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1 March 1989

MEMORANDUM FOR: Chief, Liaison and Requirements Branch  
FROM:   
                  FBIS/Science and Technology Center  
SUBJECT: Japanese high-definition television developments

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Attached is the reporting on Japanese high-definition television developments collected from the English-language Tokyo press from September 1988 to February 1989. It was prepared with an understanding that the Subcommittee on Telecommunications and Finance of the House Committee on Commerce and Finance is holding a hearing on this subject-matter on 8-9 March. I thought you might like to send this information to Legislative Liaison for their possible distribution on the Hill. Comments and questions may be directed to

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Asahi Evening News / SEP 1  
Japan Times \_\_\_\_\_  
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## To Improve Quality of TV Pictures EDTV System to Be Tested

Japan's major TV networks will soon begin testing a new broadcasting system that should significantly improve the quality of TV pictures.

The system, called Extended Definition TV (EDTV), is a compromise of sorts between broadcasters and supporters of a more advanced and costly system called High Definition TV (HDTV). Consumers will have to purchase new TV sets to get the benefits of EDTV. But unlike with HDTV, they can continue to receive EDTV broadcasts using their existing sets, although the picture will not be improved.

The Japan Broadcasting

Corp. (NHK) will use the EDTV system to transmit 18 still pictures from its headquarters in Tokyo to a station in Tochigi Prefecture, north-east of Tokyo, at the end of regular programming on Sept. 2.

Other commercial networks will eventually conduct similar tests, which will put them one step closer to the adoption of the EDTV system. If the experiments are successful, broadcasting based on the EDTV system may be launched next summer, according to officials at the Ministry of Posts and Telecommunications.

The officials said they hope EDTV will serve as a bridge

to the more sophisticated HDTV system, which proponents hope will be widely used in the early 21st century.

Both systems improve picture quality by increasing the number of scanning lines that make up a TV image. Such lines actually occupy only half the space on a television screen, although the human eye is tricked into seeing a full image.

In HDTV, the number of scanning lines that are broadcast is doubled. In EDTV the current number of scanning lines are broadcast, although the quality of the transmission is improved

through the use of new broadcast cameras and other equipment. Special EDTV sets will store the scanning lines in a computer chip and then project those lines on the screen in between lines being transmitted from a TV station, effectively doubling the number of lines.

Although EDTV sets are initially expected to cost about twice as much as standard sets, they will eventually come down in price, according to proponents.

There are now a number of improved television broadcast systems under development in Japan, Europe and the United States. Many broadcasters in the United States and Europe are hesitant to embrace NHK's HDTV, although it is the most advanced system developed so far, mainly because it will require them to switch from terrestrial to satellite broadcasts. HDTV will also make millions of existing TV sets obsolete.

—Asahi News Service

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{hl}NHK Promotes High-Definition TV with Olympics  
{sl}OW1709063588 Tokyo KYODO in English <1>0540 GMT 17  
Sep 88

{txt}[Text] Tokyo, Sept. 17 KYODO -- Japan Broadcasting Corp. (NHK) took advantage of the Seoul Olympics to promote the use of high-definition television sets, called next-generation television, officials said Saturday.

High-definition television, dubbed "high vision" in Japan, provides higher resolution imagery that projects a more realistic effect than conventional color TV sets.

In a joint effort, NHK and the Ministry of Posts and Telecommunications, installed high-definition TV sets at 81 selected locations nationwide to telecast the 16-day Olympic games opened Saturday, the officials said.

The 81 locations include concourses of major Japanese Railways (JR) stations, large department stores and showrooms of consumer electronics appliance makers.

The festive opening ceremonies of the Olympics were broadcast live to the 81 locations from 9:40 A.M. via a communications satellite.

Except for the opening and closing ceremonies that will be telecast live, the Olympic games will be videotaped, then flown back to Japan and edited into TV programmes two to four hours long that will be aired in Japan, they added.

Mainichi Daily News \_\_\_\_\_  
 Japan Times \_\_\_\_\_  
 Daily Yomiuri \_\_\_\_\_  
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 Kyodo Press \_\_\_\_\_  
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**Hitachi to Market Extended Definition TV**

Hitachi, Ltd. will market a 33-inch extended definition (ED) television on Dec. 20, the company has announced. Consumer electronics makers are expecting sales of the TVs to heat up from the end of this year nearing the start of ED television broadcasting scheduled in April next year. The ED TV will be launched to counter the high definition TV, promoted by Japan Broadcasting Corp. ED TV can screen conventional TV programs with clearer definition. Hitachi's new TV, C33-ED1, will cost ¥450,000 a unit.

Asahi Evening News 26 Sept  
Mainichi Daily News                      P4  
Japan Times                       
Daily Yomiuri                       
Japan Economic Journal                       
Jiji Press                       
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### Japan, EC to Discuss HDTV Standards

Japan will have bilateral talks with the European Community (EC) on setting standards for high-definition TV (HDTV) in London Thursday. Japan expects difficulty in setting an international standard and intends to convince the EC that its desire to set a common standard is not for the purpose of securing Japanese HDTV sales in the world market. The EC has been developing an HDTV with a different standard and the United States also expects to set their own standards. The Ministry of Posts and Telecommunications, Sony and the Japan Broadcasting Corp. (NHK) will attend the talks from Japan, and the EC secretariat, representatives of EC member countries and major electrical appliance makers, including Philips, will attend from the EC.

