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August 12, 1996

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William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

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

Dear Mr. Caton:

Transmitted herewith, on behalf of Philips Electronics North America Corporation is an original and 11 copies of its Reply Comments in response to the Fifth NPRM in the above-referenced docket.

Please direct any questions that you may have to the undersigned.

Respectfully submitted,

Lawrence R. Sidman

Lawrence R. Sidman

Enclosures

Oll

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

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OFFICE OF SECRETARY
MAY 17 1996

In the Matter of)
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Advanced Television Systems)
and Their Impact Upon the)
Existing Television Broadcast)
Service)

MM Docket No. 87-268

**REPLY COMMENTS OF
PHILIPS ELECTRONICS NORTH AMERICA CORPORATION**

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TABLE OF CONTENTS

Executive Summary	i
I. INTRODUCTION	1
II. A BROAD CONSENSUS OF COMMENTERS RECOGNIZE THE NEED FOR AND SUPPORT THE ADOPTION OF A SINGLE TRANSMISSION STANDARD FOR TERRESTRIAL DIGITAL BROADCASTING	6
III. OPPONENTS HAVE FAILED TO MEET THEIR BURDEN OF PROOF TO SHOW THAT THE ATSC DTV STANDARD SHOULD NOT BE ADOPTED	9
A. The FCC's Adoption of the ATSC DTV Standard Will Not Be A Barrier to the Convergence of Television and Computer Technology ..	9
B. CICATS' Cost Analysis for DTV Receivers and Converters is Woefully Incorrect and Based Upon Flawed Methodology	12
C. The Presence of Interlaced Scanning Formats Enhances the Value of the ATSC DTV Standard Both to Broadcasters and Consumers	15
D. The CICATS Baseline Proposal Is Not A Serious Alternative to the ATSC DTV Standard	17
E. Opponents of the ATSC DTV Standard's 16:9 Aspect Ratio Fail to Make Their Case	18
IV. CONCLUSION	20

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**REPLY COMMENTS OF
PHILIPS ELECTRONICS NORTH AMERICA CORPORATION**

Executive Summary

In their comments in response to the Fifth NPRM, opponents of the Commission's proposed adoption of the ATSC DTV standard -- a small subset of the computer industry; the cable television industry; and a number of dissenters from the film community -- have utterly failed to meet the burden of proof appropriately placed upon them by the FCC. The common thread uniting opponents of the FCC's adoption of the ATSC DTV standard is that they simply do not share or do not care about the Commission's fundamental objective to enhance -- through the introduction of digital transmission technologies -- our nation's system of free, over-the-air broadcasting so that it may remain a top quality free option for consumers for many years to come.

The opposition represented by the cable industry and by CICATS, a coalition of 5 computer companies formed to oppose any DTV standard, is not suffused at all with the public interest but is animated by anticompetitive interests. The cable industry would prefer to see broadcasters mired in an analog world, offering consumers a second class, free service inferior to cable's digital, pay services, a scenario which ineluctably would lead to the demise of free, over-the-air broadcasting. The CICATS companies, evidently uncomfortable with the prospect of an alternative digital pipe into the home (precisely what will result from adoption of the ATSC DTV standard), seek to ensure that the computer, not the television set, will be the dominant household appliance for receiving and displaying digitally transmitted information. Moreover, CICATS desires that the development of this market

follow the "computer model" of rapid product turnover, necessitating repeated, frequent, high-dollar expenditures by consumers.

The specific objections and objectives expressed by the cable industry and CICATS flow smoothly from their anticompetitive motivations. Both oppose adoption of any DTV standard, a position at odds not only with almost all other commenters, but also with their own experts and with some of their own colleagues. Although cloaked in a professed desire not to freeze technology or stifle innovation, their opposition to any standard is rooted in their clear understanding that a DTV standard is absolutely necessary to achieving the level of technical, marketplace and investment certainty essential to the successful introduction of digital television in the United States. Unlike proponents of the ATSC DTV standard, however, they would be quite content to delay or even deny the digital television revolution.

The CICATS companies offer an alternative to the Commission, if it elects to adopt a DTV standard, proposing a non-existent, untested, minimum "base-line" standard consisting of only one, standard definition ("SDTV") video format. The very offering of this alternative insults the incredibly rigorous and exhaustive testing and review undergone by the ATSC DTV standard through the Commission's ACATS process. Moreover, the CICATS companies' proposal is vastly inferior in capability to the ATSC DTV standard, in part because it does not offer a high definition ("HDTV") video format. Finally, the cost analysis presented by the CICATS companies in defense of their alternative, supposedly justifying their claims that the ATSC DTV standard will cost consumers tens of billions of dollars in equipment costs, is absurdly erroneous and misleading, based upon fundamentally flawed methodologies and preposterous market penetration projections. Again, these fatal shortcomings are a logical outgrowth of CICATS' fundamental lack of interest in enhancing the free, over-the-air television system. Instead, they reflect CICATS' intention to transform this proceeding into a vehicle for forcing the accelerated convergence of the computer and television industries according to a product and cost model dictated by CICATS companies.

The concern expressed by certain film makers regarding the 16:9 aspect ratio of the ATSC DTV standard represents a minority view within the Hollywood community at odds with MPAA's well-reasoned support for the ATSC DTV standard set forth in its comments. Again, the objective of these film makers has little to do with the evolution of digital television or the practicalities associated with that development.

