Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Advanced Television Systems	)	
and Their Impact Upon the	)	MM Docket No. 87-268
Existing Television Broadcast	)	
Service	)	

REPLY COMMENTS OF THE NATIONAL CABLE TELEVISION ASSOCIATION, INC.

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The National Cable Television Association, Inc. ("NCTA"), by its attorneys, hereby submits its reply comments in response to the Fifth Further Notice of Proposed Rulemaking on Advanced Television Systems ("Notice"). NCTA is the principal trade association of the cable television industry in the United States. Its members include cable television operators serving over 80 percent of the nation's cable television subscribers and over 100 cable program networks that now command 50 percent of the viewership in cable households. Its members also include cable equipment manufacturers and others affiliated with the cable television industry.

INTRODUCTION AND SUMMARY

In our initial comments, we demonstrated that it would be a grievous error for the Commission to mandate a federal technology standard for digital television ("DTV"). Government-mandated standards freeze technology, reduce competition

and consumer choice, and raise regulatory barriers to innovation.[1] If those well-settled consequences of governmentally-imposed standards were not sufficient to dissuade the Commission, we also showed that in this particular case digital television is dynamic, currently available to consumers without government standards, and its development is sure to be impeded if government standards are adopted.[2] Finally, we observed that the type of standardization proposed in the Notice is inconsistent with the goals of the Telecommunications Act of 1996.[3]

We emphasized that our opposition to a governmentally-mandated digital television standard should not be read as opposition to the DTV system recommended by the Advisory Committee on Advanced Television Service ("Advisory Committee"). But the Advisory Committee's system should be given the opportunity to carry the day in the marketplace rather than be the subject of a Commission mandate. As we pointed out, once the DTV system becomes an FCC rule, it will be difficult to change except through protracted administrative rulemaking.

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[1] Comments of the National Cable Television Association, Inc., Fifth Notice of Proposed Rulemaking, MM Docket No. 87-268, filed July 11, 1996 at 5-11 ("NCTA Comments").

[2] Id. at 11-18.

[3] Id. at 18-19.

The comments filed in this proceeding demonstrate the validity of our approach. While a number of industries -- computer,[4] telephone[5] as well as cable[6] -- echo NCTA's conclusion that the government should not mandate a transmission standard, the very arguments contained in this record concerning the details of the proposed standard prove NCTA's point.

First and most significantly, the sharp disagreements between the broadcast and computer industries over the details of the standard argue for leaving the decision to the marketplace. In this regard, a number of commentors align against the broadcasters with respect to the details of the proposed standard and the effect that adoption of that standard would have on development of digital transmission systems and the costs to consumers. While the computer industry's concern over the proposed standard's inclusion of interlaced scanning technology has received the most attention on this score, others take issue with other aspects of the proposal.[7] These scientific and market-implementation disputes, among industries vital to the nation's technological future, demonstrate that a solution not mandated by government would best serve the nation's interest. When so many

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[4] See Comments of the Computer Industry Coalition on Advanced Television Service, July 11, 1996 at 6-16, ("CICATS"); Comments of Microsoft Corporation, July 11, 1996, at 4-5 ("Microsoft").

[5] See Comments of Pacific Telesis Group, July 11, 1996 ("PacTel") (opposing extension of any DTV standard to non-broadcast media).

[6] See Comments of Tele-Communications, Inc., July 11, 1996 ("TCI").

[7] See, e.g., Comments of Universal Studios, July 11, 1996 at 1 (opposing AC-3 audio coding system).

knowledgeable parties cannot agree with respect to the consequences of adopting a particular technology standard, it would be a grave mistake for the Commission to usurp the role of the marketplace.

The National Telecommunications and Information Administration's August 9, 1996 letter to Chairman Hundt underscores the lack of consensus among experts on the Advisory Committee standard.[8] After reviewing the comments in this proceeding, including the technical dispute about whether to adopt the Advisory Committee standard or something less as proposed by members of the computer industry, the NTIA now concludes that the Commission should not necessarily adopt the Advisory Committee standard but determine and adopt "only the essential elements of a DTV standard." The NTIA adds: "An industry-developed consensus on these difficult issues would be far preferable to a government imposed resolution or no resolution of these issues at all." That consensus, as NTIA's letter indicates, has not been reached; "There is a significant amount of disagreement among the parties."[9]

Second, the Commission need look no further than the Broadcasters' own comments for evidence of the dangers of government-mandated standards. For example, the Broadcasters urge the Commission not only to adopt the proposed

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[8] Letter of Hon. Larry Irving, Ass't. Secretary of Commerce for Communications and Information to Hon. Reed E. Hundt, Aug. 9, 1996, Docket No. 87-268.