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 Mainichi Daily News \_\_\_\_\_  
 Japan Times 1 OCT P13  
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 Japan Economic Journal \_\_\_\_\_  
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 Kyodo Press \_\_\_\_\_

# Japan, Europe to seek accord on high-definition television

LONDON (Kyodo) Japan and the European Community agreed Thursday to work out unified international technical guidelines for high-definition television (HDTV), a Japanese official said.

The accord was reached by working-level officials from both sides at the EC's London office, the official said. The working-level talks were the second ones held after a

series in Tokyo March 9.

Both sides recognized the extreme difficulty of working out unified guidelines.

The accord came several weeks after the U.S. Federal Communications Committee set technical guidelines for HDTV in which foreign systems would have to be modified to be viable in the lucrative U.S. market.

HDTV provides much sharper television images than conventional color TV.

The HDTV technology provides higher picture resolution than current television technology by increasing the number of lines that comprise

the total image. Japanese HDTV uses 1,125 lines, up from the conventional 525 lines.

Japanese companies are already demonstrating HDTV technology to the public via telecasts of the Seoul Olympics over 205 HDTV sets installed at 81 locations, such as the concourses of Japan Railway stations.

The delegates told the EC Japan plans to initiate public HDTV broadcasts in two year's time.

The EC, which has developed its own HDTV technology, said it planned to improve its technology.

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{h1}Japan: HDTV Converter Developed

{s1}OW0410184188 Tokyo KYODO in English 1329 GMT 4 Oct  
88

{txt}[Text] Tokyo, Oct. 4 KYODO -- Japan Broadcasting Corp. (NHK) on Tuesday announced the development of a converter that enables high-definition TV (HDTV) programs to be viewed with conventional TVs.

An NHK spokesman said that Sanyo Electric Co. and Mitsubishi Electric Corp. have cooperated with NHK in the development of the MUSE/NTSC converter.

NHK has developed an HDTV system using the MUSE (multiple subnyquist sampling encoding) formula for transmitting signals. This system is called "Hi-Vision." NHK made a test HDTV broadcast of the Seoul Olympics from Sept. 17 to Oct. 3. The corporation plans to start a full-scale HDTV broadcast two years later, using a broadcasting satellite, BS-3, to be launched two years later.

The newly developed converter converts MUSE signals, to be used in NHK's HDTV broadcast, into NTSC (U.S. National Television System Committee) signals, used in conventional U.S., Japanese and other TV broadcasts, the spokesman said.

He said that one can view a Hi-Vision program by attaching the converter, a satellite antenna and a tuner to a conventional TV set. He added, however, that the quality of the Hi-Vision picture appearing on the screen of a conventional TV set is naturally no better than that of conventional TV pictures.

He said that the conventional TV set with a built-in MUSE/NTSC converter or an independent MSSE/NTSC converter would probably be marketed.

Sanyo and Mitsubishi are preparing to produce the LSI circuits of the converter by next spring so that it can be commercialized later in 1989.

The price of the converter has yet to be determined, but will probably be in the 10,000-20,000 yen range, according to NHK.

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Mainichi Daily News \_\_\_\_\_  
Japan Times \_\_\_\_\_  
Daily Yomiuri \_\_\_\_\_  
Japan Economic Journal \_\_\_\_\_  
Jiji Press \_\_\_\_\_  
Kyodo Press \_\_\_\_\_

# Electronics Show Spotlights EDTV

Japan's electronics wizards showed off extended definition televisions, cameras that make film obsolete and other high-tech toys Thursday, the start of Japan's annual electronics show.

But visitors will need fat pocketbooks if they want to do more than look, because the high yen has put this year's high tech beyond the reach of most.

More than 400,000 visitors are expected at the six-day exhibition which covers everything electronic from fuses to flat-screen TVs.

All eyes were focused on extended definition televisions (EDTVs) which industry analysts expect to become standard fare in five or six years.

EDTV receivers are improved versions of digital televisions marketed in the mid-1980s. These sets exploit advances in digital signal processing and semiconductor memory to effectively double the number of horizontal scan lines.

Unlike the digital TVs, however, EDTV sets can also receive specially encoded EDTV broadcasts which Japan plans to begin some time

in 1989. The new broadcasts, which will require new studio equipment, can be seen on normal sets without any improvement in picture quality.

But the EDTV set displayed by Panasonic retails at a hefty ¥388,000 (\$2,900).

Electronic still cameras that record images on video floppy discs instead of film also attracted throngs at the show.

These cameras have been sold for several years, but have appealed to only a small, professional audience because of their high cost and poor performance compared to film cameras. Now they deliver similar picture-quality to that of the conventional television used to display the image.

And their prices are lower—if still beyond the weekend photographer's likely budget. Sony's Mavica still video camera, among the cheapest, retails for ¥69,800 (\$525), and the adaptor necessary to link the camera to the display TV sells for ¥30,000 (\$225).

All the major TV makers also displayed Japan's high definition TV (HDTV) system known as Hi-Vision, even more advanced technology than EDTV. It boasts screen quality comparable to 35mm film. But the main emphasis appears to be on the EDTV.

"Japan is backing off from its all-out push for its HDTV format and putting more emphasis on EDTV because the manufacturers want to get things going as soon as possible," said industry analyst Darryl Whitten, vice president of Prudential-Bache Securities.

