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

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

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

REPLY COMMENTS OF THE COMPUTER INDUSTRY COALITION ON ADVANCED TELEVISION SERVICE

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Summary

In 1987, when this proceeding was initiated, it was about analog high-definition television. Times have changed, the standard in question is now digital, and the current state of technology is such that it would be foolhardy not to expand the scope of this proceeding beyond limited consideration of digital broadcast television ("DTV") to encompass issues concerning the larger National Information Infrastructure and DTV's place within that Infrastructure. If the growth and development of the NII matters to the Commission, the Commission should give serious consideration to arguments for a more computer-compatible DTV standard than the one ACATS has endorsed.

As to the need for a mandated DTV standard, electronics manufacturers supporting the ACATS standard have insisted that a mandated, rather than voluntary, standard is needed to provide certainty to broadcasters, manufacturers, and consumers. At the same time, these parties have opposed mandated receiver standards, claiming that the industry will provide adequate certainty that receivers will be compatible with the transmission standard. In addition, these parties have argued that industry, rather than government, should be responsible for reviewing and modifying the adopted standard. The glaring inconsistencies between these positions highlight the speciousness of the ACATS proponents' insistence on a government-mandated standard and provide support for CICATS's position that a voluntary industry-set transmission standard would be preferable to one mandated by the government.

The ACATS standard's proponents have also corroborated the consumer cost estimates CICATS made in its initial Comments and, indeed, have made statements suggesting that those estimates may be understated *vis-a-vis* consumers' costs for ACATS-compatible receiving equipment. Moreover, CICATS has performed a sensitivity analysis of its initial cost study which supports the conclusions reached in that study namely, that adoption of the ACATS standard will impose enormous costs on consumers, a large portion of which could be avoided if a more streamlined standard, such as CICATS's proposed minimal base-line format, is implemented.

Proponents of the ACATS standard have perpetuated a host of inaccuracies which must be addressed. Notwithstanding their claims that the ACATS standard has "unmatched" compatibility with computers, the fact is -- as proved by CICATS's participation in this proceeding -- that the standard is not compatible enough. Several elements of the standard erect formidable and costly roadblocks to computer interaction with DTV. The standard would be vastly improved by omitting these elements and thereby fostering greater interaction between DTV and computers.

Although the ACATS standard's defenders have made almost heroic attempts to justify inclusion of interlaced scanning in the standard, these efforts ring hollow. The overwhelming weight of evidence -- particularly the submissions by numerous MIT academics who were involved in the development of the ACATS standard -- shows that there is no reasonable justification to

include any interlaced scanning formats in the ACATS standard. Interlaced scanning is perhaps the greatest obstacle to computer compatiblity, and therefore CICATS strongly urges that the DTV standard be entirely progressive-scan.

Claims by the ACATS standard's advocates that consumers want HDTV and are willing to pay for it are unsubstantiated and in fact contradicted by abundant evidence. The (at best) lukewarm interest of consumers in HDTV, coupled with the high costs of ACATS-style HDTV, spell trouble for broadcasters if the ACATS standard is adopted. The high cost of ACATS DTV receivers will likely drive consumers away from over-the-air broadcasting and to other video transmission media that are not burdened by the costs and rigidity of the ACATS DTV standard.

Admonitions that the failure to adopt the ACATS standard will open the door for the European DVB standard to gain a competitive edge in world markets are unfounded. Although the European standard is inferior to the ACATS standard, it is vastly inferior to the CICATS base-line format proposal, which does not support obsolete technology, such as interlaced scanning, that is included in the European standard. Thus, adoption of the CICATS, rather than ACATS, proposal would provide greater assurance that the European standard will not dominate world markets. In any event, the existence of a competing standard in Europe does not justify hasty adoption of an inferior standard here.

The investments proponents of the ACATS standard claim to have made to develop the standard are neither impressive nor legitimate as a justification for adopting the standard.

Finally, despite claims to the contrary, the concerns raised herein by the computer industry were unwelcome during the development of the ACATS standard, because those concerns were (and continue to be) at odds with proprietary interests of the dominant forces behind the standard. The computer industry's concerns are well-founded and raise significant public interest questions that must be addressed.