[9] Of course, even if an "industry-developed consensus" were reached, it does not need to be adopted by the government any more than standards in other important areas have been, as NCTA showed in its Comments.

standard for delivery of broadcast DTV, but also insist that the Commission extend the required standard to other media as well as incorporating it into receiver specifications.[10] In this regard, they urge the Commission to "take all steps necessary to ensure that the cable industry adopts the ATSC DTV standard."[11] The Broadcasters also in effect insist that burdensome -- and unconstitutional -- new must carry obligations be imposed on the cable industry.[12]

This approach should come as no surprise. Uncertain of the ability of the DTV standard to win acceptance in the marketplace, its proponents not only want to steamroll its acceptance by the FCC, but also want it extended by government fiat to other media and to manufacturers. This proposal was too much even for some of the proponents of government standardization to stomach.[13] As discussed below, this brazen industrial policy doctrine should be rejected out-of-hand by the Commission.

The Commission should leave to the marketplace the decision of what DTV standard should be adopted for broadcast and, in no event, should it consider extending any DTV mandate to non-broadcast media.

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[10] See, Comments of Broadcasters, July 11, 1996 at 24-34 ("Broadcasters' Comments").

[11] Id. at iii.

[12] Id. at 24-32.

[13] See Comments of Mitsubishi, July 11, 1996 at 5 (supports FCC mandate for DTV standard but opposed adoption of even performance standard for receivers because it will stifle innovation and deny consumers options in price, features, etc.).

I. THE COMMISSION MUST REJECT THE BROADCASTERS' ENTREATIES TO IMPOSE A DTV BROADCAST TRANSMISSION STANDARD

Our initial comments detailed the reasons why the government should not mandate technology standards in general and the DTV standard in particular. Government-mandated standards will freeze technology, reduce competition and consumer choice and will erect regulatory barriers to innovation. Particularly in a field as dynamic as digital transmission, the Commission would be making an irreversible error if it imposed a DTV standard on the industry. Government fiat is no substitute for marketplace forces.

A. Declining to Impose Technology Standards By Government Fiat Has Ample Precedent

The academic literature demonstrates that government imposition of technology standards has significant negative consequences.[14] We and others have also highlighted the numerous instances in which the Commission itself has eschewed adoption of technology standards.[15] This array of precedent alone should be enough to give the Commission pause in this case. But additional arguments can be found in the actions of other governmental entities.

It is generally recognized that mandatory design standards, such as those proposed for DTV, are more harmful to competition and innovation than

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[14] See NCTA Comments at 13-14; CICATS Comments at 10-12; TCI Comments at 9-10; Compaq Computer Corporation Comments at 8 ("Compaq").

[15] See NCTA Comments at 14 (DBS, cellular, PCS); Microsoft Comments at 2 (DBS, cellular, PCS); Compaq Comments at 9 (PCS, cellular); TCI Comments at 1 (PCS, DBS, MMDS, DARS), 6 (C-Band satellite cable programming).

performance standards. (In the context of DTV, a performance standard would permit the use of any technology that did not cause undue interference with other technologies). This point was made in President Clinton's Council of Economic Advisors February 1996 Economic Report of the President:

> Efforts to reinvent regulation are taking a variety of forms. One important step ... is a shift in emphasis from prescribing methods of compliance to specifying desired outcomes.
>
> Executive Order 12866, which the President signed on September 30, 1993, reflects the [Clinton] Administration's basic philosophy and principles for regulatory planning and review.
>
> To make regulation less burdensome, the order states that, wherever possible, agencies specify regulatory goals in terms of performance standards, which specify desired outcomes, rather than design standards, which prescribe methods of compliance. Performance-based regulation lowers the cost of compliance by allowing a variety of compliance options and encouraging technological innovation. In contrast, the input-oriented, design standards approach tends to raise the cost of achieving regulatory objectives by limiting flexibility.[16]

