

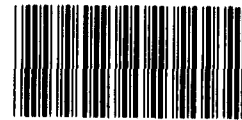
GAO

Report to the Chairman, Subcommittee
on Technology and National Security,
Joint Economic Committee, U.S.
Congress

March 1990

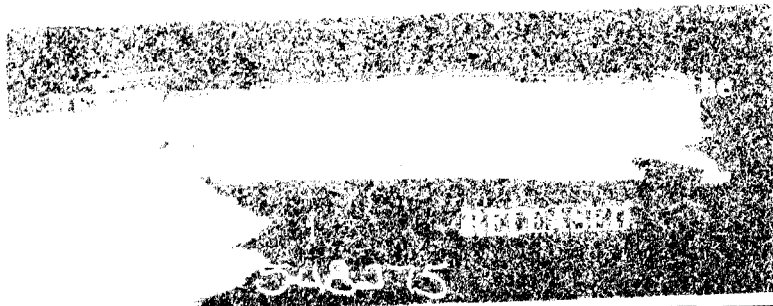
FOREIGN TECHNOLOGY

Federal Awareness of the Development of High Definition Television



141219

287



**National Security and
International Affairs Division**

B-201919

March 21, 1990

The Honorable Jeff Bingaman
Chairman, Subcommittee on Technology
and National Security
Joint Economic Committee
Congress of the United States

Dear Mr. Chairman:

In response to your request, we have developed information on the U.S. government's awareness of the development of high definition television (HDTV). You had expressed concern that the United States may have been generally unaware of HDTV's development until recently, thereby contributing to a gap in U.S. knowledge of a major foreign technological development. This report traces federal awareness of HDTV from the beginning of its development to the present.

Background

HDTV, as the name implies, means clearer, sharper TV pictures that will deliver movie theatre quality picture and sound in people's homes. Much of the interest in HDTV has centered on its potential uses in the television, motion picture, and consumer electronics industries. HDTV is expected to increase significantly the sales of videocassette recorders, video cameras and television sets. According to one estimate, consumer sales of televisions with HDTV capability could exceed \$20 billion a year by the late 1990s. But, because HDTV includes the merging of broadcasting, communication, and computer technologies, it is also a driving force for several other industries, including semiconductors and fiber optics.

Results in Brief

Federal agencies as well as the private sector have been aware of HDTV's development for years. In particular, the Departments of Commerce and Defense, as well as the National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA), have followed advances in the industry since the 1970s. In December 1981, information about HDTV was presented during a congressional hearing. The focus of the hearing was satellite communication. HDTV, which can be broadcast using satellite transmission, was extensively discussed by several knowledgeable witnesses. Since that time, several federal agencies and congressional committees have continued to address policy issues affecting HDTV.

HDTV Has Been Under Development for Some Time

Early HDTV development began in the mid-1960s. The Japanese government first explored HDTV following the Tokyo Olympics in 1964. In 1970, Japan began a formal research program and by 1979 started broadcasting HDTV on a test basis.

By 1983, a major Japanese electronics company, Sony, began to commercially market a complete line of HDTV studio production equipment. In 1988, the Japanese government broadcast the Seoul Olympic Games in HDTV. And in June 1989, it broadcast HDTV for an hour a day, via satellite, to large screen receivers in department stores and shopping centers to promote it to the public. The Japanese government plans to begin regular HDTV broadcasting in 1991.

The United States Has Been Aware of HDTV for Almost 20 Years

The Departments of Commerce and Defense as well as the NSF and NASA have been aware of Japanese efforts to develop HDTV since the 1970s. A Commerce Department official told us that his office knew about Japanese HDTV efforts as early as 1975. However, the HDTV monitoring information being gathered by his office, including the potential impact of HDTV on the U.S. computer and semiconductor industry, went unheeded because the U.S. consumer electronics industry, according to a 1975 Commerce report, was in decline. In the late 1970s, however, some private U.S. firms began researching HDTV. Notwithstanding this interest, relatively little has been spent on research efforts so far. Through early 1988, private companies collectively have spent about \$70 million on HDTV research.

Other agencies have also shown an interest in HDTV. In 1983, NASA established a separate directorate for television development, which focused on the development of uses for enhanced television. We reported in December 1989 that NASA believes that HDTV has several space program applications, including launch control and evaluation and space station operations.¹

A 1989 report² prepared for the Department of Defense (DOD) on Japanese HDTV noted that Japanese researchers had been publishing papers describing various developments in HDTV for more than 10 years. DOD is

¹High Definition Television: Applications for This New Technology (GAO/IMTEC-90-9FS, Dec. 11, 1989).

²Japanese Developments in High Definition Television, TechSearch International, Inc., Austin, Texas, September 1989.

interested in HDTV because it has numerous defense applications, including the ability to provide enhanced graphic displays, such as flight simulation.