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REPLY COMMENTS OF THE
COMPUTER INDUSTRY COALITION
ON ADVANCED TELEVISION SERVICE

The Computer Industry Coalition on Advanced Television Service ("CICATS") submits these Reply Comments to the initial comments filed in response to the Fifth Further Notice of Proposed Rule Making ("Fifth NPRM") in this proceeding.[1]

INTRODUCTION

When this proceeding was commenced in 1987, very few people had even heard of the "Internet," and the term "National Information Infrastructure" was years away from being coined. Digital broadcast television was believed to be impossible, and a progressive-scanned high-definition television picture was unfathomable. The focus of this proceeding was on the development of an

[1] *Advanced Television Systems and Their Impact Upon the Existing Television Broadcast* Service, MM Docket No. 87-268, Fifth Further Notice of Proposed Rule Making, FCC 96-207 (released May 20, 1996) ("Fifth NPRM").

analog HDTV transmission standard. *Since then, things have changed dramatically.*

In recent years, digital broadcast television ("DTV") and progressive-scanned HDTV have become reality, the NII has grown into a national priority, and the focus of this proceeding has evolved into consideration of a transmission standard for "Advanced Television." In light of these momentous changes, the Commission faces a critical choice: Either look backward, ignore the winds of technological change, and ensure that progress will soon make the adopted DTV transmission standard -- and quite possibly, over-the-air broadcasting -- obsolete and irrelevant; or look forward, use only the best technology available, and create a transmission standard whose flexibility and compatibility with computers will ensure that the standard keeps pace with innovation and, by evolving, will endure -- and possibly preserve free, over-the-air broadcasting.

Adopting the ACATS standard would be a step backward. Adopting, or allowing industry to adopt, a more streamlined, flexible, and compatible standard would be a step into the future.

In their comments, proponents of the ACATS standard have acknowledged the ability of industry to establish suitable standards. CICATS concurs with this general proposition and again urges the Commission to allow industry to establish a standard for DTV transmissions with the Commission's

guidance, but without government mandate of a detailed standard (much less 18 detailed standards).

Adoption of the ACATS standard would be particularly onerous for consumers, because it would impose enormous costs on purchasers of digital receiving equipment, as statements by proponents of the ACATS standard themselves confirm. A large portion of these costs could be avoided by adoption of a more streamlined standard.

Proponents of the ACATS standard have propagated a number of myths concerning both that standard and the alternative minimum base-line standard CICATS proposed in its Comments. The most egregious of these myths are that the ACATS standard is sufficiently compatible with computers and that the inclusion of interlaced scanning in the standard is justified. As demonstrated in Section III below, these myths, and others, are either factually inaccurate, completely irrelevant to the more critical issues in this proceeding, or both.

For the reasons set forth herein and in CICATS's initial Comments, CICATS continues to urge that a voluntary industry-set DTV transmission standard would be preferable to a government-mandated standard; but that, if the Commission determines that a mandated standard would best serve the public interest, the standard should be minimally restrictive, extremely flexible, and highly conducive to computer compatibility and future technological innovation.

The proposed ACATS standard has none of these characteristics, and should be rejected. Adoption of the ACATS standard would saddle the United States with a technologically obsolete, rigid system, retard the convergence of television and computers, cost consumers tens of billions of dollars more than necessary, and harm the U.S. economy.

In contrast, a minimum base-line standard such as CICATS proposed in its initial Comments[2] would satisfy all of the foregoing criteria and would therefore be preferable. A base-line standard would result in significant savings to consumers, compared to the ACATS standard, and would therefore accelerate public acceptance of DTV and reclamation of spectrum now used for analog television broadcasting. Adoption of the base-line DTV standard CICATS has proposed would not delay implementation of digital television: Because it is designed to use only the best elements of the ACATS standard, there is no need to question its feasibility. If the ACATS proponents' endorsements of the same elements in their own proposal are legitimate, they apply with equal, if not greater, force to the CICATS base-line format proposal.