The Commission itself has extensive experience with the adverse consequences of mandating compliance with privately-developed design standards. For example, the Commission for many years enforced AT&T's prohibition on "foreign attachments" to the telephone network. Foreign attachments consisted of any telephone equipment not manufactured by AT&T, whether or not it interfered with the use of the telephone network by others. Eventually, the Commission

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[16] Economic Report of the President, February 1996, at 133-34 (emphasis in the original).

came to recognize the anticompetitive consequences of this policy, and opened the market to unregulated competition.[17]

Other federal agencies have recognized the deleterious effects of mandated standards. The Office of Management and Budget, in a 1993 report, stated "While market incentives reward innovation, command-and-control regulations, particularly technology-based standards, provide little or no incentive for regulated parties to seek less costly or more effective means of achieving a particular standard."[18]

In the same vein, the Federal Trade Commission, in its 1983 report on standards and certification, stated

> [M]andatory standards and certifications can be analyzed as a form of government-granted monopoly power, which like patents, can absolutely prevent new competition. Entry problems are particularly acute in the case of innovative producers (e.g., novel product designs, innovative use of materials).... Proof of conformance to standard requirements or proof of equivalence of an innovative product to conforming products may impose significant costs on the innovator. Delays in the standards revision and certification processes may seriously dissipate the lead-time advantage necessary to recapture a firm's investment in innovative activity. In addition, an innovator may run the risk of nonpersuasion when a standards developer or certifier rejects proof of conformance or equivalence for reasons unrelated to the adequacy of the proof offered or the merits of the innovation. Even a standard that once reflected the state-of-the-art can become a barrier to innovation as technology progresses.[19]

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[17] See Brock, Gerald W. Telecommunications Policy in the Information Age (1994) at 81ff; Hush-A-Phone Corp. v. FCC, 238 F.2d 266 (1956).

[18] Office of Management and Budget, Regulatory Program of the United States Government - April 1, 1992-March 31, 1993, at 12.

[19] Federal Trade Commission, Standards and Certification, Final Staff Report, April 1983, at 60-61.

And in 1991, the staff of the FTC's Bureau of Economics and its San Francisco Regional Office cautioned the FCC against mandating technology standards for Digital Audio Radio Services, concluding:

> The staff believes that the FCC should consider leaving decisions on technological standards to the market.... In many instances the market will operate to resolve efficiently the standard-setting issues. Furthermore, in those instances where the market will not achieve the efficient result, there is no reason to believe that a regulatory selection will achieve a preferable outcome.[20]

It is not difficult to find real-world examples of government-mandated standards that stifle the innovative and the efficient. For example, consider automobile headlights. The FTC, in its 1983 Report, discusses a Society of Automotive Engineers (SAE) standard for headlights that was subsequently mandated by the National Highway Safety Administration. The standard eventually prevented the timely adoption of a type of headlight (replaceable halogen bulb) that had become widely used in Europe. NHTSA took several years to modify the standard despite cost, safety, and performance advantages offered by the newer headlights.[21]

With the academic literature, FCC precedent and other governmental opinion and experience all aligned against imposition of the DTV standard, the proponents of such a standard should be required to present a particularly

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[20] Comment of the Staff of the Bureau of Economics and the San Francisco Regional Office of the Federal Trade Commission, Gen Docket No. 90-357, filed January 25, 1991 at 22 ("FTC Staff Comment")

[21] FTC 1983 Report at 92.

compelling case if they expect the Commission to adopt their position. This they have not done.[22]

B. The Comments in Support of Standardization by Government Fiat Are Not Persuasive

Comments supporting government imposition of a standard are not persuasive. Their arguments can be reduced to three claims: (1) there is something "unique" about broadcasting that "compels" government adoption of a standard;[23] (2) an industry consensus developed around a standard is irrelevant unless "comprehensive implementation is assured" by government fiat;[24] and (3) alternatives are inadequate.[25] None of these arguments can withstand serious scrutiny.

Implicitly recognizing the Commission's aversion to imposing technological standards in most of the areas subject to its jurisdiction,[26] the broadcasters argue that broadcasting is different. But, there is nothing "unique" about broadcasting that would make inapplicable the arguments that government-mandated standards

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[22] In this regard, we agree with the comments of CICATS that the Commission has improperly placed the burden of persuasion on opponents of government-mandated standards. CICATS Comments at 59.