The switch reflects last month's decision by the U.S. Federal Communications Commission to require the adoption of an HDTV broadcast system compatible with current receivers. The European Community has also urged a system that would not render current sets obsolete, Whitten said.

Hi-Vision broadcasts, set to begin in Japan in 1990, would be received on special sets only. —Reuter

Mainichi Daily News \_\_\_\_\_  
 Japan Times \_\_\_\_\_  
 Daily Yomiuri \_\_\_\_\_  
 Japan Economic Journal 8 Oct 93  
 Jiji Press \_\_\_\_\_  
 Kyodo Press \_\_\_\_\_

# U.S. stand on HDTV miffs Japan

By Makoto Hirose

NHON KEIZAI SHIMBUN STAFF WRITER

The Ministry of Posts and Telecommunications (MPT) and Japan Broadcasting Corp. (NHK), a public company, are a bit upset because the U.S. government came out with an independent approach on the adoption of a standard for high-definition television (HDTV).

At one point, it appeared as though the U.S. would go for Hi-Vision, an NHK version of next-generation TV, unlike the European Community (EC) which is clearly going its own way. However, the Americans have recently shown interest in a different system.

## Surprising news

On Sept. 2, when MPT and NHK were busy preparing to test the Hi-Vision system during the Seoul Olympics, a piece of news arrived from Washington.

The news centered on the provisional decision of the U.S. Federal Communications Commission (FCC) stating that the U.S. prefers a terrestrial-based HDTV standard to a satellite-based one and that it required compatibility of the HDTV system with conventional models.

In a press interview on the same day, Seikichi Sakakibara, chief of the technology section of the ministry's broadcast administration bureau, suppressed any sign of surprise.

As he put it, the FCC did not entirely rule out the possibility of accepting NHK's proposed screen of 1,125 scanning lines and 60 Hz field frequency for ground studios, while refraining

from talking about the satellite-based format. Unfortunately, the Japanese 1,125-line system does not fit the U.S. interest in a system compatible with double the 525 scanning lines of today's American TV signals.

## Compatibility

Kenji Hori, head of Sony Corp.'s HD Technology Center, said the U.S. could well stay away from the Japanese method.

## 'Behind the recent FCC move is the great commercial potential of HDTV'

In fact, a leading U.S. consumer electronics maker appears ready to take to 1,050 scanning lines.

At the general meeting of the Consultative Committee on International Radio (CCIR) in May 1986, the EC refrained from agreeing to use the Japanese standard. Not surprisingly, the Japanese showed no interest in a European system. On the contrary, for at least two years the U.S. and Canada apparently showed some signs of interest in the Japanese HDTV standards.

America's Society of Motion Picture and Television Engineers decided to recommend the Japanese standard. The American National Standards Institute was also about to register it.

"Behind the recent FCC move is the great commercial potential of HDTV and related equipment," said Katsumi Ohsuga, chief of the ministry's Hi-Vision promotion office.

"The FCC's recent announcement naturally reflects the hopes of American consumer electronics makers to regain lost ground with their own HDTV system," Ohsuga noted.

At the general meeting of CCIR scheduled for May 1990, the standards of HDTV will be finalized.

The FCC, which has consumer interests in mind, favors a compatible system so that people will not have to buy new sets to receive the signals.

With the proposed American system people could keep their old sets (with 525 lines) and receive 1,050-type HDTV signals, although they would not obtain the better picture. However, the Japanese system opts for everyone buying a new set.

Currently, eleven Japanese consumer electronics makers are planning to produce HDTV sets, with each spending billions of yen on development efforts.

## American supporters

Naturally, Japanese specialists who back the NHK system maintain that Japan's Hi-Vision system is capable of finding steady supporters in the U.S., including a few Hollywood movie companies.

The Japanese viewpoint is that a single standard of the new TV system should be adopted so that hardware and software makers can thrive. MPT officials, lobbying hard for the NHK system, do not appear to be discouraged, as they pin great hopes on further bargaining with the FCC. The FCC, however, has no history of bargaining.

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Kyodo Press \_\_\_\_\_ Pa3

**NEC makes HDTV  
breakthrough**

NEC Corp. has developed technology to convert signals formulated for the proposed high-definition television system to those receivable by the system currently available. The technology divides a high-definition image into 12 segments, three rows and four files, thus being suitable for a makeshift "large screen" consisting of 12 cathode ray tubes (CRTs).

NEC will commercialize the system next spring, targeting its use in industry for exhibitions and displays, a company spokesman said.

(The NIKKEI-M, Sept. 28, P9)

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 Japan Times \_\_\_\_\_  
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# Japan Determined to Stick With Its HDTV

BY Fumio Igarashi

Asahi Shimbun Reporter

Developers of Japan's version of high-definition video remain optimistic that their technology will prevail, and a nationwide promotion campaign keyed to TV coverage of the Seoul Olympic Games is helping brighten that image.

Analysts who follow the consumer electronics industry see a somewhat darker picture, however, arguing that a recent ruling by the U.S. Federal Communications Commission (FCC) makes it less likely that an international standard on high-definition television can become reality.

High-definition TV is intended to provide a video image virtually without distortion or visible lines, with clarity and depth almost on a par with a motion picture shot with 35mm. film.

