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Federal Communications Commission
Office of the Secretary

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

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| In the Matter of | ) | |
| | ) | |
| Advanced Television Systems and Their Impact on the Existing Television Broadcast Service | ) | MM Docket No. 87-268 |
| | ) | RM-5811 |
| Review of Technical and Operational Requirements: Part 73-E, Television Broadcast Stations | ) | |
| Reevaluation of the UHF Television Channel and Distance Separation Requirements of Part 73 of the Commission's Rules | ) | |

# REPLY COMMENTS OF NORTH AMERICAN PHILIPS CORPORATION

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January 23, 1989

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## SUMMARY

The first-round comments reflect growing consensus on many key issues concerning the advent of advanced television. The Commission should continue its efforts to provide policy guidance, even as technology development and comparative evaluation programs proceed. The tentative decisions set forth in the Further Notice should be finalized, and additional findings as set forth in our initial comments should be put out for public comment.

It is neither necessary nor appropriate for the Commission itself to evaluate proponent ATV systems at this time. The Advisory Committee should continue to gather and sift detailed information and commence comparative testing, while the Commission provides guidance on those matter which cannot await the conclusion of the Advisory Committee process. Among such matters are the importance of broadcaster participation in HDTV (not just some lesser form of ATV), the need for intermedia compatibility and interoperability, the need to continue service to NTSC receivers, and the impracticality and undesireability of prescribing mandatory requirements for television receivers. The Commission should express its intention ultimately to select a single standard for terrestrial HDTV broadcasting and its awareness of the reasons which the standard selected should

also be suitable for use by cable and easily transcoded for transmission via satellites.

Spectrum, standards, and other issues are closely related, and we neither seek nor expect any final spectrum decisions at this time. It is our view, however, that consideration of all relevant factors will demonstrate the superiority of a "half-channel" augmentation approach (6 + 3 MHz) over other approaches to the terrestrial distribution of HDTV programming. We do not think it premature to suggest that the Commission begin to favor this approach.

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REPLY COMMENTS OF
NORTH AMERICAN PHILIPS CORPORATION

North American Philips Corporation (NA Philips) hereby replies to the comments submitted in response to the Commission's Tentative Decision and Further Notice of Inquiry (Further Notice).[1]

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1/ FCC 88-288 (released Sept. 1, 1988) [hereinafter cited as "Further Notice"]. For simplicity's sake, all parties cited herein and the abbreviations used in referring to these parties are listed just after the signature page. Except as specifically noted, all comments cited are first-round responses to the Further Notice and were filed with the Commission on approximately November 30, 1988.

## I. NA PHILIPS WELCOMES THE SUBSTANTIAL SUPPORT THAT HAS BEEN EXPRESSED FOR POSITIONS WE HAVE LONG ESPOUSED.

The comments submitted in response to the Further Notice confirm that much work must be done before the Commission can properly select an advanced television (ATV) system for use by terrestrial broadcasters. The comments also demonstrate that many of the related public policy issues also require additional time to ripen. Nonetheless, tangible progress in policy development is evident from the emerging consensus on many key issues. NA Philips is gratified that the first-round comments reflect strong support for several fundamental propositions that have guided us in our technology development efforts and in our participation in the policy arena.

At this point, there is virtually complete agreement that ATV is in the public interest and that the Commission should press forward with the development of public policies to facilitate the deployment of ATV.[2] There is also widespread accord that terrestrial broadcasters must have an opportunity to participate in ATV to remain

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2/ E.g. NCTA Comments at 2; Sony Comments at 1-4; Thomson Comments at 4-5.

competitive;[3] this, in NA Philips' view, requires that broadcasters offer nothing less than high definition television, with all that the term has come to encompass.[4] Insofar as NA Philips is able to determine, there has been absolutely no dissent to the Commission's tentative conclusion that existing service to viewers utilizing NTSC receivers must be continued[5] (though a few parties seem to have assumed, without explaining any basis for this belief, that the need for such service will cease at some time in the intermediate future).[6]

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3/ E.g. Joint Broadcasters Comments at 1-5; NAB Comments at 20; NBC Comments at 2; PBS/NAPTS Comments at 3.