The argument of opponents that they were effectively shut out of the ACATS process is nonsense and unpardonable revisionist history. All affected parties, including the computer industry, film makers, and public interest groups had abundant opportunity to participate in the ACATS process and, for the most part, did so, and the concerns of these industries are reflected in the ATSC DTV standard. The fact that their views did not prevail *in their entirety* -- a viewpoint that likely could be echoed by each one of the individual participants in the ACATS -- reflects the natural and unavoidable compromises which occur in any open and competitive process. It does not mean that the process was defective; to the contrary, it shows that the process worked as it should.

At bottom, there is only one concern articulated by opponents of adoption of the ATSC DTV standard which has a kernel of legitimacy. CICATS and a number of other commenters want to ensure that adoption of the ATSC DTV standard will not be a bar to the convergence of the computer and the television. Philips and the other members of the Grand Alliance agree, and to that end, they have repeatedly stated that they support migration to all progressive scan video formats. Philips is prepared to commit to a process designed to achieve that goal, including timetables for progress reviews and creation of objective testing criteria and procedures as part of the implementation of the ATSC DTV standard after its adoption by the FCC. However, Philips categorically rejects the notion of adopting only the base layer of the ATSC DTV standard, i.e. the standard without the video formats, as a means of facilitating the migration to all progressive scan.

In sum, the record before the FCC clearly supports swift adoption by the FCC of the ATSC DTV broadcast transmission standard. An unprecedentedly united broadcast industry, the consumer electronics industry, the motion picture industry and representatives of consumers, senior citizens and organized labor have submitted abundant evidence that the ATSC DTV standard is a remarkable technological triumph. Their comments establish that adoption of the ATSC DTV standard will enable America to enhance its unparalleled system of universal, free over-the-air television by converting from analog to digital transmission, thus expanding enormously the capabilities of the medium to provide interactivity, interoperability with other media, especially computers, and data and information delivery. In addition, adoption of the standard will open new foreign markets to American-made DTV products and technology, yielding enormous economic opportunities and job growth in the United States. Moreover, it will yield the further dividend of making broadcasting a far more spectrum efficient service. In short, the record demonstrates that the ATSC DTV standard

fulfills the precise purposes for which it is intended with performance far superior to any other DTV transmission standard in the world. Philips implores the Commission to adopt immediately the proposed ATSC DTV broadcast transmission standard so that the United States can move into the 21st Century with a clear vision and an intelligent plan to bring about the digital television revolution.

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**REPLY COMMENTS OF
PHILIPS ELECTRONICS NORTH AMERICA CORPORATION**

Philips Electronics North America Corporation ("Philips") respectfully submits these reply comments in response to the Commission's Fifth Notice of Proposed Rulemaking ("Fifth NPRM") in its Advanced Television proceeding

I. INTRODUCTION

In the Fifth NPRM, the Commission proposed that it adopt the ATSC DTV standard as the basis for effectuating the transition from analog to digital transmission of free, over-the-air broadcasting in the United States. In appropriate recognition of the truly extraordinary, decade-long advisory committee process in which all affected parties participated, and the enormous investment of human and economic resources committed to the development of the ATSC DTV standard by the broadcasting and consumer electronics industries, the FCC correctly placed a heavy burden of proof on opponents of the ATSC DTV standard to demonstrate that its adoption was not in the public interest.^{1/}

In their comments in response to the Fifth NPRM, opponents of adoption have utterly failed to meet their burden of proof. The principal opposition to the adoption of the ATSC DTV standard comes from a small subset of the computer industry: five out of hundreds of

^{1/} Fifth NPRM at ¶54.

computer companies in the United States^{2/} which have banded together as CICATS to fight adoption of the standard, and their allies in the Business Software Alliance. They are joined in their opposition by the cable industry and a number of dissenters from the film community who disagree with MPAA's strong support for the standard.^{3/}

The common thread uniting opponents of the FCC's adoption of the ATSC DTV standard is that they simply do not share or do not care about the Commission's fundamental objective in this proceeding: to introduce enormous enhancements, through digital technology, into our nation's uniquely successful system of universal, free, over-the-air television.

For the cable industry and the CICATS cluster of computer companies, the prospect of broadcasters adopting digital transmission poses a distinct competitive threat. Their opposition is not suffused at all with the public interest but is animated by narrow, parochial and anticompetitive interests. The cable industry would prefer to see broadcasters mired in an analog world, offering consumers a second class free service inferior to cable's digital, pay services, a scenario which ineluctably would lead to the demise of free, over-the-air broadcasting. The CICATS companies, evidently uncomfortable with the presence of a new digital pipe into the home (precisely what will result from adoption of the ATSC DTV standard), seek to ensure that the computer, not the television set, will be the dominant household appliance for receiving and displaying digitally transmitted information. Moreover, CICATS desires that the development of this market follow the "computer model" of rapid product turnover, necessitating repeated, frequent, high-dollar expenditures by consumers.

2/ The Computer Industry Coalition on Advanced Television Service, or "CICATS," is comprised of only five computer companies: Apple, Compaq, Dell, Intel and Microsoft. Perhaps most notable about this coalition, however, are the many computer companies which have chosen *not* to associate themselves with CICATS, including: IBM, Digital Equipment Corporation, Sun Microsystems, Hewlett-Packard, Tektronix, Lotus, Silicon Graphics, Texas Instruments, Tandy, Oracle, Novell, 3Com, Cray, Gateway 2000, Toshiba, AT&T, Epson, Hitachi, Unisys, and Wang. CICATS' self-anointed title of being a "computer industry coalition" is thus largely exaggerated and misleading.

3/ Although some public interest groups also express reservations, their primary concern is about establishing a public interest responsibility for broadcasters incident to the transition to digital television (Benton Foundation Comments at 4-5) and relinquishment and auction of the NTSC channel (Media Access Project/Consumer Federation of America Comments at 6).