[23] Broadcasters' Comments at 15-20; See also Comments of Digital HDTV Grand Alliance, July 11, 1996 at 6 ("Grand Alliance"); Comments of Advanced Television Systems Committee, July 11, 1996 at 7 ("ATSC").

[24] Broadcasters' Comments at 20-23; Grand Alliance Comments at 5-6; ATSC Comments at 7-8.

[25] Broadcasters' Comments at 23-24; Grand Alliance Comments at 12-15; ATSC Comments at 12-15.

[26] See NCTA Comments at 14-16.

freeze technology, reduce competition and consumer choice and erect regulatory barriers to innovation.

Instead they argue that "certainty that there will be a single standard, capable of improvement over time, is critical to the introduction of services like DTV, where value is derived from the nationwide network of program producers, local transmitters and home receivers operating on compatible technologies."[27] Putting aside the fact that a government-mandated standard has very little chance of being "improved over time" without the arduous task of completing an FCC rulemaking proceeding biased toward the status quo, this argument assumes that all affected industries -- from program producers to receiver manufacturers -- must be compelled to adopt the chosen standard. As we discuss in the next section, extending a governmentally-imposed standard to non-broadcast medium, let alone to receivers, is against the public interest.

In the context of the "uniqueness" argument, the broadcasters raise the familiar red herring of AM stereo.[28] They argue that AM stereo's failure to win acceptance in the marketplace was the result of the Commission's refusal to adopt an AM stereo transmission standard "because a well-functioning, but lower quality,

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[27] Broadcasters' Comments at 15-16 (emphasis added).

[28] Broadcasters' Comments at 19-20 ("Our experience with AM stereo demonstrates how the failure to respond to the challenge of open networked technologies can stifle the emergence of a broadcast technology").

technology already existed and the likely demand for the new technology was uncertain -- as will be true with DTV."[29]

This argument has been addressed and debunked by commenters in this and earlier proceedings. In comments in the 1991 DARS proceeding, the FTC Bureau of Economics staff laid to rest the AM stereo myth. As the FTC staff said with respect to the AM stereo experience:

> The staff believes, however, that the facts perhaps better support a different interpretation: that the market did choose a standard, but that most consumers did not value the new technology more than it cost. Moreover, the facts seem to support the interpretation that the failure initially to allow the market to select an AM stereo standard contributed to the delays in the provision of AM stereo, and, in all likelihood, its relatively low acceptance by consumers.[30]
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> * * *
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> As Besen and Johnson note, the failure of AM stereo may simply reflect an absence of market demand: consumers simply may not value AM stereo broadcasting enough to justify the purchase of higher cost AM stereo receivers. Indeed, given the apparent emergence of Motorola as the standard, it is not clear what, other than insufficient demand, is now impeding the growth of AM stereo broadcasting.[31]

In sum, the FTC staff concluded that the "AM stereo episode cannot be accurately characterized as a full-fledged experiment with market determination of technological standards."[32]

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[29] Id. at 19.

[30] FTC Staff Comment at 30.

[31] Id. at 31-32 (footnote omitted).

[32] Id. at 33.

In their comments, CICATS also addressed the AM stereo issue. There they correctly observed that Commission elimination of NTSC transmissions "will stimulate consumer demand for digital television products, for both the broadcaster and the consumer, which might otherwise be lacking.[33] As CICATS concludes: "Unlike the AM [stereo] case, once NTSC transmissions are ended, consumers will need to upgrade their television equipment (either by set-top devices or new digital receivers) to receive any broadcast television."[34]

In any event, while couched in benign economic terms such as "positive externalities,"[35] the Broadcasters' argument boils down to a claim that the broadcasters do not trust consumers and the marketplace (impersonally categorized as "externalities" in their arguments) to make rational economic decisions. But, as Dr. Bruce Owen pointed out in a Declaration submitted with NCTA's initial comments, marketplace dynamics simply do not support the claim that over-the-air viewers are potentially harmed by a hands-off government policy.[36]

The "certainty" that advocates for a mandatory standard crave -- assuming it is the certainty of acceptance of a particular standard and not certainty of a profit

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[33] CICATS Comments at 15, n. 35.

[34] Id. (emphasis in original).

[35] Id. at 16, 17 ("The adoption of a single DTV transmission standard reduces their risks and is justified by the existence of externalities....")