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[2] In light of the initial comments filed by Digital Theater Systems, L.P. ("DTS") and MCA/Universal, CICATS amends the base-line proposal it described in Exhibit B to its initial Comments to recommend that the audio coding component of the adopted standard *not* be limited to the Dolby AC-3 system, which the ACATS standard exclusively prescribes. The filings by DTS and MCA/Universal demonstrate that at least one alternative audio coding technique exists that is superior to the ACATS audio system, and the adopted standard should support use of this technique. According to DTS, opening the DTV standard to allow use of the alternative coding technique DTS has described would neither increase consumer costs nor necessitate modifications to receiving equipment. DTS Comments (filed July 10, 1996) at 2; DTS Reply Comments (filed August 6, 1996), cover page ("The DTV Open Platform Audio Standard").

I. Proponents of a Government-Mandated Transmission Standard Concede that Industry Is Capable of Establishing Adequate Standards.

While arguing vehemently that the Commission must mandate a DTV transmission standard, proponents of the ACATS standard have also argued (inconsistently) that industry, not government, is best suited to establishing standards for DTV receiving equipment, and further, that industry is best suited to determine when and how any adopted transmission standard should be modified.[3] Broadcasters, while advocating a mandated transmission standard, insist that there should be *no* mandated amount of HDTV programming or simulcast DTV programming during the transition to an all-digital environment.[4]

All these inconsistencies undermine the ACATS proponents' arguments for a mandated transmission standard, and substantiate the position of CICATS and others[5] that a standard voluntarily adopted by all affected industry segments (but not mandated by the government) would eliminate the numerous drawbacks inherent in government-mandated standards.

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[3] *See, e.g.,* Comments of the Digital HDTV Grand Alliance (filed July 11, 1996) ("Grand Alliance Comments") at 10-12, 28; Comments of the Advanced Television Systems Committee (filed July 11, 1996) ("ATSC Comments") at 11-12, 28-29; Comments of the Electronic Industries Association and the EIA Advanced Television Committee (filed July 11, 1996) ("EIA Comments") at 10-12, 18-20; Comments of Thomson Consumer Electronics (filed July 11, 1996) ("Thomson Comments") at 6-7, 14-15; Comments of Zenith Electronics Corporation (filed July 11, 1996) ("Zenith Comments") at 5-6, 14-15.

[4] Comments of the National Association of Broadcasters on the Fourth Further NPRM (filed November 20, 1995) ("NAB Comments") at 4-6.

[5] *E.g.,* Comments of Microsoft Corporation (filed July 11, 1996) ("Microsoft Comments") at 2-5; Comments of Compaq Computer Corporation (filed July 11, 1996) ("Compaq Comments") at 1-14; Comments of the Business Software Alliance (filed July 11, 1996) ("BSA Comments"); Comments of the National Cable Television Association (filed July 11, 1996) ("NCTA Comments"); Comments of Tele-Communications, Inc. (filed July 11, 1996) ("TCI Comments") at 4-20.

It is particularly mystifying how proponents of the ACATS standard can justify a government-mandated transmission standard primarily by alleging that it will create "certainty" for manufacturers, broadcasters, and consumers,[6] while simultaneously asserting that voluntary industry (TV manufacturers') action is sufficient to provide the certainty that all consumer DTV equipment will be able to receive the adopted standard with all of its varying formats.[7]

Taken at face value, the claimed need for certainty would seem to require that the Commission mandate receiver standards if it mandates the ACATS transmission standard, since receivers that are incompatible with any of the ACATS standard's formats would go black when incompatibly formatted programming is transmitted, destroying any "certainty" a mandated transmission standard might provide. Such uncertainty would surely be unacceptable for broadcasters, advertisers, and consumers.