The FCC ruled that any high-definition video technology applied in the United States must be compatible with the present broadcast scanning method, known as NTSC, and must be able to be used with over-the-air broadcast equipment, rather than requiring special broad-band frequencies from satellites.

The Japanese version of high-definition video, called Hi-Vision, is not compatible with any present telecasting technology, and is intended primarily for transmission via satellite.

The method was developed over the past 18 years in Japan as a joint project led by NHK (Japan Broadcasting Corp.), with participation of some of Japan's largest consumer-electronics manufacturers, and had been supported by broadcast engineers and industry experts worldwide. After consultations with the American motion picture industry, the proportions of the screen for HDTV, called the aspect ratio, or the relationship of screen width to screen height, were modified to match those of a VistaVision motion picture image.

## Expo Debut

Hi-Vision was premiered to the general public in Japan at the Tsukuba Science Expo 1985, when it was widely heralded as the most important development in video technology since the transition from black-and-white TV to color in the early 1960s.

With technical modifications, the current Hi-Vision

was used for live coverage of the Seoul Olympiad, beamed to Japan to be shown on large screens at department stores and other high-traffic areas throughout Japan. Japan plans to have Hi-Vision broadcasts on a regular schedule by mid-1990, by which time a third telecommunications satellite is to be placed in orbit to provide coverage for most of the Japanese archipelago.

## FCC Decision a Blow

But some critics say the FCC decision, coming as it did just before the Olympics, was a blow to the medium, and to NHK's effort to win international acceptance of its technology as the single standard.

"I think the decision hurt the NHK project considerably, since it came at such a time, right before the start of Olympic broadcasts, said Sadanobu Aoki, a broadcast industry critic.

It has not hurt the public acceptance of Hi-Vision in Japan, judging from the crowds which regularly gathered around the displays to watch daily Olympic highlights. Indeed, the industry in Japan is already applying Hi-Vision technology for professional and commercial video production, to shoot daily rushes for motion pictures, and to provide realistic video images for such special uses as flight-simulation equipment.

But the consumer electronics industry—Japan's most active manufacturing sector measured by annual growth of production value—has higher goals, eyeing what the Ministry of Posts and Telecommunications estimates as a potential ¥3.4 trillion (\$25 billion), considering the applications in videodisc players, VTRs and TV sets.

Unification of standards would be crucial for the industry, primarily because the broadcast technology involves a more complex, hence expensive, hardware which must be produced in quantity to be commercially viable. The key, in the minds of industry authorities, engineers and critics alike, is in controlling that market potential.

"The United States seeks compatibility with the existing TV system because it recalls the confusion it once experienced by adopting an incompatible system at the time of the first color telecasts," said Aoki. "It is wrong to push Hi-Vision so hard without considering compatibility."

Compatibility would mean compatibility not only with the NTSC standard used in the United States, Japan, Korea and some other countries, but also with PAL and SECAM variants used in South America, China, Southeast Asia and most of Europe. The systems vary slightly in the number of scanning lines required to

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Mainichi Daily News \_\_\_\_\_  
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build an image on a television screen. NTSC has 525 lines, while PAL and SECAM have 625 lines.

### European Challenge

A move to counter the Hi-Vision standardization drive was initiated by France for Europe, in effect doubling the number of scanning lines of PAL-SECAM in a system called HD-MAC. The international body which approves broadcast standards has given the Europeans additional time to develop its version of high-definition video. For the industry, that means more waiting to determine which of several possibilities might win out in different markets.

"At this time, I think it's almost impossible to unify the Japanese and European standards," said Takayasu Yamazaki, chief of NHK's New Media Promotion Department. "It is no longer a question of which is better, but a fear that Japan would dominate the world market again if they approve of the system."

Japan grew to become the world's largest supplier of color televisions, a position it continues to hold. But even in the United States, which, until three years ago, had embraced the modified Hi-Vision standard for broadcasting, and which had agreed in August 1987 to adopt, engineers have begun to waver in their support. As one official from Japan's Posts and Telecommunications Ministry said privately, "There have been several last-minute maneuvers in an attempt to bury the Japanese proposal at any cost."

### Pressure on U.S.

Junichi Ishida, deputy director of the NHK Research Center, where most of the seminal HDTV work was done, put it more bluntly:

"Some U.S. electronics makers have been under pressure from European manufacturers since France's Thomson-Brandt bought out RCA Corp.'s (television business). Europeans are trying to destroy the programming standards to try to obstruct Japan. Even the technical world has been affected by politics and has bowed," Ishida said.

Some Japanese manufacturers say NHK and government officials may have been too hasty or too earnest in promoting Hi-Vision worldwide. An executive of one of Japan's largest consumer electronics manufacturers, who asked not to be identified more specifically, said, "I think their approach to make it a fait accompli and make (everyone else) accept it is too much. Then they could say, 'Then why don't you do it yourself.' Japanese VCRs have dominated the world, but when it comes to television, neither Europe nor the United States have any intention of abdicating."

For Akira Hirota, chief of the Video Research Center for JVC Corp., one of Japan's original TV developers, high-definition video is now in "an era of chaos. It is equally a period of concern, according to Kenji Hori, Hirota's counterpart at Sony Corp., who said, "For the manufacturer, it is more important to know whether there will be a market, rather than what standard it will use,"

But waiting out the industry abroad has not meant Japanese manufacturers are doing nothing. As Takehiko

Koto, director of Toshiba's New Media Promotion Department, explained, "For the time being, we are making preparations on the assumption that Hi-Vision will at least be inaugurated via satellite in Japan. We just have to take the word of NHK and the (telecommunications) ministry."