[36] Owen Declaration, attached to NCTA Comments, at 13-14.

for particular companies -- can be achieved without a government-mandated DTV standard. The evident industry consensus achieved by the Advisory Committee demonstrates that the marketplace can work its way to acceptance of a standard. The Commission has already concluded that it should impose a technological standard only when private industry either will not or cannot produce a standard.[37] That obviously is not the case here.

But the standard advocates' second argument is that the apparent industry consensus does not negate the need for a standard. Instead, they argue, that industry consensus was achieved only because of a "widespread expectation" that the FCC would ultimately adopt an industry-endorsed standard, and that "[w]ithout the promise of an adopted standard for DTV at the end of the road, it is quite possible that market forces would not have achieved the development of a consensus standard."[38]

This is the rankest of speculation with little basis in fact. If the standard as proposed is as good as the Advisory Committee says it is -- as noted earlier, we take no position on the merits of the standard -- and if it is worth urging its imposition on broadcast and non-broadcast entities (as the broadcasters propose), then it should be a standard the industries which recommend it should be willing to stand behind and adopt on their own, without the heavy hand of government compelling its adoption.

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[37] Notice at ¶ 31.

[38] Broadcasters' Comments at 21.

In any event, it is unlikely that the only reason that a consensus was achieved was the purported promise of a governmentally-mandated standard. This cause-effect claim is utter fiction if one looks to the record. The Commission itself has been of many minds regarding imposition of such a standard throughout the course of this proceeding. As early as the initial 1987 Notice of Inquiry in this proceeding, the Commission stated that "mandatory standards may no longer be necessary and may even be counterproductive,"[39] and that there are benefits "that could come about through improvements in technology made subsequent to the establishment of standards, and we do not wish to foreclose these possibilities."[40] These quotes are not from the pleadings of NCTA, CICATS or any other commentor. It is the FCC speaking, nearly a decade ago, at the outset of this proceeding.

And while the Commission made subsequent statements evidencing an intent to adopt a standard, it also has indicated that developments since then -- including the presence of a single consensus standard -- "arguably change[ ] the balance of considerations "[41] Indeed, by asking for comment on whether the government should adopt a DTV standard, the Commission implicitly rejects the argument that the agency is estopped from refusing to do so.

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[39] Notice at ¶22, citing Notice of Inquiry, MM Docket No. 87-268, 2 FCC Rcd 5125, 5135 (1987) ("First Inquiry").

[40] Id., citing First Inquiry, 2 FCC Rcd. at 5136.

[41] Id. at ¶27.

And even if the Commission had stated unequivocally that it would adopt the Advisory Committee's standard, and even if the industry consensus would not have been achieved without such a representation, that is no reason to freeze digital technology in place by government edict now that an industry consensus has developed. This is especially true if the record, as it does, demonstrates why standards adoption is inadvisable.

Finally, the standard adoption advocates argue that alternatives to government imposition of a standard are "inadequate." While we agree with the contention that the Commission should not adopt only parts of the proposed standard, it does not follow that leaving selection of an acceptable standard to the marketplace is inappropriate.

Their fears -- that "[r]eliance on an industry standard rather than an adopted standard would be inadequate, because the risk that voluntary adherence would be incomplete is too great,"[42] -- are not compelling. Indeed, in the very next sentence the Broadcasters' comments reiterate the "broad industry acceptance of the DTV standard" -- an acceptance which renders government intervention superfluous.[43] In sum, there not only is a more than adequate alternative to FCC adoption of the DTV standard, there is an alternative -- reliance on the

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[42] Id. at 23-24.

[43] They also cite the "substantial space [the standard] provides for innovation," without acknowledging that, if codified into regulation, it would require Herculean efforts to change the DTV standard. Id. at 24.

marketplace -- which is superior. The rapid growth of technologies without government involvement prove this point.

II. THE BROADCASTERS' EFFORTS TO IMPOSE THE OVER-THE-AIR DIGITAL STANDARD ON OTHER MEDIA REVEALS THE DANGER OF GOVERNMENT- IMPOSED STANDARDS

The Commission need look no further than the Broadcasters' comments for evidence of the dangers of government-mandated standards. Indeed, among the first arguments they make is that the Commission should "take all steps necessary to ensure that the cable industry adopts the ATSC DTV Standard."[44] The Broadcasters take this extreme position even though the Commission has acknowledged that the DTV standard "has been optimized for terrestrial digital television delivery, where channel bandwidth is limited and transmission errors and data loss are likely."[45] As we said earlier in this proceeding, imposing the broadcast transmission standard on cable television will not just impede innovation, but it will also artificially constrain cable's delivery of advanced television service and other digital technologies for years to come.[46]

Since NCTA filed its initial comments opposing government-mandated digital standards, NAB and MSTV have busied themselves issuing unwarranted invective about cable's motives.[47] However, their own filing lays plain the

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[44] Broadcasters' Comments at iii.