4/ NA Philips continues to believe that, to avoid new compatibility constraints, to avoid marketplace confusion and consumer anxiety, and to conserve scarce development resources, the terrestrial introduction of HDTV must be a one-step process. Accord CBS Comments at 35 n.*. The availability of a prospectively long-lived HDTV standard would enable receiver manufacturers to offer a family of television sets spanning a broad range of price points (from basic NTSC to top-of-the-line HDTV) which would invite the earliest and the broadest public participation in ATV.

5/ E.g. Joint Broadcasters Comments at 1-5; NAB Comments at 1-5; PBS/NAPTS Comments at 3.

6/ For the reasons given in our initial comments, we expect that NTSC will be needed -- and will be used -- for quite some time to come. If a simulcast approach is adopted and NTSC does not disappear, a very inefficient use of spectrum will result.

To those who contend that the Commission must not "enshrine forever the inefficiencies of NTSC," we note

(Footnote 6 continued on next page)

Virtually every party filing first-round comments agrees that the Commission should (at the appropriate time) prescribe a single, mandatory standard for terrestrial ATV broadcasting rather than rely on "marketplace" forces to address the standards issue.[7] A sizable majority of the parties which address the issue recognize the need for intermedia compatibility and interoperability, thus highlighting the need for the terrestrial ATV broadcasting standard to have video baseband parameters suitable for use by other video delivery media, such as cable and satellite.[8] Most parties agree that "open architecture receivers" are

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(Footnote 6 continued from previous page)
only that (1) NTSC has already demonstrated the flexibility necessary to introduce color and stereo sound and can accommodate additional improvements now, (2) the marketplace will demand that NTSC service be continued for the foreseeable future, and (3) the Commission cannot hope at this point in time to make decisions that will last forever (broadcasting may become completely digital at some point in time; broadcasting may be completely replaced by other delivery media). Based on current circumstances and the needs of the reasonably foreseeable future, it seems clear that NTSC can and should serve as the foundation for high-performance, spectrum-efficient HDTV.

7/ E.g. ABC Comments at 6; Joint Broadcasters Comments at 13-16; CBS Comments at 33-36; Group W Comments at 3; NAB Comments at 12-14; Sarnoff Comments at 22-24; Thomson Comments at 13-14.

8/ E.g. Joint Broadcasters Comments at 17-20; CBS Comments at 41-42; CPB/NAPTS Comments at 41-44; NCTA Comments at 8-10; Time Comments at 5-7.

not, for a variety of reasons, an acceptable alternative to the adoption of a standard; among those who best understand the problems inherent in such an approach, i.e., the receiver manufacturers, this view is unanimous.[9]

Another area of consensus involves the pace of Commission deliberations. There is broad support for the Commission's continuing its active review of ATV issues, but at the same time virtually everyone agrees that the time is not yet ripe for the Commission to contemplate selecting a standard, changing broadcast interference protection rules, finalizing spectrum decisions, addressing allotment criteria, or considering the allocation of broadcast spectrum for non-broadcast uses.[10] Final decisions on such issues must await additional progress in ATV system proponents' laboratories, additional study by the Advisory Committee on Advanced Television, and testing by the Advanced Television Test Center and the Cable Labs.

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9/ E.g. ABC Comments at 6-7; CBS Comments at 38-39; NAB Comments at 14-16; NCTA Comments at 14; Sarnoff Comments at 22-25; Thomson Comments at 15; Zenith Comments at 33-35. Even the most zealous proponent of "open architecture" says that "OAR is not an excuse for failure to set standards." Schreiber Comments at 20.

10/ E.g. ABC Comments at 7; CBS Comments at 7, 48-49; CPB/NAPTS Comments at 33-37; NAB Comments at 3-12, 19-23; PBS/NAPTS COmments at 5-10.

On many of these issues, there is little more that must be said at this time in this forum.[11] Other issues, discussed below, do warrant further amplification at this time.

## II. THE ADVISORY COMMITTEE IS THE APPROPRIATE FORUM FOR THE TESTING AND EVALUATION NECESSARY TO DEVELOP THE DETAILED FACTUAL RECORD NEEDED FOR THE COMMISSION TO CHOOSE A STANDARD.

