STATEMENT OF

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TO THE U.S. HOUSE OF REPRESENTATIVES

SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY

The Subcommittee on Science, Research, and Technology has asked what steps must be taken to ensure a major role for U.S. industry in high definition television (HDTV). I have been asked to testify because of my work with various technical societies, and because I am the Executive Director of the Advanced Television Systems Committee (ATSC). This statement represents my personal views and not necessarily the views of the members of the ATSC.

SUMMARY

I believe that voluntary standards, developed and widely supported by industry, are essential to maintain orderly and beneficial growth of technology. When it is appropriate to have mandatory standards adopted by the government, the industry must still play the most significant role in developing standards applicable to it. Even though decisions on standards are made in a political and commercial environment, the standards must have a solid technical basis or they will not endure.

My statement briefly describes the Advanced Television Systems Committee, a private sector organization formed in 1983

by the United States television industry to coordinate and develop voluntary national technical standards for advanced television systems. It then reviews the benefits of, and the need for, voluntary national technical standards. It concludes with a discussion of the government's role in the standards process, focusing primarily on the development of standards for HDTV.

I. THE ADVANCED TELEVISION SYSTEMS COMMITTEE

The ATSC was formed in 1983 as a private sector organization to develop and coordinate voluntary national technical standards for advanced television systems. The main impetus for the creation of the ATSC came from the five members of the Joint Committee for Intersociety Coordination, known as the JCIC.[1] Traditionally, the JCIC members had taken responsibility -- sometimes jointly, sometimes individually -- for the development of technical standards for radio and television systems. In 1983 they decided, after considerable debate, that advanced television standards should be developed by a single new organization, somewhat differently structured. The membership of the new organization would include not only JCIC members, but all other American companies and organizations having a direct, bona fide interest in advanced television standards.

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[1] The five JCIC members are the Electronic Industries Association, the Institute of Electrical and Electronics Engineers, the National Association of Broadcasters, the National Cable Television Association and the Society of Motion Picture and Television Engineers.

The JCIC believed that such an organization -- where standards development would be governed by the will of a super-majority instead of consensus, and with rules establishing membership criteria and requiring attendance at meetings in order to maintain voting eligibility -- would be necessary to avoid duplication of effort and to assure the timely development of a coordinated set of effective national standards. Another stated goal of the ATSC was to facilitate the development of a unified national position to guide the United States' delegations in the deliberations of international standards making bodies. Achievement of these objectives, it was felt, would be an essential factor in the United States' ability to foster a new generation of domestic television service.

The ATSC's Charter specifies several responsibilities for the organization:

... encourage participation by United States government agencies in the work of the ATSC;

... coordinate standards development;

... develop standards;

... submit proposed voluntary standards, when appropriate, to the Federal Communications Commission (FCC) and to the American National Standards Institute (ANSI).

... develop recommended positions for the United States' use in international standards organizations;

These responsibilities have been pursued from the beginning. The ATSC is recognized here and internationally as the preeminent standards organization in the United States in the field of advanced television systems. The ATSC represents all facets of

the television industry in the United States.[2] The organization is in place, actively carrying out its designated tasks.

Past Work of the ATSC

The work of the ATSC was assigned to three technical groups, one of which was the Technology Group on High Definition Television.[3] That group further subdivided into groups on production, transmission, reception, and display. Early in the life of the HDTV Technology Group, its members decided that HDTV production and HDTV transmission were separable matters and that HDTV production should be pursued before HDTV transmission. This decision was in line with earlier decisions by all the world's broadcasting unions and the Consultative Committee on International Radio (CCIR).[4]

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[2] ATSC members are terrestrial broadcasters, cable television organizations, telephone companies, professional and consumer electronics manufacturers, satellite companies, motion picture producers and universities.

[3] The roles of the ATSC Technology Groups are:

The Technology Group on Improved NTSC is addressing the ongoing and evolutionary improvements to the present NTSC system that involve no incompatible changes to the present radiated signal standards.

The Technology Group on Enhanced 525-Line Systems is considering improvements using 525 lines but not constrained by compatibility. Multiplexed analog component (MAC) systems are an example of enhanced systems.

The Technology Group on High Definition Television is considering voluntary national standards for high definition television systems. These systems are characterized by an improvement in both horizontal and vertical resolution of approximately 2 to 1, a wide aspect ratio of at least 5:3, and multiple-channel high fidelity sound.

[4] The CCIR is an international radio and television standards organization under the International Telecommunications Union (ITU), a permanent organ of the United Nations.

In 1985-1986 the HDTV Technology Group played a key role in forming the United States position at the CCIR on deliberations concerning a single worldwide HDTV studio standard. The 1125 line, 60 Hertz production standard -- which originated in the HDTV Technology Group and then was approved by the requisite two-thirds majority of the ATSC in a written ballot on January 6, 1988 -- became the first advanced television system standard to be adopted in the United States.