[45] Notice at ¶15 (emphasis added).

[46] See NCTA Comments in MM Docket No. 87-268, November 20, 1995 at 17.

[47] See, e.g., Communications Daily, July 12, 1996 at 2.

Broadcasters' intent to place obstacles in the path of the cable industry and other media in their efforts to develop digital technology for their subscribers. The Broadcasters show no tolerance for any deviation from their preferred standard.[48] In fact, they contend that cable systems themselves should bear the costs of ensuring commonality with the broadcast DTV standard.[49] By limiting cable television and other media to the over-the-air digital standard, the Broadcasters only seek to ensure a protected status and to deny the American public the benefits of a thriving and dynamic digital marketplace that is evolving quite well without government intervention

The Broadcasters also would set in stone in the standard onerous must carry obligations by requiring cable operators to set aside scarce capacity to accommodate a range of new broadcast services. Given the lack of any factual predicate for digital must carry requirements and the legal uncertainties surrounding the existing analog rules, the Commission has ample reason to avoid imposing any aspect of broadcast DTV standards on cable, especially when such action could greatly disadvantage cable programming networks, cable systems and the cable subscriber.

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[48] See Broadcasters' Comments at 13 (claiming that "disruption that would be caused by any variance in the transmission technologies adopted is too great a risk.")

[49] Id. at 29.

A. Imposing the Broadcast DTV Standard on Cable and Other Media Will be Detrimental to Consumers

As discussed in our comments, the mere existence of a standard freezes innovation as companies are reluctant to invest in research and development and build new products that may deviate from the government standard. A government standard also is likely to encroach on other technologies because incumbents tied to the standard will seek to extend it to their competitors. And these perils are not just theoretical in this case. The Broadcasters are campaigning now to put a brake on the dynamic development of digital technology for cable and other media.

Broadcasters assert that satellite, cable and other operators could "seek to divide the broadcast and other industries with competing standards tailored to their specific modes of distribution."[50] But, as we have pointed out, the vast majority of the American public receives its video programming by means other than over-the-air broadcasting. This being the case, why shouldn't cable operators, DBS operators and others be encouraged -- let alone permitted -- to develop digital transmission technology which would best serve the interests of their subscribers rather than serve the broadcast industry's narrow interest and narrow over-the-air audience? Why should these technologies be held hostage by the broadcast

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[50] Id. at 21.

medium when they offer different attributes and capabilities for viewers and when they are already deploying innovative approaches to digital technology? [51]

Cable television is a closed medium -- its carefully contained spectrum can be manipulated and used to deliver digital programming at twice the data rate of over-the-air television. With hundreds of cable programming services available and new advanced services available now and on the horizon, the cable industry should be able to use its systems to maximum efficiency to serve its subscribers in an increasingly competitive multichannel provider market. Codifying the Broadcasters' DTV standard in page after page of government regulations will only stifle these developments and place a major stumbling block in the path to future innovation.

As reason to limit cable to over-the-air technology, the Broadcasters cite the industry's involvement in the FCC's Advanced Television Advisory Committee. In that process, the Commission set out a course in 1987 to facilitate the broadcast industry's transition to an advanced technology. The Advisory Committee, which was comprised primarily of representatives of the broadcast industry, was focused

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[51] See e.g. TCI Comments in Fourth Further Notice of Proposed Rulemaking, MM Docket No. 87-268, November 20, 1995 at 21-23. See also Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, CS Docket No. 95-61, released December 11, 1996 at ¶173 ("Many different communications companies are in the midst of deploying new and improved system architectures to increase the bandwidth and efficiency of their distribution facilities.") The ATSC standard is based on the discrete cosine transform (DCT) technology used in the Motion Picture Experts Group (MPEG) protocol There are variations on the DCT and MPEG protocols that may offer advantages and there are other video compression approaches which show promise, such as those based on wavelets, fractals and other mathematical foundations. Cable and other multichannel providers should be allowed to experiment with these evolving technologies to benefit their subscribers.