Under the ACATS standard, the only way to avoid black screens, and thus achieve some certainty, is to force all consumers to bear the high cost of HDTV decoding capability, whether they want it or not, a result which CICATS firmly opposes and which the Electronic Industries Association ("EIA") would seem to find repugnant, having said:[8]

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6 *E.g.*, Grand Alliance Comments at 5; ATSC Comments at 6; EIA Comments at 4; Thomson Comments at 4; Zenith Comments at 3; Comments of Sony Electronics, Inc. (filed July 11, 1996) ("Sony Comments") at 8; Comments of Philips Electronics North America Corporation (filed July 11, 1996) ("Philips Comments") at 4-5.

7 *E.g.*, Grand Alliance Comments at 28; ATSC Comments at 28-29; EIA Comments at 18-20; Thomson Comments at 14-15; Zenith Comments at 14-15.

8 Reply Comments of the Electronic Industries Association and the Advanced Television Committee (filed January 22, 1996) ("EIA Reply Comments") at 12-13.

> Just at it did in 1992 [when it declined to prescribe standards for dual-mode ATV/NTSC receivers], the Commission should continue to rely on the marketplace and should neither require the manufacture of, nor compel the purchase of, ATV receivers that consumers do not want, do not need, or simply cannot afford. Nor should the Commission deny consumers the opportunity to purchase lower-priced NTSC equipment that meets their viewing needs. In the absence of any identifiable marketplace failure to satisfy consumer needs, there is no reason for the Commission to inject itself in the highly competitive consumer electronics industry. As in the past, the Commission should allow marketplace forces to determine the capabilities of ATV sets and the prices at which they will be sold.

Like these manufacturers, the National Association of Broadcasters ("NAB") has claimed simultaneously that a mandated transmission standard is needed to provide "certainty," but that no DTV simulcasting requirement for broadcasters is necessary during the transition to digital television, because marketplace forces will ensure optimum use of the new spectrum:

> Rather than interfering with marketplace dynamics at the sensitive early stages, the Commission should simply be silent with regard to simulcasting, and let broadcasters do what they do best -- provide programming that attracts viewers. Such a marketplace approach will lead to the most rapid development of a vibrant market and result in a faster ATV transition and consequent faster recovery of NTSC spectrum.[9]

CICATS, too, believes in the ability of the marketplace to respond most efficiently to consumers' tastes. It is impossible to comprehend, however, how

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9 NAB Comments at 5.

the NAB can justify reliance on marketplace forces to ensure the best use of the digital channels while discounting the ability of those forces to set a satisfactory transmission standard. If a mandated transmission standard is required for "certainty," it would seem that a mandatory DTV programming requirement would be needed to provide certainty that consumers will embrace the new format. Indeed, the Grand Alliance has advised that "[HDTV] programming needs to be *consistently* available to consumers to motivate them to invest in digital HDTV receivers."[10]

CICATS has argued in its Comments that the "certainty" the ACATS standard's proponents claim would result from mandating their standard is illusory, since the standard's complexity would require universal use of expensive, sophisticated receiving equipment to provide any certainty that all consumers can receive all program formats. Far greater certainty (and at far lower cost) for all concerned would result from adoption of a more streamlined, economical standard, such as CICATS's proposed base-line format.

Finally, the ACATS standard's proponents force the Commission to ask why industry is *incapable* of establishing an appropriate transmission standard if it is *capable* of reviewing and modifying the adopted standard so as to obviate the need for a government-mandated sunset or review process.[11] Industry,

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[10] Reply Comments of the Digital HDTV Grand Alliance (filed January 22, 1996) ("Grand Alliance Reply Comments") at 15 (emphasis in original).

[11] *E.g.*, Grand Alliance Comments at 10-12; ATSC Comments at 11-12; EIA Comments at 10-12; Thomson Comments at 6-7; Zenith Comments at 5-6.

guided by marketplace forces, is best suited to establish an optimum DTV transmission standard and to ensure that the standard improves over time; but if government adopts a standard, it should also provide for frequent reviews to ensure that the standard keeps pace with technological innovation.