—Asahi News Service

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### Bureau OKs NHK Format

The American National Standards Institution (ANSI) has endorsed the high-definition television technology developed by the Japan Broadcasting Corp. (NHK) as a standard for U.S. TV studios, NHK officials have announced.

However, the U.S. Federal Communications Commission in September made a preliminary decision to re-

ject the NHK-developed technology as a format for transmitting high-resolution images.

ANSI is an industry research bureau.

The ANSI decision came after a six-month study of NHK's technology. The study was launched in April after ANSI received a request by the U.S. Society of Motion Picture and Television Engineer to adopt the NHK format as the U.S. standard.

The endorsement, though not compelling, means the NHK method is likely to be adopted widely in the U.S. TV industry, the officials said.

Despite the FCC rejection, NHK is confident about the technology, saying High-Vision can be rendered compatible with conventional TV by using an adaptor to conform with the FCC requirement, the officials said.

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 Japan Economic Journal 15 Oct  
 Jiji Press \_\_\_\_\_  
 Kyodo Press \_\_\_\_\_ P19

## TTNet plans to transmit HDTV via firm's fiber optic cables

Tokyo Telecommunication Network Co. (TTNet), a new regional common carrier affiliated with Tokyo Electric Power Co., Oct. 4 will apply a high-definition TV format for image transmission via optical-fiber cables on an experimental basis. The company hopes to enter the HDTV telecom services market with its newly developed analog transmitter for optical fiber transmissions.

In the experiment, TTNet plans to transmit image signals on a high-definition picture scanning format that was proposed by Japan Broadcasting Corp. (NHK), called Hi-Vision. NHK, the sole public broadcasting company in Japan, plans to start satellite broadcasting with

the Hi-Vision format in 1990. TTNet expects to use the format for cable TVs and other image telecommunications via fiber optic cables.

Usually, common carriers for such optical transmissions use digital signals, which suffer less from decay during long-distance transmissions than analog signals, although the cost is high. TTNet claims that it has developed a new analog transmitter jointly with Tokyo Electric Power Co. and NEC Corp., which features less decay.

TTNet, a new common carrier, serves nine prefectures around Tokyo, which is serviced by the power utility.

(NI, Oct. 4, P1)

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Kyodo Press \_\_\_\_\_ P.17

**NHK makes converter  
for Hi-Vision TV**

Japan Broadcasting Corp. (NHK) has jointly developed a television converter with Sanyo Electric Co. and Mitsubishi Electric Corp. The new converter enables users to receive television images for NHK's Hi-Vision with conventional television sets. The companies expect to commercialize the converter by next spring. NHK's system is one of several for high-definition TVs in the world.

(The NIKKEI-M, Oct. 5, P8)

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 Japan Economic Journal 22 Oct  
 Jiji Press \_\_\_\_\_  
 Kyodo Press \_\_\_\_\_ P5

# Firms are ready to meet any HDTV format

**By Hisayuki Mitsusada**  
 JAPAN ECONOMIC JOURNAL STAFF WRITER

Despite dimming prospects that a single global standard for the next-generation of television will be adopted, the Japanese government and electronics manufacturers remain undaunted by recent international moves.

The U.S. Federal Communications Commission, which oversees radio transmission standards, adopted a "go it alone" stance when it made a preliminary decision on high-definition television (HDTV) last month, many observers say.

Japan had hoped the U.S. would adopt its Hi-Vision HDTV system, developed by NHK, Japan's public service broadcasting company.

## No ruling out

To Japanese companies and government officials, however, the U.S. move neither precludes firms' future involvement in making HDTV sets for the American market nor completely rules out adoption of the Japanese format.

They hope they can also make HDTV sets for the European market. There, the European Community is planning its own format, called HD-MAC.

"Whatever the format, we are technically ready to respond," said Sony Corp. Vice President Masahiko Morizono.

Added Hiroyasu Tatsumi, a corporate planning manager at Matsushita Electric Industrial Co., "Although a common standard is certainly desirable, we

were anticipating this (FCC's decision) development."

According to government officials, there are numerous reasons to be excited about HDTV, whatever formats become the norm.

First, the Ministry of Posts and Telecommunications notes that the FCC only sets transmission standards, and it is up to private firms to decide on a picture format, called the studio standard.

Second, the FCC is still studying three Japanese ways of transmitting HDTV programs for use on TV sets now in use.

Third, while U.S. electronic makers eye competition with Japan, U.S. motion picture producers want to adopt the Japanese picture format.

Fourth, the potential market is enormous. Today, about 150 million television sets are in use in Europe, 70 million in Japan and 200 million sets in the U.S.

A ministry panel expects the HDTV market to grow to ¥3.3 trillion a year by the year 2000 in Japan alone.

## Compatibility

In essence, the FCC wants U.S. HDTV to be compatible with existing television sets and to use ground stations to beam TV shows into viewers' homes. This is a major policy difference with Japan and Europe, both of which propose transmissions direct from satellites.

One major format difference between Japan and Europe is the number of scanning lines per screen. The NHK format uses 1,125 scanning lines while the

EC system uses 1,250 scanning lines.