The specifics of the opposition expressed by the cable industry and CICATS flow absolutely logically from their anticompetitive motivations. Both oppose adoption of any DTV standard, a position at odds with almost all other commenters, including several associated with the computer industry and Professor William Schreiber, CICATS' principal economic advisor. Although cloaked in a professed desire not to freeze technology or stifle innovation, their opposition to any standard is rooted in their clear understanding that a DTV standard is absolutely necessary to achieving the level of technical, marketplace and investment certainty essential to the successful introduction of digital television in the United States. They have witnessed the lesson of the failure to adopt an AM stereo standard -- the launch of a new broadcast service is doomed -- and experience no qualms about replicating that failed scenario in the field of digital television.

Although the cable industry stops there, taking no position on the merits of the ATSC DTV standard, CICATS offers an alternative to the Commission, if it elects to adopt a DTV standard. CICATS proposes a minimum "base-line" standard consisting of only one video format, 480 vertical lines progressive scanned with square spacing of pixels and temporal layering for variable picture rates.^{4/} The most distinguishing characteristic of the CICATS proposal is that it does not exist. It is only a concept that has not been developed fully or tested at all, in marked contrast to the incredibly rigorous and exhaustive real time and real world testing undergone by the ATSC DTV standard. Its second most distinguishing characteristic is that it is vastly inferior in capability to the ATSC DTV standard, in part because it does not offer a true high definition ("HDTV") video format, i.e., 1080-vertical lines. Again, this fatal shortcoming is a logical outgrowth of CICATS' fundamental lack of interest in enhancing the free, over-the-air television system. CICATS views this proceeding as a vehicle for forcing the accelerated convergence of the computer and television industries. Its base-line proposal is crafted to do just that: impose a computer model for the developing digital TV marketplace, predicated on minimum "base-line" performance which will require consumers to upgrade constantly -- following the pattern established by the computer industry in its 286, 386, 486 and pentium processor hardware and successive mini-generations of operating software such as Windows. CICATS appears to have no reservations about denying consumers the benefits of true HDTV and denying consumers the benefits of receivers with long product lives.

^{4/} See, CICATS Comments, Vol. I, pp. 31-37, and Vol. II, Exhibit B.

The concern expressed by certain film makers regarding the 16:9 aspect ratio of the ATSC DTV standard represents a minority view within the Hollywood community at odds with MPAA's well-reasoned support for the ATSC DTV standard set forth in its comments. Again, these film makers' objective has little to do with the evolution of digital television or the practicalities associated with that development

The other common thread linking opposition to the ATSC DTV standard is a cavalier disregard for the voluminous record compiled by the Advisory Committee on Advanced Television Services ("ACATS") supporting adoption of the standard. Opponents argue that they were effectively shut out of the ACATS process and parade their positions before the Commission as if they were cases of first impression.^{5/} This is sheer nonsense. All affected parties, including the computer industry, the film makers, and public interest groups had abundant opportunity to participate in the ACATS process and, for the most part, did so. As delineated in the comments filed by the ATSC and the Grand Alliance, the concerns of these industries were accommodated to a remarkable extent in the ATSC DTV standard. The fact that their views did not prevail *in their entirety* -- a viewpoint that likely could be echoed by each one of the individual participants in the ACATS -- reflects the natural and unavoidable compromises which occur in any open and competitive process. It does not mean that the process was defective; to the contrary, it shows that the process worked as it should. It is patently offensive to sound principles of administrative law and procedure for opponents to engage in such a display of revisionist history. Accordingly, Philips believes and formally requests that the record compiled by the ACATS be made part of the formal administrative record in this proceeding.

At bottom, there is only one concern articulated by opponents of adoption of the ATSC DTV standard which has a kernel of legitimacy. CICATS and a number of other commenters want to ensure that adoption of the ATSC DTV standard will not be a bar to the convergence of the computer and the television. Philips and the other members of the Grand Alliance agree, and to that end, they have repeatedly stated that they support migration to all progressive scan video formats. Philips is prepared to commit to a process designed to achieve that goal, including timetables for progress reviews and creation of objective testing criteria and procedures as part of the implementation of the ATSC DTV standard after its

^{5/} See, CICATS Comments at 14-15; MAP/CFA Comments at 1; DemoGraFX Comments at 6,11-22.

adoption by the FCC. However, Philips categorically rejects the notion of adopting only the base layer of the ATSC DTV standard, *i.e.* the standard without the video formats, as a means of facilitating the migration to all progressive scan. This would not be a compromise but a totally unacceptable repudiation of the ATSC DTV standard which will deprive Americans of the enormous range of capabilities now embedded in the standard.

In sum, the record before the FCC clearly supports swift adoption by the FCC of the ATSC DTV broadcast transmission standard. An unprecedentedly united broadcast industry, the consumer electronics industry, the motion picture industry and representatives of consumers, senior citizens and organized labor have submitted abundant evidence that the ATSC DTV standard is a remarkable technological triumph. Their comments establish that adoption of the ATSC DTV standard will enable America to enhance its unparalleled system of universal, free over-the-air television by converting from analog to digital transmission, thus expanding enormously the capabilities of the medium to provide interactivity, interoperability with other media, especially computers, and data and information delivery. Moreover, it will yield the further dividend of making broadcasting a far more spectrum efficient service. In short, the record demonstrates that the ATSC DTV standard fulfills the precise purposes for which it is intended with performance far superior to any other DTV transmission standard in the world.