In words equally relevant to this proceeding, Commissioner Quello recently criticized the FCC's (then-) proposed Children's Television educational programming requirements as being "as intrusive and overregulatory as anything I have witnessed in more than two decades at the FCC."[12] Decrying the detail, inflexibility, and burdensomeness of the proposed regulations, Commissioner Quello wrote:[13]

> [C]laims of marketplace failure are outdated and farcical. The main legislative and regulatory thrust today must be toward competition and deregulation . . . . . Thus, it is increasingly difficult, logically and legally, to justify additional regulation of broadcasting, the only medium providing universal free service.

CICATS urges the Commission to consider Commissioner Quello's concerns in the context of its proposed adoption of the ACATS standard, itself a rigid, inflexible, burdensome example of overregulation that marketplace forces, left alone, would never produce.

In a similar vein, Larry Irving, Assistant Secretary of Commerce for Communications and Information, recently wrote[14] that

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12 James H. Quello, "The FCC's Regulatory Overkill," *The Wall Street Journal*, July 24, 1996 ("Regulatory Overkill"), at A20.

13 *Id.*

14 Letter from Larry Irving to Hon. Reed E. Hundt (August 9, 1996) ("Irving Letter").

> [a]ny standard that is adopted must allow for maximum flexibility to accommodate future technological developments . . . . An overly prescriptive standard may stymie the development of new products and services. . . .
>
> Therefore, the Administration believes that it would be in the public interest for the Commission to determine and adopt only those elements of a DTV standard necessary to accomplish the goals discussed above: ensuring that there is sufficient certainty to allow the transition to DTV to proceed smoothly and quickly in the United States and encouraging the widespread adoption of American technology abroad. By mandating adoption of only the essential elements of a DTV standard, the Commission will ensure that the door will not be closed to future technological developments. It will also permit the marketplace to determine which features of DTV are most desirable and will promote the evolution of DTV, including migration to an all-progressive scan system. . . .
>
> The Administration also believes that the best solution for the many difficult questions that have arisen in this proceeding would be for the interested parties to reach a consensus on the disputed issues. . . . An industry-developed consensus on these difficult issues would be preferable to a government-imposed resolution or no resolution of these issues at all.

CICATS concurs that a voluntary industry-developed DTV standard would be far preferable to a government-prescribed standard, particularly one as detailed and inflexible as the ACATS standard.

II. CICATS's Consumer Cost Estimates Have Been Corroborated by Proponents of the ACATS Standard.

As CICATS demonstrated in its initial Comments, adoption of the ACATS standard would impose monumental costs on consumers because receiving equipment would have to be sophisticated enough to receive even the most data-rich high-resolution formats prescribed by the standard lest it go black during programming transmitted in such formats. CICATS's cost estimates were conservative, and may even have been understated.[15] Their validity has been confirmed by numerous statements by proponents of the ACATS standard.

For example, CICATS has estimated that, in 1998, the retail price of a set-top converter capable of decoding the full ACATS standard would be $713.[16] Dr. J. Peter Bingham, President of Phillips Research, Philips Electronics North America Corporation, has estimated that in the latter half of 1998, the price of an ACATS set-top converter would be between $600 and $750.[17] (The same year,

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[15] CICATS's estimates focused on retail prices, not production costs, since *consumers'* costs, not producers' costs, should be the Commission's primary concern. CICATS understands that proponents of the ACATS standard have prepared production cost estimates, although CICATS has not obtained any of these estimates. CICATS cautions the Commission to bear in mind when reviewing any production cost estimates that there is often a 1:3 relationship between production costs and retail prices (*see* Exhibit A hereto); therefore, any production cost estimates provided by proponents of the ACATS standard -- if they are even reliable -- must roughly be tripled to approximate retail prices.

[16] Comments of the Computer Industry Coalition on Advanced Television, (filed July 11, 1996) ("CICATS Comments") Exhibit C at 5, Table 1.

[17] Written Testimony of Dr. J. Peter Bingham before the Committee on Commerce, Science, and Transportation of the United States Senate (June 20, 1996) ("Bingham Testimony") at 14.