A review of the first-round comments suggests that it may be helpful for the Commission to clarify the nature and objectives of this proceeding, MM Docket No. 87-268, as contrasted with the role and responsibilities of the Commission's Advisory Committee on Advanced Television Service. Although one or two system proponents devoted much of their comments to extolling the virtues of their systems, NA Philips believes that these "sales pitches" would be more appropriately addressed to the Advisory Committee rather than the Commission at this stage of the process. It is clearly premature for the Commission to select a system. It is not premature for the Commission to begin to focus on

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11/ NA Philips does not regard it as necessary to express its views on each issue on every occasion. We have taken positions on many of the issues raised by other parties, and we stand by those positions but do not repeat all of them here.

certain policy issues which affect the efforts of ATV system developers and of the Advisory Committee.[12]

As NA Philips sees it, the primary purpose of the initial Notice of Inquiry and of the Further Notice is to assist the Commission in identifying the principal "technical, economic, legal, and policy issues" associated with ATV.[13] To the extent that the information provided to the Commission establishes a basis on which the Commission can confidently formulate policy decisions, such decisions will be useful to system developers and to the Advisory Committee in their continued efforts. At present, however, the Advisory Committee is the proper forum for the compilation and analysis of the detailed factual information that will

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12/ In early-filed reply comments, Zenith criticizes us for "overzealous[ness]," claiming that we have proposed decisions "the sum of which would eliminate virtually every other contending system." Zenith Reply Comments at 3 (Jan. 6, 1989). Zenith fails to understand that we merely advocated the adoption of tentative decisions that would be the subject of further consideration and public comment, which is completely consistent with the Commission's effort to narrow the issues in dispute. It also bears emphasis that, rather than having tailored our public policy recommendations to the virtues of HDS-NA, we have instead designed HDS-NA to meet the needs of and work within the constraints dictated by public policy considerations.

13/ See Advanced Television Systems and Their Impact on the Existing Television Broadcast Service, Notice of Inquiry, 2 FCC Rcd 5125, 5125-26 (¶ 3); Further Notice, at ¶ 1.

be necessary before the Commission can consider selecting a particular ATV system -- or even making final decisions on spectrum or allotment issues.[14] And it is the Advisory Committee (particularly the Systems Subcommittee)[15] which is the primary forum in which the competing claims of systems proponents must be assessed. Accordingly, NA Philips intends to continue to focus primarily on broad policy issues in its submissions before the Commission, while cooperating in evaluation and testing of HDS-NA by the Advisory Committee and other organizations.

Before any ATV system is selected for use by terrestrial broadcasters, a great deal of testing and evaluation will be necessary. This will be a time-consuming process, especially in light of the development status of most of the candidate systems. NA Philips plans to participate in all test programs administered by the Systems

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14/ The Commission established the Advisory Committee to render advice on "facts and circumstances" associated with ATV and to "assemble [and] analyze information, deliberate upon . . . policies and actions, and develop recommendations" for consideration by the Commission. See FCC Public Notice, "Formation of Advisory Committee on Advanced Television Service," 52 Fed. Reg. 38,523 (Oct. 16, 1987).

15/ The Systems Subcommittee is charged with evaluating and recommending ATV systems and advising on technical standards and spectrum requirements. FCC Notice, supra note 14.

Subcommittee, the Advanced Television Test Center, and the Cable Labs. Such testing is an essential element of system development. No system can be developed without testing of hardware under "real world" conditions; conversely, no system proponent can credibly propose a system which has not been publicly tested.

Demonstrations are also important to evaluation of candidate systems. Again, NA Philips plans to participate fully. The first generation HDS-NA terrestrial hardware was demonstrated over a hardware simulated cable system in March 1988. In December 1988, we demonstrated the baseband performance of our second-generation HDS-NA satellite system. This year, we plan several additional field-tests and demonstrations of HDS-NA -- including terrestrial broadcast, cable, and satellite distribution -- as the development effort progresses. Such processes will ensure that the Commission has the information necessary to select a system at the appropriate time.