Finally, the record before the Commission also establishes the intolerable consequences of failure to adopt swiftly the ATSC DTV standard. The less capable, all interlaced format DVB standard being marketed so aggressively not only in Europe but in Latin America, Asia, and in some American markets, will emerge as a worldwide digital television transmission standard with consequent loss of American global technological leadership and many thousands of American jobs. The dream of HDTV will not be realized in the U.S. Broadcasting will become a second class service, and ultimately, American consumers will be deprived of the universal, free alternative to pay TV service. That is a bleak vision which the FCC will be responsible for transforming into reality if it does not act now to adopt the ATSC DTV standard.

II. A BROAD CONSENSUS OF COMMENTERS RECOGNIZE THE NEED FOR AND SUPPORT THE ADOPTION OF A SINGLE TRANSMISSION STANDARD FOR TERRESTRIAL DIGITAL BROADCASTING.

The overwhelming majority of commenters agree that the Commission must adopt a uniform transmission standard to ensure the success of DTV in the United States. This broad support comes not only from other DTV equipment manufacturers and broadcasters, but also from members of the computer industry,^{6/} the motion picture industry and creative community,^{7/} consumer groups,^{8/} and the Administration.^{9/} Moreover, the vast majority of these parties strongly support the Commission's proposed adoption of the ATSC DTV standard. Many of these parties recognize the extraordinary capabilities of the ATSC DTV standard, its positive contribution to development of the National Information Infrastructure, and the exciting benefits it promises American consumers: the dispositive role that a mandated standard plays in creating the necessary certainty for investors, broadcasters, manufacturers and consumers;^{10/} the exceptionally open and rigorous process through which the ATSC DTV standard was developed and tested^{11/}; the positive effect the introduction of DTV will have on domestic job growth^{12/}; and the need to adopt the standard quickly so that America's ever-diminishing lead in DTV technology will not slip away to foreign competitors.^{13/}

At the outset, it is important to reiterate a point that seems elusive to several commenters in the debate over the adoption of the ATSC DTV standard. *The ATSC DTV*

^{6/} See, Intel Comments at 3; DemoGraFX Comments at 3; and ITI Comments at 1.

^{7/} See, MPAA Comments at 8; Coalition of Film Makers Comments at i, 3; and MCA/Universal Studies Comments at 1-2.

^{8/} See, Comments filed jointly by the Consumer Federation of America and Media Access Project at 1-2; Citizens for HDTV Coalition Comments at 4; and John Carroll Comments at 1.

^{9/} See, National Telecommunications and Information Administration ("NTIA") Comments at 1.

^{10/} See, NTIA Comments at 1, Broadcasters' Comments at 1-2, Comments of William Schreiber at 1-2.

^{11/} See, ATSC Comments at 3-6, Broadcasters' Comments at 3-6.

^{12/} See, NTIA Comments at 1, Comments of Thomson Consumer Electronics at 2; and Comments of Citizens for HDTV at 5, 8, 16-17.

^{13/} See, NTIA Comments at 1-2.

standard was developed and is recommended by the ACATS as a transmission standard for terrestrial, over-the-air broadcast television. The standard is mandated for use only by terrestrial television broadcasters, not by cable television operators, computer hardware designers and software programmers, or equipment manufacturers. It is a standard designed to introduce, in a rapid but rational manner, quantum improvements in both entertainment television and data transmission capabilities to our system of free over-the-air television, while, to the greatest extent technically possible, facilitating the convergence of televisions, computers and telecommunications. In this regard, the ATSC DTV standard has exceeded beyond the wildest hopes of those who initiated this process nearly 10 years ago.

Not surprisingly, the principal opponents of the adoption of the ATSC DTV standard (indeed, to the adoption of any DTV standard whatsoever) -- a minority of commenters comprised of 5 computer companies and the cable television industry -- represent precisely those companies which *compete* with the over-the-air broadcasters and TV set manufacturers and stand to reap enormous competitive advantage if free over-the-air broadcasting is mired in an analog world and sinks permanently and irretrievably to a second-class video service. The Commission can reasonably conclude that these entities have no interest whatsoever in advancing digital television or in pursuing its enormous public interest and trade benefits. Their objective appears to be to delay endlessly or completely destroy the transition to DTV in the United States, and deny American consumers and American workers the rich rewards such a transition will bring.

CICATS and the cable industry specifically argue that the public interest will be served only if a voluntary, industry-set standard is allowed to emerge in the marketplace, similar to the manner in which personal communications services ("PCS"), direct broadcast satellite ("DBS") and cellular technologies have evolved.^{14/15/} Such an analogy is naive at best, for it fails to account for how our nation's over-the-air broadcast television system works and ignores the critical element of certainty indispensable to the birth and rapid growth of DTV in the U.S. that only a mandatory standard can provide.

^{14/} See, CICATS Comments at 10; and National Cable Television Association ("NCTA") Comments at 14.

^{15/} By inference, these parties believe the public interest would best be served if the Commission adopts a strategy similar to that which was employed for AM Stereo, which has been almost universally criticized as the wrong means by which to introduce new technological improvements to existing broadcast services.