Congress was apprised of HDTV in the early 1980s. On December 15, 1981, the Subcommittee on Telecommunications, Consumer Protection, and Finance of the House Committee on Energy and Commerce, held a hearing on satellite communications issues. In that hearing, the testimony of several TV and broadcast industry representatives included discussion of the benefits of HDTV. One witness, representing one of the major television networks, described HDTV as possibly representing the most significant communications development since the advent of television itself. This witness stated that his network planned a series of HDTV demonstrations during January and February of 1982 and expressed the hope that the Subcommittee and its staff would view HDTV firsthand. He said that his network was expecting to do several experimental broadcasts, including the 1982 Rose Bowl Parade. The broadcasts occurred and were considered a success by the network.

Setting HDTV Standards

This month we reported to the Chairman, Subcommittee on Telecommunications and Finance, House Committee on Energy and Commerce, that throughout their efforts to develop HDTV, the Japanese continually submitted documents to the International Radio Consultative Committee, a United Nations organization involved with telecommunications, noting their progress.³ As a result, in the early 1980s, the Committee became interested in HDTV and initiated efforts to adopt a worldwide HDTV production standard. The State Department, as part of its role as the U.S. representative to the Committee, initiated action to develop a U.S. position on a worldwide production standard. At the Committee's 1986 plenary meeting, the United States and Japan proposed a worldwide HDTV production standard. The European Community, however, opposed it, primarily for political and economic reasons. Many believe that the European Community—in the interest of protecting European television manufacturers from Japanese competition—rejected it because they believed its adoption would provide the Japanese a marketing advantage in consumer equipment such as television sets and videocassette recorders. The resulting controversy subsequently led the State Department to favor postponement of a decision. To date, no international standard has been set.

³High Definition Television: The Effects of Standards on U.S. Entertainment Industries (GAO/IMTEC-90-33, Mar. 16, 1990).

In 1987, the Federal Communications Commission, responding to a request from the broadcast industry, initiated an inquiry into HDTV. The inquiry has dealt largely with avoiding disenfranchisement of over-the-air broadcast television companies because of the differing standards for broadcasting HDTV. Currently, the Commission is examining a number of proposals for over-the-air HDTV broadcast systems.

Current Concern About HDTV

To assess the commercial market for HDTV, the Commerce Department's National Telecommunications and Information Administration commissioned a study by Darby Associates, a Washington, D.C.-based consulting firm. This study, known as the Darby Report, was issued in early 1988. It concluded that if HDTV replicates the growth of color TV and videocassette recorders, the market could expand rapidly to achieve annual sales of almost 19 million units by the year 2008.

According to an American Electronics Association official, the Darby Report communicated to the electronics industry the growing importance of HDTV and its long-term strategic and economic impact. Therefore, later in 1988, the association raised concerns about the broader implications of the HDTV issue. In response to these and other concerns, hearings have been held in the 100th and 101st Congress. The issues addressed progressed from concern over domestic HDTV standards and frequency allocations, to how to ensure U.S. electronics industry participation, to debate about whether the development of HDTV can or should be a primarily government-led effort because of its future importance to U.S. industry.

Scope and Methodology

To examine U.S. awareness of the development of HDTV, we reviewed a number of reports and journal articles. We used these documents and discussions with federal and private sector officials to identify some key events in HDTV's development and to identify points at which federal agencies became aware of the technology. We further discussed the issues of HDTV technology and federal awareness with officials of the Departments of Commerce and Defense, NASA, and NSF, as well as with university researchers and industry representatives. Our review was conducted between September 1989 and January 1990. As you requested, we did not obtain agency comments on this report. However, throughout our review we discussed these issues with agency officials and have incorporated their comments where appropriate.

As agreed with your office, unless you announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time we will send copies to interested parties and make copies available to others upon request.

GAO staff members who made major contributions to this report were Steven Sternlieb, National Security and International Affairs Division, and Thomas McGrane, Boston Regional Office. Please contact me at (202) 275-4812 if you or your staff have any questions concerning this report.

Sincerely,

A handwritten signature in black ink that reads "Allan I. Mendelowitz". The signature is written in a cursive style with a large, stylized 'M' at the end.

Allan I. Mendelowitz, Director
Trade, Energy, and Finance Issues

Requests for copies of GAO reports should be sent to:

U.S. General Accounting Office
Post Office Box 6015
Gaithersburg, Maryland 20877

Telephone 202:275-6241

The first five copies of each report are free. Additional copies are \$2.00 each.

There is a 25% discount on orders for 100 or more copies mailed to a single address.

Orders must be prepaid by cash or by check or money order made out to the Superintendent of Documents.

**United States
General Accounting Office
Washington, D.C. 20548**

**Official Business
Penalty for Private Use \$300**

**First-Class Mail
Postage & Fees Paid
GAO
Permit No. G100**