on developing an over-the-air DTV broadcast system. In recognition of its role in the retransmission of broadcast signals, the cable industry, largely through Cable Labs, participated in the laboratory and field testing of the Grand Alliance system to ensure that it was suitable for distribution over cable networks and would allow cable to use its double data rate capabilities. But while the few cable representatives on the Advisory Committee voted in favor of the broadcast DTV system, the industry did not abandon its ability to develop digital transmission schemes that optimize cable's unique characteristics.[52]

Nevertheless, Broadcasters argue that digital TV will succeed only if all industries deploy digital technology in lock step with the over-the-air broadcast industry. They surmise that a battle over competing standards would leave some consumers with useless equipment and without free television service.[53] As we have seen, however, digital technology advances in DBS, cable and elsewhere are moving apace to the public's benefit without government standards, demonstrating that voluntary consensus-building on compatibility and inter-operability will work.

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[52] The Broadcasters attempt to bolster their argument for imposing the broadcast DTV standard on cable by claiming that "EIA and the cable industry filed jointly affirming the need to standardize the system used for digital transmissions." Broadcasters' Comments at 28-29 (citing Comments of Cable-Consumer Electronics Compatibility Advisory Group, ET Docket No. 93-7, January 25, 1994 at 22). In that proceeding, however, the Cable-Consumer Electronics Advisory Committee was supporting voluntary inter-industry digital transmission specifications in the context of achieving compatibility between cable and consumer electronics equipment. The industries were not endorsing a government-mandated digital television standard. Indeed, in the same filing, the Advisory Committee cautioned against the adverse consequences of even voluntary premature standardization which "could hinder the development of new services or new features in consumer electronics products or other technological advances." Advisory Group Comments at 22-23.

[53] Broadcasters' Comments at 22.

Moreover, early adopters of DTV receiving equipment are likely to be high-end equipment users rather than the broad television viewing public.[54] The public investment in analog receivers will be protected because the transition to digital will be gradual. As digital technology evolves, analog-only viewers will continue to be served by broadcast stations, cable systems and other video providers until there is sufficient market penetration. As the technology settles down, the market will sort out the best system or systems. Nonetheless, the size and dominance of the broadcast industry as a provider of programming and a supplier to 33% of the nation's households provides powerful incentives for manufacturers to build digital sets for broadcast transmission when the broadcasters adopt an industry standard.[55] And, contrary to the Broadcasters' claims, there is no reason to believe that affordable equipment will not be produced that will allow access to alternative video delivery systems simultaneously.[56]

B. Digital Services will be Quickly and Affordably Introduced with Set Top Equipment

The Broadcasters attempt to cloud the standardization issue by drawing something nefarious out of cable's provision of set top equipment. They claim that cable's use of set top equipment will impede the ability of viewers to receive

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[54] See Owen Declaration at 12.

[55] See NCTA Comments at 16-17.

[56] As discussed below, the cable and consumer electronics industry are developing a Decoder Interface Connector that will permit multiple competitive video providers to connect to new cable-ready television receivers.

broadcast signals. And they argue that consumers will be forced to purchase expensive sets with multiple decoders or proprietary set-top boxes if cable deviates from the broadcast DTV standard.[57] These arguments are completely disingenuous.

First, all consumers with analog equipment -- and there are some 250 million such receivers with at least a 15-year lifespan already in the market -- will need some type of set top box to receive digital signals whether the programming source is over-the-air, cable, DBS or wireless. As the Broadcasters themselves have recognized, we are a long way from penetrating the consumer market with digital television sets. Indeed, as we noted in our comments on the Fourth Further Notice of Proposed Rulemaking ("Fourth Further Notice") in this proceeding, the broadcasters have made it clear that they intend to make digital services available to analog viewers by selling their own set top equipment.[58]

Second, set top devices will actually speed the economical introduction of a multitude of digital services and features to the public that would otherwise not be available because of the embedded base of analog receivers. These devices will benefit all digital transmissions -- broadcast, cable, wireless and satellite.

Third, the Cable-Consumer Electronics Advisory Group (C3AG) is developing a hybrid analog/digital multipin Decoder Interface Connector for future cable-ready equipment that will permit competing video providers, retailers and equipment

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[58] NCTA Reply Comments, Fourth Further Notice, MM Docket No. 87-268 at 20.