The Comments filed by Philips, the Grand Alliance, ATSC, the Broadcasters and others in response to the Fifth NPRM preemptively rebutted the argument that adoption of a standard would stifle technology and product innovation, pointing out that just the opposite is true.^{16/}

The isolated opposition of CICATS and the cable industry to any DTV standard rests upon an analogy to DBS, PCS and cellular which fails to recognize that the successful introduction and growth of DTV will be uniquely and utterly dependent on certain "positive externalities" that play no similar role in closed systems such as cable, DBS, PCS and cellular services. Because DBS, PCS and cellular providers (and cable television) control both the transmission and receipt by subscribers of their services, these services can be modified or upgraded without risking disruption of service to their customers. Broadcasters, on the other hand, do not exercise similar control, and, as the Broadcasters' Comments articulately point out, must take a "leap of faith" that consumers will follow broadcasters in adopting the technology needed to receive DTV signals

There is a clear consensus among commenters that the FCC's adoption of a DTV broadcast transmission standard is absolutely critical to the launch of digital television in the United States.^{17/} The standard is needed both to ensure that consumers located anywhere in the U.S. can receive a high quality television signal on their TV set^{18/} and that broadcasters, equipment manufacturers, consumers and investors have the requisite certainty to make digital television a reality.^{19/} The NTIA, in its July 11, 1996 letter to the Commission, underscored the importance of the Commission establishing a DTV standard to promote certainty.^{20/} Even

^{16/} See, Philips Comments at 8-9; Digital HDTV Grand Alliance Comments at 3, 8-9; ATSC Comments at 3; Broadcasters Comments at 7; Thomson Comments at 6

^{17/} See, Comments of Broadcasters at i, ii, 1-2, 15-20; William Schreiber Comments at 2; National Consumers League at 1; ATSC at i, 2, 6; Electronic Industries Association/EIA Advanced Television Committee at ii, 7; Tektronix at 2; Circuit City at 3-5; Citizens for HDTV at 4,12; General Instrument at 2-3; Dolby Laboratories at 3; Zenith Electronics at 2-5; Sony Electronics at 1, 7, 8, 11. Mitsubishi Consumer Electronics America at i, 2; Hitachi America at 2-4; Thomson Consumer Electronics at 1,4; John Carroll at 1,4.

^{18/} See, Broadcasters Comments at 18-19.

^{19/} See, Broadcasters Comments at i, ii, 1-2, 15-20; ATSC Comments at i, 12-13; Thomson Comments at 7; Matsushita Comments at 4; Sony Comments at 1.

^{20/} See, NTIA Comments at 1-2.

commenters who expressed reservations about certain aspects of the proposed ATSC DTV standard nevertheless recognize that there is a clear need for the FCC to establish a DTV terrestrial broadcast transmission standard. For example, Intel, a participant in CICATS, urges adoption of a DTV standard because it is "essential to ensuring interoperability between televisions sets and computers."^{21/} Similarly, the Information Technology Industry Council, advocates prompt adoption and implementation of a DTV standard.^{22/} Finally, CICATS' own economist, Professor William Schreiber, states that, "to ensure stability [of investments in DTV], a standard must be set with sufficient detail so that the equipment initially installed by broadcasters and viewers alike will continue to operate successfully as the expected further development proceeds."^{23/} In short, the record in this proceeding requires the FCC to adopt some DTV standard.

III. OPPONENTS HAVE FAILED TO MEET THEIR BURDEN OF PROOF TO SHOW THAT THE ATSC DTV STANDARD SHOULD NOT BE ADOPTED.

Notwithstanding the forests downed by their comments, opponents of the ATSC DTV standard's adoption have failed completely to meet their burden of proof to justify the Commission's not adopting the standard it has proposed. Moreover, the opponents have done nothing to disprove the proposition that the standard is the most advanced, flexible and interoperable digital television standard in the world

A. The FCC's Adoption of the ATSC DTV Standard Will Not Be A Barrier to the Convergence of Television and Computer Technology.

CICATS' core criticism of the ATSC DTV standard is that the mere presence of interlaced scan formats will prohibit the eventual migration to full progressive scan and thus block the convergence of computers and televisions^{24/} That is simply false. In fact, the ATSC DTV standard will do more to drive interoperability of television and computer media -- both domestically and internationally -- than any standard now in existence.

^{21/} See, Intel Comments at Footnote 2.

^{22/} See, Information Technology Industry Council Comments at 1

^{23/} See, Schreiber Comments at 2

^{24/} See, CICATS Comments at 19-25, 27.

As Philips' stated in its initial comments, due in large part to the involvement of the computer industry in its development,^{25/} the ATSC DTV standard's interoperability features far exceed those of any other DTV standard currently available. Indeed, its support of multiple picture formats and frame rates -- *with a heavy reliance on progressive scan and square pixels*; all-digital layered architecture; packetized data transport structure; use of headers and descriptors give it unparalleled interoperability with computers. CICATS effectively concedes this proposition by agreeing that of the five major components of the ATSC DTV standard, only one, the video formats, poses a problem from CICATS' perspective.^{26/} Notwithstanding the fact that 14 of 18 video formats in the ATSC DTV standard are progressive scan, CICATS opposes the formats because 3 SDTV formats and 1 HDTV format employ interlaced scanning.

CICATS' absolutist position is untenable and obstructionist. It is based on the assumption that all considerations other than perfect computer compatibility should be set aside in adopting the standard. It would be both bad public policy and unlawful for the Commission to rewrite the rules of this proceeding in such a fundamental way nearly ten years after its commencement. While computer interoperability is a factor to be considered, it is not dispositive nor anywhere near the most important consideration. Again, the purpose of the proceeding is to establish a broadcast transmission and not a computer display standard. It must be emphasized that the ATSC DTV standard is a *transmission standard*, not a *display standard*. As expressed particularly well by Sony:

It appears to be forgotten that the standard under review is a transmission standard, and as such, is quite different from a display signal format standard. Critics seem not to realize the crucial point that in an all-digital system the need for close technical coordination among initial program production, program transmission, and final program display standards is not as great as in analog. Progressive or interlaced scanning can be deployed within any of these segments of the total television system -- and digital techniques are today readily available that allow appropriate conversions between them. This decoupling contributes significantly to the flexibility of the ATSC DTV standard. Simplistic doomsday conclusions, therefore, that a preliminary

^{25/} Philips wishes to reference the initial comments filed by the Advanced Television Systems Committee (at Footnote 9), which provide an excellent chronicle of the extensive involvement of the computer industry throughout the ACATS process.