Future Work of the ATSC

Emphasis within the ATSC has now shifted from production to distribution -- the means by which programs will be delivered from the producer's studio to the viewer's home. The ATSC is closely following the development of various delivery systems for advanced television. Technical presentations have been given to ATSC technology groups by all system proponents. Ultimately, it is expected that a standard or standards will be developed for systems delivering programs by terrestrial broadcast, cable, satellite, video cassette recorder (VCR) and video disk.

ATSC members are actively participating in studies both inside and outside the ATSC. The ATSC, its staff and its members have participated in conferences and tutorials on advanced television systems here and abroad and are continuing to do so. ATSC members are actively participating in the work of the FCC's Advisory Committee on Advanced Television Service; indeed, all

three Subcommittee chairpersons and nine of fourteen Working Party chairpersons are representatives of ATSC member companies.

I believe that the ATSC, using the resources of outside organizations such as the recently created Advanced Television Test Center, is an essential part of the process needed to achieve national technical standards for advanced television systems.[5] The private sector can provide the funds for all interested parties not only to advocate their views but to have their views fairly considered in a one member-one vote procedure. Our use of a super-majority voting mechanism tends to assure adherence to high quality without sacrificing the need to achieve broad-based industry support.

II. THE BENEFITS OF AND PROCEDURES FOR DEVELOPING STANDARDS

The Benefits of Standards

The desirability of establishing technical standards to promote orderly technological growth and development is clearly demonstrated by Achsah Nesmith in his description of a situation that occurred when a fire broke out in Baltimore in 1904.[6] Within

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[5] The Advanced Television Test Center (ATTC) was formed to test advanced television systems in cooperation with the ATSC and the FCC's Advisory Committee. The founding members of the ATTC are the National Association of Broadcasters, the Association of Maximum Service Telecasters, the Association of Independent Television Stations, Capital Cities/ABC, CBS, NBC, and PBS.

[6] Achsah Nesmith, "A long, arduous march toward standardization," Smithsonian, Volume 15, Number 12, March 1985, p. 176.

10 minutes an explosion spread the fire to neighboring buildings. A telegram was sent to the Washington fire department asking for desperately needed help. The Washington firemen made the journey in a record 38 minutes, but, upon arrival, found that their fire hoses would not fit the nozzles on the Baltimore fire hydrants. Several other fire departments made the trip to Baltimore, but they, too, found that they could not use their hoses. Extensive damage was done by the 30 hour blaze. There was no shortage of water -- only a shortage of hoses that fit the nozzles.

Although technical standards for advanced television systems do not fall in the category of safety issues, standards in this field, as in most if not all other technology based industries, offer many benefits. Among those benefits are:

... compatibility of products supplied by different firms;
... lower costs due to economies of scale in production;
... higher product quality because of more users;
... future developments focused in a common direction;
... reduced chance of premature technological obsolescence;
... better availability and prices for associated goods;
... technology improvements as experience accumulates.

The value of standards is further treated in a report for the National Science Foundation by Stanley Besen and Leland Johnson of the Rand Corporation.[7] This report analyzes the forces that determine whether compatibility occurs in the broadcasting industry, the nature of standards that emerge, and the economic effects of these standards. The authors state, "Virtually all of

[7] Stanley M. Besen and Leland L. Johnson, Compatibility Standards, Competition, and Innovation in the Broadcasting Industry, prepared under a grant from the National Science Foundation, R-3453-NSF, November 1986.

the theoretical studies that we have examined illustrate the sources of benefits from standardization."[8]

The Procedures for Developing Standards

There seems to be no question regarding the need for standards for advanced television systems. There are, however, issues related to the mechanism for developing those standards. Besen and Johnson describe three processes:

> Noncooperative behavior -- The "marketplace approach" where firms adopt technologies independently. A "de facto" standard may or may not evolve.
>
> Cooperative behavior -- Interested parties meet to develop, recommend, and adopt voluntary industry standards.
>
> Government action -- Government agencies adopt mandatory industry standards.[9]

"Noncooperative behavior" can often lead to the development of equipment utilizing multiple, de facto standards that are incompatible with each other. Under such circumstances, a potential user contemplating a purchase must decide which technology to embrace -- will one technology succeed while another fails, rendering the purchased equipment obsolete? This technique can lead to chaos and confusion in the marketplace.

The belief underlying the formation of the ATSC is that the most appropriate first step for developing standards for advanced

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[8] Besen and Johnson, pp. 7-9.

[9] Besen and Johnson, pp. 1,2.

television is "cooperative behavior" in the form of private sector agreements. Under this approach, such agreements would be followed, at least in the case of broadcast transmission standards, by "government action" to incorporate the recommended technical parameters into an official standard.[10] The U.S. black and white and color television transmission standards were the output of a private sector organization, the National Television System Committee (NTSC). The NTSC was first formed in the 1940's, then later reconvened in the 1950's to deal with color transmission. These recommendations became FCC standards. The value of the NTSC mechanism is proven by the length of time -- almost 50 years -- that its standards have been in effect with only minor modifications.