CICATS-compatible converters would retail for only $288, according to CICATS's estimates.[18])

Similarly, CICATS has estimated that in the first year of production, a television receiver decoder capable of receiving the full ACATS standard would retail for $1,275, exclusive of the retail price of the cabinetry and display device (*e.g.,* cathode ray tube or "CRT").[19] This estimate is *lower* than estimates by television manufacturers themselves.

According to Bruce Allen, Vice President of Thomson Consumer Electronics, if the ACATS standard is adopted, in the early years of DTV, ACATS DTV receivers will retail for approximately $1000 to $1500 *more than* comparably sized NTSC receivers.[20] Former Zenith Electronics Chairman Jerry Pearlman has estimated the "premium" price of each ACATS-compatible set in the early years to be $2,000 *above* the price of comparably priced NTSC

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18 Exhibit C to CICATS Comments at 5, Table 1.

19 Exhibit C to CICATS Comments at 5, Table 1. According to CICATS's estimates, a base-line format-capable receiver decoder would retail for a third of the ACATS receiver decoder's price. *Id.* CICATS's price estimates for receivers and personal computers were limited to the retail prices of the internal signal decoding electronics components. CICATS's estimates for set-top boxes, however, were for the retail prices of such boxes as sold. *See id.*

20 Testimony of Bruce Allen before the Federal Communications Commission's *en banc* hearing (December 12, 1995) ("Allen *en banc* Test."), Tr. 215. Mr. Allen said that the price difference was the "premium [for HDTV capability] over comparable NTSC sets." *Id.*

equipment.[21] Other equipment manufacturers have estimated the price of early ACATS-compatible sets to be $3,500.[22]

Mr. Pearlman has also estimated that, in the fourth year of production, assuming that *10 million* digital receivers have been sold, a digital standard definition ("SDTV") television (*i.e.*, without HDTV capability) would retail for $400 to $550 more than a comparable NTSC set, and an HDTV-capable receiver would retail for $400 more than the SDTV set or $800-$950 more than a comparable NTSC set.[23] Again, the manufacturers' own estimates are higher than those made by CICATS in its initial Comments, which estimates were still three times the estimated prices of base-line format DTV decoders.[24]

The estimates by Messrs. Allen and Pearlman apparently apply across-the-board, *i.e.*, the premium price of an ACATS set above the price of a comparably sized NTSC set will basically remain constant, regardless of the size of the set. In other words, a consumer will have to pay a similar premium for a 12" receiver in his children's room or for the 36" large-screen home theater system in the family room. And this is so regardless of the fact that, according to

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21 "Broadcasters Celebrate HDTV Success," *Television Digest,* November 13, 1995, at 1; Mr. Pearlmans's estimate assumed annual production of 2 million sets. Michael Feazel, "I Want My HDTV," *Stereo Review*, July, 1996 ("Feazel") at 25

22 Edmund L. Andrews and Joel Brinkley, "The Fight for Digital TV's Future," *The New York Times*, January 22, 1995, at section 3, p.1.

23 Memorandum from JK Pearlman to Reed Hundt (November 27, 1995) ("Pearlman Memo") (cited in EIA Reply Comments at 6, n.6. Note that EIA has mischaracterized Mr. Pearlman's estimates, completely ignoring the clear distinction Mr. Pearlman made between the price of an SDTV digital television and the price of an HDTV receiver. *Compare* EIA Reply Comments at 7 *with* Pearlman Memo.)

24 Exhibit C to CICATS Comments at 5, Table 1

ACATS Chairman Richard Wiley, the improved quality of HDTV programs will be discernible only on receivers with 35" (or larger) screens.[25] By their own statements, ACATS proponents admit that many -- probably most -- consumers will be forced to pay the significant premium for HDTV quality they will not be able to see!

To test the sensitivity of its original estimates to various factors, CICATS has performed a sensitivity analysis of those estimates, and, in doing so, has refined its original estimates.[26] We now believe that the aggregate cost to consumers of converting their NTSC receivers to full ACATS-standard-compatibility after a ten-year transition period could be as much as **$150 billion -- $60 billion more than originally estimated.**[27] The fact that the receiver manufacturers' own estimates exceed CICATS's original estimates confirms the legitimacy of the higher estimates.