^{26/} See, CICATS Comments, Vol. I at 16-17.

interlaced transmission implementation will permanently obviate a future incorporation [of progressive scan] have no technical basis whatever...^{27/}

Simply because a broadcaster elects to transmit some material, such as sports, in interlaced format, does not mean that the receiver must display it in interlaced format. Philips, Thomson and other receiver manufacturers have repeatedly stated that they will make receivers capable of receiving and displaying any format that is transmitted and specifically that they intend to manufacture progressive scan display receivers. Thus, to the extent CICATS is troubled about the inferiority of interlaced display of text and graphics, that should be a non-issue because interlaced transmissions can be displayed in progressive scan by means of a decoder or "de-interlacer."

Proof of this capability apparently has been provided in a recent demonstration for several FCC Commissioners and staff. It is reported that IBM has developed and demonstrated a breakthrough integrated circuit that will perform conversions of material transmitted in interlaced format into multiple progressive scan display video formats at low cost.^{28/} Such a chip debunks CICATS' claims that the 4 interlaced scan formats supported by the ATSC DTV Standard preclude eventual migration to an all progressive scan transmission standard.

Opponents of inclusion of any interlaced format in the video formats also profess to be concerned that it will lead to a de facto all-interlaced transmission environment. Again, the facts belie the fear. The ABC broadcast network already has publicly announced its intention to move into the digital era concentrating on progressive scan format transmission. Given the growing numbers of joint ventures between broadcasters and computer companies, it is likely that ABC will be far from alone in transmitting in progressive scan. Thus, even at the outset of the transition to digital television, it appears that broadcasters will make substantial use of progressive scan format transmission.

CICATS' obsession with eliminating every interlaced transmission format also is totally inconsistent with one of its members' (Apple) open support for the DVB digital

^{27/} See, Sony Comments at 14.

^{28/} Chris McConnell, *Administration Efforts Produce No ATV Concensus*, BROADCASTING & CABLE, Aug. 12, 1996, at 16.

standards in Europe.^{29/} DVB is a less capable, European digital television transmission standard than ATSC DTV which is being marketed aggressively worldwide and which features exclusively interlaced format transmission. Apple's support for DVB and the other CICATS' members failure to oppose the all-interlaced DVB standard around the world completely undermines the credibility of their opposition to the few interlaced formats in the predominantly progressive scan ATSC DTV standard

The only remaining plausible explanation for CICATS' vigorous opposition to inclusion of these few interlaced formats, especially the "true" HDTV 1080 vertical line format, in the ATSC DTV standard is that this interlaced format creates the richest viewing experience for certain material, especially sports. The CICATS members know that the unprecedentedly magnificent presentation of sports in 1080 interlaced format will be one of the major selling points for HDTV to the American public. If CICATS members can deny broadcasters the ability to transmit in true HDTV, they improve their own competitive position at the expense of broadcasters and the viewing public. This explanation also accounts for CICATS' apparent acquiescence in the DVB standard since it does not really have the robustness to provide true HDTV. In other words, the more capable ATSC DTV standard is a genuine competitive threat to CICATS members; DVB is not.

Viewed from this perspective, CICATS' opposition to inclusion of 4 interlaced formats in the ATSC DTV transmission standard has far less to do with computer interoperability than with competitive positioning. It boils down to a criticism that the ATSC DTV standard is *overly functional* and *overly flexible* for the very reason that it supports both interlaced *and* progressive scan formats rather than restricting the technology only to progressive scan. That is hardly a sustainable basis for rejecting the ATSC DTV standard

B. CICATS' Cost Analysis for DTV Receivers and Converters is Woefully Incorrect and Based Upon Flawed Methodology.

CICATS' argument that inclusion of interlaced transmission formats will bar convergence between the computer and the television also is undermined by the very presence of the CICATS cost analysis, which effectively concedes that there is no technical barrier to conversion of material transmitted in interlaced format into output displayed in progressive

^{29/} Apple is a signatory to the DVB MOU published in February 1996.

scan. CICATS, however, offers its cost analysis in an effort to demonstrate that costs of format conversion circuitry will make receivers prohibitively expensive.^{30/} Therefore, rather than a technological barrier, CICATS shifts ground to arguing that there will be a cost barrier to conversion. Once again, CICATS fails to sustain its burden of proof.

CICATS' cost assessment methodology, specifically its inappropriate use of the DSS receiver equipment as a cost model for the ATSC format converter, is so flawed as to border on the ridiculous. To make up for the fact that it lacks "precise engineering and design specifications" from which to build a cost model for DTV receiver and converter equipment, CICATS adopts instead the digital satellite system ("DSS") decoder as a proxy for the ATSC DTV system. CICATS claims that because the DSS decoder "receives a compressed digital signal from the satellite, decodes the signal and converts it into analog NTSC suitable for display on a conventional NTSC receiver or monitor... the current price of a DSS receiver provides a real-world starting point for [its] cost model."^{31/}

Unlike virtually any other seriously considered cost analysis -- wherein a product's costs are assessed through a component-by-component build-out -- CICATS begins its analysis with a *retail priced* DSS receiver, without ever breaking out any of the costs of the device's component parts or evaluating whether each of these parts actually would be included in a DTV receiver. This approach dooms its analysis from the start. For example, CICATS carelessly includes several DSS components that are entirely unnecessary to a DTV receiver, specifically its antenna and low-noise block converter. The inclusion of these components alone erroneously adds an additional \$100 in cost to the CICATS analysis, destroying its credibility.