Also, the Japanese HDTV has a field frequency of 60 Hz, meaning that moving images are created by switching pictures 60 times a second. The EC system uses 50 Hz.

Japan's format has been designed for many uses — for TV, as a basic picture format for printing and for making motion pictures. And at the 1986 meeting of the Consultative Committee on International Radio, an arm of the International Telecommunications Union, Japan had hoped to make Hi-Vision the international standard.

But Europeans blocked that plan, forcing the telecommuni-

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 Kyodo Press \_\_\_\_\_ *PS*



A crowd at an electronics show in Tokyo watches a Hi-Vision broadcast from the Seoul Olympics.

about ¥500,000 by 1992, most manufacturers doubt they can reach this goal.

Recently, NHK broadcast the Seoul Olympics on more than 80 Hi-Vision screens in public places throughout Japan, in cooperation with about a dozen electronics makers, including Sony, Matsushita Electric Industrial and Victor Co. of Japan (JVC).

Now, EC is trying to catch up, saying its system will be ready for practical use by 1992. The Europeans demonstrated their first prototype of the MAC system, which will become the base for the finer HD-MAC system, in an electronics show in Britain timed for the bilateral talks.

Europeans are promoting their system by stressing its compatibility with current TVs. However, the Japanese say their HDTV offers a better picture and is closer to completion.

Belatedly, Americans began to devise their own systems, seeing a chance to regain lost ground in the consumer electronics field.

But unlike Japan and Europe, several different versions are being developed, including the Advanced Compatible Television of the David Starnoff Research Center and the Glen system of the New York Institute of Technology.

cations union to defer a decision until 1990.

The two sides also failed to reach compromise in bilateral talks held in late September in Britain.

**Japanese threat**

Both Europe and U.S. manufacturers are concerned the Japanese will overwhelm their markets if a Japanese standard is adopted.

Japan's system is already in operation, with the major problem being the cost of manufacture. At present, a set would cost as much as ¥10 million, according to a manufacturer. And although the ministry and NHK want the price to be lowered to

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Asahi Evening News \_\_\_\_\_  
 Mainichi Daily News \_\_\_\_\_  
 Japan Times \_\_\_\_\_  
 Daily Yomiuri \_\_\_\_\_  
 Japan Economic Journal 22 Oct  
 Jiji Press \_\_\_\_\_  
 Kyodo Press \_\_\_\_\_

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## Single HDTV standard unlikely; Hi-Vision converters developed

*What are HDTV's short-and long-term prospects? Is Japan's Hi-Vision format likely to become a world standard?*

*In a recent interview with Hisayuki Mitsusada of The Japan Economic Journal, Seikichi Sakakibara, engineering division director of the Ministry of Posts and Telecommunications, addressed HDTV's future. Sakakibara recently participated in talks with the EC.*

**JEJ:** What is the prospect for reaching a single standard with the EC?

**Sakakibara:** It seems very difficult. When we have developed our respective technologies this far, it becomes hard to give in.

I felt that they are aware our system is superior in picture quality. An official from an EC nation personally told me they might double the field frequency to eliminate flicker, which their official version cannot avoid.

**JEJ:** The U.S. Federal Communications Commission's preliminary decision in September seems to indicate the U.S. switched from supporting Japan to a separate course.

**Sakakibara:** That is not correct. HDTV standards have two aspects. One is the studio standard and the other is the transmission standard.

The FCC decision concerns only the latter, and the use of earth-based transmission has been the U.S. policy from the very beginning.

As for the studio standard,



Seikichi Sakakibara

which in the U.S. only the private sector decides, the American National Standard Institute recently decided to support the Japanese standard, following the Society of Motion Picture and Television Engineers, which has been our supporter all along.

**JEJ:** Both Europe and the U.S. stress compatibility with the existing system. How will Japan respond to this?

**Sakakibara:** As for Europe, their HD-MAC is not compatible with current European TVs. It is only compatible with the new MAC satellite broadcast they are now trying to start.

As for us, converter technology is already available for receiving Hi-Vision on conventional sets. When mass produced, it will cost only ¥13,000 (\$100) for a maker to add that feature to a TV set.

So the Japanese system offers more compatibility than the EC version.

Minichi Daily News  
Japan Times 26 Oct p20  
Daily Yomiuri \_\_\_\_\_  
Japan Economic Journal \_\_\_\_\_  
Jiji Press \_\_\_\_\_  
Kyodo Press \_\_\_\_\_

# 'Hi-fi TV': Opportunity knocks

**A**pproximately once every decade, a new consumer electronics technology emerges on the international scene and provides an immense opportunity to companies that have prepared to manufacture the related products. In the early 1980s, the big consumer electronics hit was the videocassette recorder (VCR). Although demand has tapered off, many Japanese and some European companies did very well with it. Regrettably for them, American manufacturers passed up the opportunity to produce home-use VCRs, even though the basic technology itself — for large, professional-model videotape recorders — was invented in the U.S.

The major opportunity now facing the global electronics industry is high-definition television (HDTV, sometimes also called Hi-fi TV) and compatible videocassette recorders for it. Japan Broadcasting Corp. (Nippon Hoso Kyokai, or NHK) has been at the forefront of innovative research on this improved television technology for more than 15 years, and this country's electronics manufacturers are already well-positioned in the developing field.