CICATS's more refined cost analysis differs from the analysis presented in CICATS's initial Comments in three principal ways.

First, CICATS has refined its per-unit retail price calculations in a manner consistent with the apparent approach of some ACATS proponents.[28] Second,

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25 Chris McConnell and Don West, "Dick Wiley, Delivery on Digital," *Broadcasting and Cable*, December 4, 1995, at 32.

26 *See* Lee L. Selwyn, "Economic Considerations for Digital Television Proposals: Refinements and Sensitivities," Exhibit A hereto

27 *See* Exhibits C and D to CICATS initial Comments.

28 Exhibit A hereto explains that CICATS has employed a slightly different approach to calculating the per-unit cost of ACATS and CICATS decoders. Whether using CICATS's original methodology or the current approach, the ultimate result for consumers is the same: Enormous

CICATS's economic consultant, Economics and Technology Inc. ("ETI"), has re-forecast the penetration pattern of digital television based upon that of color television. Third, the earlier assumption that Moore's Law will continue to operate to halve the price of memory and computation every 24 months has been revised to test the effect if Moore's Law does not persist at the current rate over the entire 10-year transition to DTV as some have predicted.[29]

The last refinement, which assumes Moore's Law will operate to halve certain costs every 36 months, more closely approximates ACATS proponents' estimates that equipment costs will drop by 20% per year,[30] for a compounded cost reduction of approximately 50% every 36 months.[31]

As set forth in greater detail in Exhibit A hereto, under CICATS's refined analysis, the estimated aggregate costs to consumers under both the CICATS base-line format proposal and the ACATS proposal would be greater than originally estimated: but a base-line format standard could still **save consumers**

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costs under the ACATS standard that could be avoided by employing a base-line format approach to DTV.

29 Exhibit A hereto describes these revised assumptions in greater detail. The theory that the effects of Moore's Law will at least slow was discussed by Stanford Electrical Engineering Professor Fabian Pease on the National Public Radio show "Morning Edition," on July 15, 1996. As explained in Exhibit A, CICATS's refined analysis merely assumes that Moore's Law will slow and in future years will halve the price of computation and memory every 36, rather than 24, months.

30 EIA Reply Comments at 8, n.15 (citing "Europe to Delay HDTV," *Television Digest*, September 25, 1995, at 6; "Hitachi Decoder Could Ease Move to HDTV," *Consumer Electronics*, September 18, 1995, at 13)

31 By originally assuming that Moore's Law would halve prices every 24 months, CICATS may have significantly understated the price of ACATS equipment, given ACATS proponents' claims that prices will drop 20% every year (or only 36%, compounded, in 24 months). *See supra*, note 30.

approximately $75 billion over a ten-year transition period relative to the ACATS standard. In other words, in the aggregate, consumers would pay half as much to transition to DTV under the CICATS base-line format approach as they would pay under the ACATS standard.

The reason for this substantial savings is that, unlike the ACATS proposal, the CICATS base-line format does not force consumers to purchase HDTV capability, though CICATS's proposal would permit broadcasters to offer HDTV to consumers who are willing to pay for HDTV equipment. This advantage would seem to be consistent with EIA's position that[32]

> many Americans, particularly those of modest means, will want to enter the digital age either by purchasing a less expensive SDTV receiver or a low-cost digital converter for their NTSC receivers (just as many consumers continued to purchase black and white televisions well after color sets became available). Moreover, even affluent consumers may not be interested in investing in an HDTV capability for small-screen or occasionally used television receivers. An HDTV-display requirement would therefore substantially and needlessly raise the cost of ATV receivers for those consumers that are not interested in -- or cannot afford -- HDTV quality pictures

EIA fails to note that by requiring all sets to be HDTV-capable to avoid occasional black screens, the ACATS standard would force consumers to pay the premium for HDTV decoding capability even if their screens can not display an HDTV picture.

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32 EIA Reply Comments at 13-14.