Similarly, the incredibly inflated figures used by CICATS to reflect the cost burden on consumers from adoption of the ATSC DTV standard rest upon surreal projections of market penetration. They postulate a complete conversion of the entire NTSC receiver installed base by the year 2007, coupled with an overall increase of more than 130 million receivers/converters over the current installed base by 2007.^{32/} Even if the Commission were

^{30/} See, CICATS Comments at 37-41, Exhibit C at 1; Exhibit D at 4-6.

^{31/} See, CICATS Comments, Exhibit C at 1.

^{32/} See, CICATS Comments, Exhibit D, Tables 1-3.

to adopt both the ATSC DTV standard and the table of allotments and assignments in the fall of 1996, the earliest any broadcasters would be transmitting DTV other than on an experimental basis likely would be late 1998. Similarly, late 1998 likely would be the earliest time any commercially cognizable quantity of DTV receivers would enter the market. Yet, the CICATS cost analysis shows a ten percent conversion or market penetration rate for DTV in 1998, or more than 23 million sets converted. By contrast, DSS, the fastest penetrating consumer electronics item in history to date, including the VCR, is approaching the 2 million mark after being commercially available for almost 2 years. Market penetration rates exceeding 10 percent of the current installed NTSC base in year 1 of DTV commercial availability is orders of magnitude greater than any projection based upon historical, empirical data. Although Philips and other aspiring DTV receiver manufacturers dream that the CICATS projections prove true, they are in fact completely unrealistic.

In marked contrast to the flawed methodology employed by CICATS in the cost analysis included in its Comments, the Grand Alliance has developed a detailed and fact based analysis, drawing upon the great depth of experience its member companies have in the design and manufacture of receivers and converters. Philips references and endorses the analysis included as Appendix A to the Reply Comments of the Digital HDTV Grand Alliance for a detailed cost analysis of receivers and decoders using the ATSC DTV and CICATS Standard. In point of fact, the costs of receivers will be *lower* using the ATSC DTV standard, both for more low-end SDTV displays and for higher-end HDTV displays, than they would under the hypothetical CICATS proposal.

The Grand Alliance cost analysis yields the following comparison between ATSC-ready sets and CICATS-ready sets, with dollar figures representing manufacturing costs of the receiver, omitting the costs of the glass tube and the cabinet. In 1996:

An ATSC 480-line, interlaced display receiver would cost	\$184
An ATSC 480-line, progressive display receiver would cost	\$272
An ATSC 1080-line, interlaced display receiver would cost	\$311
An ATSC 720-line, progressive display receiver would cost	\$365
A CICATS 480-line, progressive display receiver would cost	\$224
A CICATS 720-line, progressive display receiver would cost	\$458

In summary, the Grand Alliance cost analysis reveals that, in 1996: (1) the use of an interlaced display provides the lowest cost ATSC-based receiver for both SDTV- and HDTV-quality display; (2) the CICATS single-format SDTV receiver is only \$48 less than the ATSC SDTV receiver, which decodes *all* of the ATSC formats; and (3) the CICATS 720-line progressive scan receiver costs nearly \$100 *more* than the ATSC HDTV progressive scan receiver *and nearly \$150 more than the ATSC HDTV interlaced receiver*. Moreover, when Moore's Law is applied, the \$48 difference in the progressive SDTV receiver in 1996 would fall to: \$24 in 1998, when early DTV stations first go on the air; \$6 by 2002, when all commercial stations would be on the air; and, ultimately, \$3 by 2004, when DTV equipment is expected to begin to reach substantial penetration levels.

Quite contrary to the scenario painted by CICATS, the Grand Alliance analysis demonstrates that, even in 1996, ATSC-compatible receivers would be either less expensive than the CICATS-based receivers (thanks to the use of interlaced scan display), or, in the case of progressive scan sets, very close in cost to the CICATS-based equipment. Using Moore's Law, by 2002, when most consumers would begin to enter the market for a DTV set, the cost differential between ATSC- and CICATS-based progressive scan sets drops to only \$6. However, most important to remember is that for that extra \$6 dollars in manufacturing costs, consumers will have fully functional DTV sets, capable of decoding *all* DTV programming, regardless of the broadcaster's preferred transmission mode. Under the CICATS model, however, for a mere \$6 cost savings, consumers would be stuck with equipment incapable of receiving true HDTV; if those consumers ever wished to receive true HDTV programming, they would be required to purchase a *second*, HDTV-compatible receiver or a converter in order to enjoy what they otherwise could have received using the comparably priced ATSC equipment. This is precisely the scenario that consumers fear and that must be avoided.

C. The Presence of Interlaced Scanning Formats Enhances the Value of the ATSC DTV Standard Both to Broadcasters and Consumers.

Despite claims to the contrary by CICATS and its supporters, the 4 interlaced scan formats that are supported by the ATSC DTV standard (3 in the SDTV mode and 1 in the HDTV mode) enhance the ATSC DTV standard's interoperability with various interlaced-driven media, endow the proposed standard with an even greater degree of flexibility, and,

as noted by the broadcasters (the primary users of this standard), add significant value to the standard.^{33/}

As stated by the ATSC, "[i]gnoring the benefits that interlaced scanning can provide for many types of traditional television programming would unduly limit applications of proven importance to broadcasters and viewers."^{34/} In fact, the presence of these interlaced scan formats will accomplish several important pro-consumer, pro-competitive objectives, including: guaranteeing consumers the highest quality digital television service available and maximizing efficient use of spectrum.