## III. A "HALF-CHANNEL" AUGMENTATION APPROACH (6+3 MHz) STRIKES THE PROPER BALANCE BETWEEN THE NEED FOR HDTV QUALITY AND THE LIMITATIONS OF AVAILABLE SPECTRUM.

A number of commenters have indicated that the Commission should make no decisions on spectrum, the type of

system (enhanced, augmentation, or simulcast) to be chosen, or the particular system to be chosen, prior to testing.[16] Those who take this view observe that tradeoffs must be made among cost, spectrum efficiency, and the quality of the delivered picture.[17] NA Philips agrees that the various ATV system proposals involve different tradeoffs of various factors, including spectrum requirements. As noted in Part II of these Reply Comments, specifics of particular proponent systems must be evaluated through testing. However, NA Philips believes that there are valid bases on which to make at least a tentative decision (subject to further evaluation and comments) concerning the amount of spectrum to be used and the type of system to be adopted. NA Philips believes that a "half-channel" augmentation approach (using 6 MHz for the NTSC channel and 3 MHz for the augmentation information) provides the optimal solution for terrestrial broadcasting of ATV. The system can support HDTV resolution, artifact-free rendition of motion, compact disc quality audio, pan-and-scan, and wide aspect ratio in a spectrum-efficient manner and at an acceptable cost to consumers and broadcasters alike.

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16/ E.g., Zenith Comments at 28; Thomson Comments at 9-12.

17/ E.g., CBS Comments at 9-15; see also Further Notice at ¶¶ 40, 42.

Although several commenters have expressed a preference for a single channel (6 MHz) ATV system,[18] other parties have recognized that an NTSC-compatible signal carried in one 6 MHz channel does not provide sufficient information for picture and sound quality competitive with that which is virtually certain to be available from other media.[19] Several parties have also noted that the spectrum required for full channel augmentation (6+6 MHz) or simulcast approaches (two 6 MHz channels) will make it very difficult, if not impossible, to provide sufficient spectrum for all licensees who might wish to broadcast HDTV.[20]

To be sure, there has been some speculation that augmentation systems will have problems with propagation characteristics, ghosting, and cable robustness, and that they will perpetuate inefficiencies of NTSC.[21] NA Philips is confident that all these concerns can be resolved by a

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18/ E.g. NCTA Comments at 19-20; Group W Comments at 5; ABC Comments at 5; Time Comments at 17-19; Hughes Comments at 4.

19/ E.g. Sarnoff Comments at 8; Time Comments at 18; Group W Comments at 5.

20/ E.g. CBS Comments at 14; Sarnoff Comments at 11-12.

21/ E.g., Sarnoff Comments at 9-10; CBS Comments at 13-15; Time Comments at 21; Schreiber Comments at 8.

proper design.[22] NA Philips intends to continue system demonstrations and testing to prove that this confidence is justified.

## IV. ISSUES OF TABOOS, INTERFERENCE, AND ALTERNATE MEDIA SHOULD BE SOLVED ON THEIR OWN MERITS, NOT BY IMPOSING OVERLY COMPLEX AND COSTLY REQUIREMENTS ON RECEIVER DESIGN.

Several parties urge the Commission to regulate details of the television receiver (e.g., architecture, signal processing approach, display format, technology to be used).[23] NA Philips strongly opposes such proposals for a variety of reasons. We summarize them here, but also wish to advise the Commission that a planned EIA technical committee on ATV receivers will conduct a more detailed study of these issues.

Consumer electronics is a highly competitive cost- and market-driven industry. Manufacturers strive to provide the consumer with a range of products and features at the lowest possible cost while maintaining an appropriate level

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22/ See NCTA Comments at 20. Similarly, our own tests have shown the cable signals to be robust and we have achieved transparency in the stitching of the side panels.

23/ E.g. Schreiber Comments, passim; Group W Comments at 4; PBS/NAPTS Comments at 29-31 (but prefers FCC prescription of transmission standard); Hughes Comments at 8-10.

of performance. Historically, even as technological innovations were implemented and the perceived quality improved, relative prices have declined.