III. THE GOVERNMENT ROLE IN HDTV

During the past several years, many American consumer electronics manufacturers decided to discontinue their operations. These firms decided -- presumably for good reasons -- that their assets could be put to more profitable uses. It is reasonable, therefore, to expect that these decisions will not be reversed and that other American firms will not enter the advanced television manufacturing market unless they can do so

[10] The ATSC's mandate is to develop transmission standards also for cable television, direct broadcast satellites, and any other transmission mode later deemed appropriate. Also within the scope of the ATSC's work are standards for studio production, recording and display. Whether any of these standards are appropriate subjects for government action is not clear.

with expectations of higher profits than they experienced in the manufacturing of conventional television sets and equipment.

I would like to see more American firms participating in the consumer electronics business. Indeed, there is growing opinion in the United States that American firms should participate in all of the many aspects of the advanced television consumer electronics business, including manufacturing. One of the reasons for this is concern that advanced television developments will impact related industries -- for example, semiconductor manufacturing -- and the U.S. trade deficit.

Obviously, however, something must happen in the future that did not happen in the past if American firms are to be coaxed back into consumer electronics manufacturing. While many factors will determine whether or not there is a major American reentry into this field, there are at least two fundamental preconditions, in my judgment, to such reentry. First, the government will have to establish a clearly articulated policy strongly supporting this objective (more on that point later).

Second, because American firms will be reluctant to enter the consumer electronics business if there is a high risk of adopting a "wrong" technology, technical standards must be established to ameliorate that risk. Such standards must be an adjunct to, not a substitute for, a program of government support.

There have been suggestions that advanced television standards should be employed as nontariff trade barriers to

revitalize the United States consumer electronics industry. History teaches, however, that caution is called for in this area.

In order to promote a domestic television manufacturing industry, Brazil adopted a color television standard, known as PAL-M, which is unique to that country. For various reasons this effort was unsuccessful. As a result of adopting a unique standard they have paid a premium for their television equipment, virtually all of which is still supplied by foreign companies.

France also adopted a unique color television standard, known as SECAM, to promote a domestic television manufacturing industry.[11] Rhonda Crane used this example for a case study of the use of technical standards as a nontariff device.[12] Crane's study makes clear that the French government exercised total management control -- including a very active promotion, manufacturing and marketing campaign -- and served a continuous nurturing role over a long period of time. The French government, in an effort to support the SECAM standard, performed many of the tasks fulfilled by private companies in nations such as ours.[13]

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[11] It is worthwhile noting that neither the standards adopted in France nor the standards adopted in the rest of Europe will be used for satellite broadcasting services. Decisions made in 1983, less than twenty years after European color television standards were adopted, call for new standards for satellite broadcasting. The major reason for this decision was to have a common satellite broadcasting standard throughout western Europe.

[12] Rhonda J. Crane, The Politics of International Standards: France and the color TV war, Ablex Publishing Corporation, 1979.

[13] Crane, pp. 37-87.

While the role of the government is more limited in nations where the private sector's dominance is maintained, if there is to be any chance of success of such a program in the United States, our government must make a monumental commitment to achieve its objective. Such a commitment would not end with the selection of national technical standards, it would merely begin at that point. If the government decides that it is in the national interest that American firms fully participate in the business of advanced television consumer electronics, it must first define its areas of concern. Is it concerned with who owns the consumer electronics firms? Is it concerned with where the product planning is done, or the engineering, or the manufacturing? A host of preliminary decisions must be made because each area will require different treatment. The government must then create favorable conditions for the founding and success of American firms. The Subcommittee's draft charter for this hearing lists some means of accomplishing this. I leave it to the experts in those areas to comment on their effectiveness.

It seems clear to me, however, that for American firms to participate in this business, research and development are absolutely necessary first steps. American firms might acquire a significant share of this market if decisions are made without delay and if the resulting products are sufficiently attractive to the consumer.

Even with substantial government support, success is not guaranteed. While national standards may diminish the effectiveness of foreign competition, they are not an insurmountable obstacle.[14] One reason for this is that foreign companies are normally allowed to manufacture inside the country.

Besen and Johnson analyzed the development of the color television standards used in various parts of the world and also addressed the use of standards as a protective measure. They, too, found the use of standards to be of limited value in gaining or protecting markets.[15]

I believe that the United States should not adopt a standard based on technology from a foreign country without due regard for its consequences. I also believe, however, that we should not disregard any technology just because it is foreign, or embrace another technology only because it originated in our country. We must first determine what it is we desire in an advanced television service and then adopt appropriate technical standards having a sound technical basis and widespread industry support.

R. Hopkins, June 23, 1988

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[14] Crane, p. 90.

[15] Besen and Johnson, pp. 87-98.