HDTV has excited worldwide interest because it produces an image that is brighter, sharper and more detailed, more realistic in every way than even the best of today's TV sets. It achieves this in part through the use of twice as many scanning lines; the proportions of the image are also different. Many saw their first proof of its marked superiority on the demonstration sets displayed in key public locations here during the Seoul Olympic Games.

The American Federal Communications Commission (FCC) has acknowledged that the new technology is seminal and represents an opportunity for U.S. manufacturers to re-enter the consumer electronics field. But the American firms so far seem unwilling to take any great risk on HDTV, apparently deterred by the prospect of several years of large-scale financial outlays before profits begin to be generated. The corporate resources required will indeed be considerable since consumers may need persuading be-

fore switching from standard sets to expensive new equipment.

A refusal to develop and produce home-use HDTV units by U.S. manufacturers, however, will add to the American international trade deficit. In contrast, the Europeans — in both public and private sectors — have formed a consortium to develop systems for the new TV. Despite the competitiveness among them, U.S. firms perhaps should consider a similar move, something like the Sematech group venture now working on semiconductor technology.

Some American government officials apparently recognize the desirability of involving the public sector to help rejuvenate the U.S. consumer electronics industry through the new know-how. The question appears to be how to implement such a step.

Within another few years, Japan expects to have in orbit a pair of advanced broadcasting satellites, its BS-3 series, capable of sending HDTV signals throughout the Japanese islands. The new television also will make use of fiber optic and other associated electronic systems, especially for transmission to cable networks in urban areas.

Although both the U.S. and Europe have decided against direct adoption of the NHK Muse format for their own HDTV systems, our major electronics product manufacturers will, of course, be able to produce sets and related equipment for any market. They are aware, for instance, that receiving sets for HDTV-based systems will probably also be utilized in the future as computer screens and will have further uses beyond merely conveying entertainment, sports and news programs.

The electronics industry throughout the world is, of course, increasingly aware of the many opportunities that HDTV will present for supplying state-of-the-art components of all kinds. We will watch with growing interest whether the U.S. and Europe do indeed develop their own technologies for the new television and thus contribute to a reduction in trade friction in the global consumer electronics business or elect to use equipment produced abroad.

Asahi Evening News 8 Nov 73  
Mainichi Daily News \_\_\_\_\_  
Japan Times \_\_\_\_\_  
Daily Yomiuri \_\_\_\_\_  
Japan Economic Journal \_\_\_\_\_  
Jiji Press \_\_\_\_\_  
Kyodo Press \_\_\_\_\_

## High-Definition TV Broadcasts Scheduled to Begin Next April

Japan Broadcasting Corp. (NHK) will begin experimental broadcasting of high-definition television (HDTV)—which provides far sharper images than conventional TV—in April, 20 months ahead of schedule.

Few ordinary Japanese will be able to benefit from the increased quality of the broadcasts, however, unless they go to community centers in 40 to 50 cities where NHK plans to locate special TVs capable of showing the improved images provided by the system, called Hi-Vision. Such TVs now cost ¥70 million.

NHK said it decided to move up the start of its Hi-Vision broadcasts, which are transmitted by satellite, because of the success of demonstration broadcasts conducted during the Seoul Olympics.

The 1 million Japanese households with satellite re-

ceivers will be able to receive the Hi-Vision broadcasts, but only after spending ¥100,000 for a special converter. Even then, such viewers will not receive a better picture than they would with conventional broadcasts.

"I wouldn't treat this as anything really innovative or as being a big jump," said Yoshiko Hara, managing editor of the Japanese Industry Newsletter, an electronics industry trade publication. "This is just one stop along the way."

The decision by NHK comes after several setbacks in the United States and Europe to its hopes that Hi-Vision will be adopted as an international standard for HDTV. Europe is moving forward with its own HDTV system and the U.S. Federal Communications Commission has recommended that whatever system the United States adopts be compatible

with existing terrestrial broadcasting systems. Hi-Vision must be broadcast by satellite for its full benefits to be realized.

A spokesman for one TV manufacturer said NHK may have moved up its Hi-Vision broadcasts in an effort to promote the system overseas. No other country has begun HDTV broadcasts.

Conventional TV images are composed of 350 to 525 separate lines. Images broadcast using Hi-Vision are much sharper and clearer because they are made up of 1,125 lines. The quality of Hi-Vision pictures has been compared to that of 35 mm film.

—Asahi News Service

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Mainichi Daily News 10 NOV 78  
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Daily Yomiuri \_\_\_\_\_  
Japan Economic Journal \_\_\_\_\_  
Jiji Press \_\_\_\_\_  
Kyodo Press \_\_\_\_\_

# Japan Pushing HDTV Technology For World Use

By Hidesuke Nagashima  
Kyodo News Service

Japan is pushing its own high-definition television (HDTV) technologies for adoption as a common international standard amid an intense "battle of formats" with the United States and Western Europe.

HDTV is designed to show on a wide screen much sharper and more detailed television pictures than the current systems.

The outlook for international standardization of HDTV formats is far from clear, however, as Japan, the U.S. and the European Community (EC) are each developing their own technologies.

Despite some recent setbacks, the Japanese government continues to plug the home-developed HDTV system for global use. The Ministry of Posts and Telecommunications is coordinating efforts for promotion of the Japanese "Hi Vision" system, developed under the leadership of the Japan Broadcasting Corp. (NHK).