Each product is a direct response to changing technology, market structure, and consumer demand. The ability to respond rapidly to these changes is essential to the success and survival of the industry. Imposing mandatory standards on receivers would hinder the industry from meeting new challenges, make the industry less competitive, and result in an overall disadvantage for the economy and the consumers. The better approach is for the Commission to establish the transmission standard, which will serve as the foundation from which other implementation decisions (e.g., for receiver design) can be made on a marketplace rather than regulatory basis.[24]

One example of a successful market driven innovation is the IS-15 multiport for NTSC receivers. NA Philips

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24/ As the Commission is well aware, it has much greater authority -- and expertise -- with respect to broadcast transmission than with respect to TV receivers. No one but the Commission can regulate spectrum or establish transmission standards. With appropriate FCC decisions on transmission issues, receiver manufacturers have demonstrated their ability to integrate new features (e.g., color, stereo) while lowering costs. Additional regulation of receiver manufacturers is not needed and would inevitably interfere with continued innovation and cost-cutting.

is actively involved in standard setting and application for the multiport, and support will extend to adaptation for ATV when the time comes. NA Philips regards the ATV multiport as a sensible interface point for alternate media video. Provided when and to the extent required by the market, it would allow for flexible end-user access to the RF and base-band video input/output parts of the receiver. Nevertheless, a mandatory multiport (and standard) for all receiving sets would burden many consumers with something they do not want (yet) and cannot use. The final choice -- the freedom to select the right mix of price, features, and performance -- should remain the right of the consumer.

Another problem area is the use of taboo-channels for HDTV. Right now, the optimum place for the ATV augmentation channel within the presently allocated VHF/UHF spectrum appears to be in the taboo channels.[25] Studies have shown that the free use of these channels for an NTSC type signal is not currently feasible.[26] The augmentation signals have to be designed to operate in the taboo channels without interfering with present and future NTSC receivers,

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25/ Further Notice at ¶¶ 75-81.

26/ OET Technical Memorandum, "Analyses of UHF Receiver Interference Immunities Concerning Advanced Television" FCC/OET TM 88-2.

and the augmentation signals must be robust enough to withstand interference from conventional NTSC signals.

To protect the existing (and future) NTSC receiver population, NA Philips believes that it is essential to choose a "good" design for the ATV augmentation signal which will not cause interference into NTSC receivers. Choosing a proper augmentation signal will reduce the overall cost burdens that would be borne by broadcasters, receiver manufacturers, and consumers. By contrast, trying to improve receiver/tuner immunity to interference would come with a hefty price tag for the consumer, but with no visible benefit such as improved picture quality or desired features. Furthermore, a 10-15 year delay has to be expected before use of the improved sets would be sufficiently widespread to regard them as "standard;" more than half of all receivers sold this year will still be in use at the turn of the century.[27]

With digital augmentation, transmitter power can be reduced, distinct carrier interference patterns can be avoided, and the signal will remain rugged against interference from NTSC and other augmentation channels.

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27/ As noted in our initial comments, one consumer survey showed that a majority of TV receivers are used for more than 15 years. NA Philips Comments at 16 n.9 & accompanying text.

NA Philips believes that the digital augmentation approach can be implemented to operate successfully within the taboo channels.

In summary, the public interest would not be served by a Commission decision to regulate details of the receiver. Receiver manufacturers will develop products with continuous adaptation and optimization of features and cost, and the risk of implementing overly complex and costly over-designs will be avoided. The receiver cannot be regarded as a stand-alone unit by itself but must be viewed as part of the complete NTSC/ATV system.

Selecting an ATV signal that inherently allows the use of taboo-channels will not only protect the existing NTSC receiver population but also avoid the need for a costly and lengthy regulatory and implementation process concerning the interference performance of receivers. With ATV evolving via alternate media over the next years, any unnecessary delays will severely lower the success potential of terrestrial broadcast ATV.

## V. A SINGLE WORLDWIDE PRODUCTION STANDARD IS NOT LIKELY TO BE ADOPTED, AND U.S. DECISIONS ON THIS ISSUE SHOULD BE DRIVEN BY TRANSMISSION NEEDS.