At a minimum, the Commission should scrutinize the estimated costs to consumers of the different proposed standards and weigh those costs against the claimed benefits of each proposal. CICATS submits that the ACATS standard's immense costs are not justified by even the most optimistic predictions of its benefits.[33]

In addition, as CICATS explained in its initial Comments, the high costs of the ACATS standard will slow the migration to digital television and the eventual reclamation of NTSC television spectrum for other uses and revenue generation. These conclusions have been corroborated by CICATS's sensitivity analysis described in Exhibit A hereto (at Tables D-1, D-2, and D-3).

The HDTV experience in Japan further demonstrates the likelihood of a slow migration to ACATS-based DTV: Even though Japan mandates a minimum of 13 hours of HDTV programming daily (more than even the Grand Alliance has proposed mandating here), the high cost of Japanese HDTV sets[34] has held down the penetration of HDTV to 100,000 sets through 1995, though industry predicts sales of 300,000 sets by the end of this year.[35] If the Japanese experience is any indication, higher consumer costs for digital TV will mean a

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[33] Even if a base-line format standard is adopted, consumers' costs to transition to digital television will still be significant; therefore, in evaluating the costs and benefits of a mandated, rather than market-based, standard, the Commission should factor these costs into its calculus.

[34] Although Japan's HDTV system is analog, rather than digital, HDTV sets with 16:9 aspect ratios and 28" to 32" screens now retail for between $4,000 and $5,000. When originally introduced, the same sets retailed for $10,000. "High Definition Still Elusive," *Electronic News*, June 10, 1996, 39.

[35] *Id.*

slower migration path and a protracted period before NTSC spectrum can be reclaimed.

Even the NAB has admitted that "the initial cost of [HDTV-capable] receivers may be too high for rapid set sales; [therefore, a] service that delivers two channels of a higher quality picture than SDTV, but lower than HDTV, may turn out to be the marketplace's cost-benefit point."[36] NAB has also cautioned that "a backlash from consumers who feel that, after paying considerably more for new ATV receivers, they are getting only the same programming could depress the exciting prospects of this new service and delay significantly, if not doom, its acceptance."[37] The NAB is not alone in this view:[38]

> A number of observers question whether consumers will pay such large premiums [for full ACATS-capable equipment], especially since most don't even bother to fine-tune their existing TV sets.[[39]] "There's not enough focus on the consumer," said Mary Frost, an analyst for Price Waterhouse. "There needs to be some serious research on price points."

In judging the ACATS standard, the Commission should weigh the substantial public costs that would result from slower migration to DTV, both in

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36 NAB Comments, *supra*, note 4, at 3.

37 *Id.* at 5.

38 Feazel, *supra*, note 21, at 25.

39 Consumers are likely to be more willing to pay for DTV if the DTV standard is all-progressive scan, because the picture quality of an all-progressive SDTV transmission is superior to that of an interlaced SDTV signal, which is not significantly better than that of an NTSC signal.

terms of lost technological and business opportunities and lost (or at least delayed) spectrum-based revenues for public use

III. Many Arguments by Proponents of the ACATS Standard Are Misleading, Inaccurate, or Irrelevant to the Real Issues.

Perhaps recognizing the weaknesses of their factual position, proponents of the ACATS standard have embarked on a campaign to confuse the facts and sidestep the most critical issues surrounding adoption of a DTV standard. CICATS addresses the most common of the ACATS proponents' mythical arguments below.

A. The ACATS Standard Creates Significant Obstacles to Computer Compatibility.

If permitted to develop, the affordable convergence of television and computers will bring the American public enormous benefits. Commissioner Quello has written that "computers and the Internet are becoming the outlet of choice for our children's time and energy."[40]

Consistent with this notion, Assistant Secretary of Commerce Larry Irving has stated:[41]

> [A]though only the marketplace will determine whether "convergence" between computers and consumer electronics will occur, the FCC should not impose roadblocks to this possibility

In their earlier submissions, CICATS and others have detailed the numerous roadblocks to computer compatibility that certain components of the

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40 "Regulatory Overkill," *supra*, note 12.

41 Irving Letter, *supra*, note 14.