monitoring how such spectrum is being utilized.

Forgotten public interest objectives need to be articulated and widely disseminated, and support needs to emerge in this upcoming election year so that such pro-social intentions do not get buried by rhetoric and left out of the DTV implementation strategy.

Public opinion will be critical, and public sector advocates will face a formidable foe in the polished professionals who operate the nation's television stations. Broadcasters will most assuredly try to enter digital broadcasting on their terms, with few, if any, strings attached. This would be a victory for them and, in the long run, a defeat for the general public. The strength of our democratic system depends upon the vitality and diversity of our communications infrastructure. Improved technical capabilities and the increase in channel capacity inherent in the transition to digital do not, by themselves, guarantee that we will see significant qualitative improvements in our communications system.

These two directives—ensuring consumer feedback and defining public obligation terms for DTV license—indicate the strange blend of government intervention and market forces that should characterize the DTV strategy. In an age when government regulations are frowned upon, it is important to remember that limited government intervention is still, at times, necessary and desirable. This is especially true in the area of communication. Broadcasting entities are not only in the business of making money, they also help to make our culture. Such power carries with it some obligations not present in other industries. Complete corporate freedom and total reliance upon market forces will not ensure that our communication infrastructure is used to its fullest potential. In the digital age, communicators should be reminded of, not relieved of, their social obligations.

Moreover, the government should not understand deregulation to be an indication that they completely relinquish their duty to protect the public's interest. The DTV strategy that emerges should include reasonable terms to ensure that the public interest is served. Affected parties, including the public, should collectively define the phrase "public interest" and work to integrate this concept into the transition strategy. In the end, the goal is to see that this intricate and costly process of replacing our television system with a new communication system does more than just improve the technical capabilities of the system and provide more of the same or more benefit to the broadcasters. Rather, it should bring with it a much more significant qualitative improvement in our communication system. Policy makers, communication organizations, and the public must work together to create a vital new infrastructure, thus preventing the creation of a system that leaves us with an even greater wasteland of prettier pictures. 

¹ For a more detailed description of the evolution of the Grand Alliance standard, see D. Donnelly, "HDTV Standards Setting: Politics, Technology, and Industry," *New Telecom Quarterly*, Vol. 3, No. 3 (August 1995):20-26.

² U.S. Federal Communications Commission, *Fifth Further Notice of Proposed Rulemaking*, p. 15.

³ D. Caruso, "In Debate on Advanced TV, FCC Can Be Assertive," *New York Times/Cybertimes* (June 17, 1996).

⁴ J. Quello, "Statement of Commissioner James H. Quello Re: Programming Digital TV Channels and Children's Programming," from *Quello's Column*, posted on the FCC World Wide Web site. [On-line]. Available: www.fcc.gov.