Those supporting adoption of a worldwide production standard, in particular the 1125/60 standard, have

argued that choosing such a standard will benefit the U.S. production industry by enabling it to maintain its favorable balance of trade by easily exporting and co-producing programs throughout the world.[28] Whatever the merits of that argument,[29] events which need not be recounted have made realization of that goal highly improbable. A recent statement by the National Telecommunications and Information Administration puts it even more strongly: "it has become evident that a single, worldwide HDTV production standard will not be agreed upon."[30]

Although the Commission apparently does not intend to become directly involved in the consideration of a production standard,[31] NA Philips does wish to call the Commission's attention to a related matter which may affect the integrity of the Advisory Committee's comparative testing process. Working Party 6 of the Planning Subcommittee

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28/ HDTV 1125/60 Group Comments, passim; Sony Comments at 9-17.

29/ As one of the commenters has correctly noted, it is programming content, not production or interchange standards, that sells programs overseas. Schreiber Comments at 17.

30/ See NTIA Notice of Inquiry, "Inquiry on Production Standards for High Definition Television (HDTV)," Docket No. 81257-8257, 53 Fed. Reg. 51296, 51297 (Dec. 21, 1988).

31/ Further Notice at ¶ 21.

is considering the use of 1125/60/2:1 video signals as the designated source material for testing of all candidate ATV systems. NA Philips regards such an approach as utterly unacceptable. It would bias the test results against those systems, such as HDS-NA, which have been designed on the foundation of NTSC values.

NA Philips has forcefully communicated its views to PS/WP6.[32] We have urged that tests be conducted on the basis of 35 mm film, at 60 frames per second, and multi-standard cameras, which would avoid biasing the evaluation of candidate systems. We would hope that the Commission would monitor this matter carefully and intervene if necessary to ensure that tests are conducted fairly.

Later, after candidate systems have been tested, and a transmission standard has been established, it may be appropriate for the Commission to promote a domestic production standard. We believe such a standard should be consistent with the parameter values of the HDTV transmission signal, and not the other way around. NTSC-compatible HDTV for the U.S. necessitates identical baseband video parameters throughout the video transmission system and consumer

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32/ Letter from Mark M. Rochkind, President, Philips Laboratories, to Bronwen L. Jones, Chairperson, PS/WP6 (Jan. 6, 1989)(copy attached).

environment. Critical video parameters should be directly related to NTSC values (e.g., field rate and scan rate), so that NTSC can be easily derived from HDTV without picture degradation. Common baseband parameter values will provide simple interoperability among the media alternatives including satellite, terrestrial broadcast, cable, fiber optics, and VCR/disc. Quality pictures can then be made available for viewing by all U.S. consumers, irrespective of the distribution medium. These considerations lead us to endorse the 1050/59.94 standard proposed by NBC and supported by a number of other U.S. companies.

## VI. CONCLUSION

NA Philips continues to believe that the Commission should finalize the tentative decisions articulated in September 1988 and adopt additional findings as recommended in our comments of November 30. Progress in policy development can proceed even while technology development and comparative evaluation programs are underway.

We shall continue our efforts to be helpful to the Commission, the Advisory Committee, and other governmental and industry organizations in their consideration of ATV.

The ultimate results, we remain confident, can be enormously beneficial for electronics manufacturers, video delivery media, and -- most important -- consumers.

Respectfully submitted,

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January 23, 1989

## List of Parties Cited and Abbreviations Used

Association of Maximum Service Telecasters, National Association of Broadcasters, Association of Independent Television Stations and 70 other parties (Joint Broadcasters)

Capital Cities/ABC, Inc. (ABC)

CBS Inc. (CBS)

Corporation for Public Broadcasting/National Association of Public Television Stations (CPB/NAPTS)

HDTV 1125/60 Group

Hughes Communications, Inc. (Hughes)

National Association of Broadcasters (NAB)

National Cable Television Association (NCTA)

Public Broadcasting Service/National Association of Public Television Stations (PBS/NAPTS)

David Sarnoff Research Center, Inc. (Sarnoff)

William F. Schreiber (Schreiber)

Sony Corporation (Sony)

Thomson Consumer Electronics, Inc. (Thomson)

Time, Inc. (Time)

Westinghouse Broadcasting Company, Inc. (Group W)

Zenith Electronics Corporation (Zenith)