First, many, including Philips, believe that interlaced technologies currently are superior for certain non-film based applications, particularly sports and other fast-action programming. Indeed, in the competitive phase of the ACATS process, Philips and its ATSC partners pursued the development of an all-digital HDTV system using interlaced scanning format, in part because it alone supports 1,000 lines of picture resolution at 60 Hz while still fitting in the 6 Mhz channel. Broadcasters concur with this view, stating in their comments, "[w]here 1000 lines or more are required, interlaced scan would currently be the method of choice under the [ATSC] DTV standard."^{35/} Certainly when progressive scan technology advances to the point where it can provide comparable picture quality to interlaced scan under these conditions, Philips would support a migration to full progressive scan. At present, however, it is simply impossible to predict when the technology will progress to that point. In part, the speed with which all progressive scan formats can be obtained is contingent on the investment of money and resources the CICATS companies are prepared to make to expedite this migration. In the interim, Philips firmly believes that the public interest would not be served if the government were to *deny* consumers what is arguably one of the most valuable features of DTV technology while waiting for an alternative, all progressive-based technology to someday emerge. In fact, such an attempt to hold back technology from the public -- except to protect public safety -- would be unprecedented and would spark howls of protest from American consumers.

^{33/} See, Broadcasters' Comments at 10-11.

^{34/} See, ATSC Comments at 22.

^{35/} See, Broadcasters' Comments at 10.

Second, as noted by ATSC, "in the case of SDTV, where the objective [of broadcasters] may be to transmit multiple programs simultaneously over a 6 MHz channel, for non-film based video, the use of interlaced scanning will generally permit more simultaneous programs to be carried than if progressive scanning is used."^{36/} The option of an interlaced scan format thus not only provides viewers with potentially significant increases in programming choices, but also fulfills the Commission's goal of maximizing efficient use of spectrum. Moreover, the ATSC DTV standard's inclusion of interlaced scan formats, particularly in its standard definition (SDTV) mode, enables greater compatibility with alternative video delivery systems such as cable, DBS and wireless cable services, all of which are exclusively interlaced scan-driven. Finally, the ATSC DTV standard's compliance with MPEG-2 international compression and transport standards makes the standard fully interoperable with worldwide standards.

D. The CICATS Base-line Proposal Is Not A Serious Alternative to the ATSC DTV Standard.

Perhaps most extraordinary is CICATS' entreaty to the Commission that it cast away the ATSC DTV Standard, world-leading technology that is capable of delivering the very highest quality DTV services to American consumers right now, and disregard the 10 years and one half billion dollars in private investment that have gone into its research and testing, in favor of a purely theoretical alternative, the CICATS base-line proposal, which has not even left the drawing board, much less having been thoroughly tested. The Reply Comments of the Grand Alliance and the ATSC detail the failings of the CICATS base-line proposal and are supported by Philips.

The lack of interoperability of the CICATS proposal warrants elaboration. The CICATS proposal is actually less interoperable than the ATSC DTV standard in several key ways. First, its failure to include even a single interlaced format renders it far less interoperable with cable TV systems, as well as with DBS, wireless cable, and open video systems that are interlaced-driven. Second, the CICATS single base-line standard, so far as its proponents have sketched it out, is not MPEG-2 compliant^{37/} This is a fatal flaw.

^{36/} See, ATSC Comments at 22

^{37/} The CICATS proposal's 36 and 72 Hz frame rates are but two of many violations of MPEG-2, as shown in detail in an appendix to the Reply Comments filed by the ATSC in this proceeding.

Without MPEG compliance, the CICATS proposal is dead on arrival the moment it crosses the U.S. border. Whereas the Fifth NPRM asks if "*additional* measures [should be pursued] to facilitate international compatibility..."^{38/} (specifically citing the ATSC DTV standard's adoption of MPEG-2 compression technology), CICATS proposes the adoption of a system that would severely impair such worldwide interoperability and effectively deny foreign markets for U.S. technology and equipment exports. By contrast, the ATSC DTV standard is fully MPEG-2 compliant and was designed as such specifically to ensure maximum compatibility with international standards and to create and expand global markets for U.S. DTV products and technologies. In fact, so lacking in real science is the CICATS proposal, the objective observer is left only to conclude that it is a mere ploy by which CICATS seeks to defer endlessly the introduction of DTV until the technology needed to create a viable all-progressive scan standard offering video quality comparable to 1080 interlaced does exist. Meanwhile, consumers would be denied the benefits of the best available digital television technology in the world and broadcasters would be left at an unacceptable competitive disadvantage vis-a-vis other video delivery systems, several of which already employ digital technology. That is simply an unacceptable result for a nearly 10 year process to establish a digital broadcast transmission standard.

Consideration of the CICATS single base layer proposal simply cannot be part of any serious effort to adopt a DTV standard, particularly one that seeks to maximize interoperability. Even without the results of a *bona fide* test regimen (such as that which has proven the exceptional merits of the ATSC Standard), the CICATS proposal fails to pass even a naked eyeball test. If the Commission is truly committed to blazing a path to convergence among various media through the introduction of DTV, it must recognize that no other standard, either tangible (like DVB) or abstract (like the CICATS proposal) is capable of achieving as high a level of interoperability as the ATSC DTV standard.

E. Opponents of the ATSC DTV Standard's 16:9 Aspect Ratio Fail to Make Their Case.

Philips strongly supports the ATSC DTV standard's adoption of the 16:9 aspect ratio, and is pleased to note that a broad consensus of groups, including the Motion Picture Association of America ("MPAA") and the broadcasters support this view. The decision to

^{38/} See, Fifth NPRM at ¶68 (emphasis added).