Japanese officials say Hi Vision, based on the "MUSE" broadcast standard, is the most technically advanced among the proposed HDTV technologies.

Japan, running well ahead of the U.S. and the EC in developing HDTV, plans to start transmitting HDTV programs by a satellite to be orbited in 1990.

The EC's proposed HDTV system, known as HD-MAC, will also use a satellite, while sever-

## Leading Edge

## 技術

al different U.S. HDTV versions being developed all center on ground-based broadcasts.

Efforts for international unification of formats for the new generation of television have so far been unsuccessful. The Consultative Committee on International Radio (CCIR), in a 1986 meeting on unifying HDTV formats, failed to reach agreement and deferred a decision on the question until 1990.

The U.S. Federal Communications Commission (FCC) in September made a preliminary ruling that favored U.S. HDTV technologies over the Japanese-developed system. Japanese and EC officials attending a London conference, meanwhile, failed to reach agreement on unifying HDTV formats.

The FCC guidelines would require broadcasters to transmit high-definition signals at the currently used TV frequencies from earth-based stations so that conventional TV sets would not become obsolete. Consumers, however, would have to buy a new receiver to see a high-definition picture.

Japan's satellite-based MUSE Hi Vision system in itself is not compatible with the FCC guidelines calling for ground-based transmissions. The Japanese government contends, however,

that the FCC decision does not exclude Japan from the U.S. market.

"The decision by no means rules out Japanese technologies because Japan has also proposed the "MUSE Family advanced television system which is compatible with the preliminary FCC specifications," said Katsumi Osuga, director of the Hi Vision Promotion Office at the Ministry of Posts and Telecommunications.

The system would have high-definition signals nestling inside conventional earth-transmitted TV signals so that any TV set could receive HDTV broadcasts.

Osuga also said the FCC decision concerns only a transmission standard, which must be considered separately from a studio production standard.

He noted that the American National Standards Institute (ANSI) recently approved Hi Vision for studio applications, adding, "That was highly encouraging for Japan." The standard is not binding and does not exclude other high-definition systems. The ANSI had been considering an application by U.S. film makers for using the Japanese system which has advantages in speed, ease of editing and adaptability to special effects.

Japanese manufacturers are also ready to enter the global HDTV market, regardless of the outcome of the battle of formats.

"We are technically ready to deal with any format that may be adopted overseas," said Sony Corp. spokesman Koichi Yuzukura. "We have not made any specific production plans for HDTV equipment, though, pending decisions on HDTV formats overseas."

Other companies such as Matsushita Electric Industrial Co., the home electronics giant marketing under the "Panasonic" brand, also say they are ready to meet different HDTV specifications that may be adopted in the U.S. or the EC.

For the Japanese market, the manufacturers are gearing up to build MUSE-compatible TV sets, videocassette recorders and videodisk players.

One major problem in developing HDTV is the cost of the receiver. At present, a MUSE-compatible receiver would cost about 10 million yen, but both the government and manufacturers hope that the price will eventually be lowered to about 500,000 yen through mass production.

The outcome of the international competition over HDTV is critical for the global electronics industry. At stake are potential HDTV sales estimated to grow to 40 billion dollars a year worldwide in the next decade.

HDTV is also expected to have a major "ripple effect" on high

Asahi Evening News \_\_\_\_\_  
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technology such as memory chips, software, television broadcasting, medical and military imaging, printing, movie making and computer digital image-processing.

Some industry estimates show that HDTV sets for home and industrial use will generate 400 billion yen worth of new business a year in Japan alone for the semiconductor industry by the year 2000.

HDTV development began in the 1960s, when NHK engineers started developing a state-of-the-art system in hopes of unifying the world's TV systems into a single standard.

NHK gave up compatibility with current TV equipment because of the technical limitations of the present systems.

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Asahi Evening News \_\_\_\_\_  
Mainichi Daily News \_\_\_\_\_  
Japan Times \_\_\_\_\_  
Daily Yomiuri \_\_\_\_\_  
Japan Economic Journal 3 Dec \_\_\_\_\_  
Jiji Press \_\_\_\_\_  
Kyodo Press \_\_\_\_\_

**NTT to unveil unit  
for HDTV transmission**

Nippon Telegraph & Telephone Corp. will unveil an optical-fiber cable system for ground-based transmission of high-definition television video signals. The telecommunications giant will also experiment with long-distance transmission for the first time using the system.

NTT sources claim that the system, which it developed jointly with NEC Corp., is capable of sending HDTV videos with the world's most efficient transmission.

The system adopts a unique signal compression method to send HDTV videos at a transmission rate of only 100 megabits per second — one-twelfth the amount needed without the signal compressor, the sources said. One megabit equals one million bits.

(The NIKKEI-M, Nov. 19, P8)

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Mainichi Daily News \_\_\_\_\_  
Japan Times \_\_\_\_\_  
Daily Yomiuri \_\_\_\_\_  
Japan Economic Journal 24 Dec  
Jiji Press \_\_\_\_\_  
Kyodo Press \_\_\_\_\_ P35

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**NHK, European firms  
meet to talk HDTV**

Japan Broadcasting Corp. (NHK) is expected to discuss standards for high-definition television with N.V. Philips' Gloeilampenfabrieken of the Netherlands and Thomson S.A. of France for the first time, meeting in Paris in January 1989.

The Japanese broadcasting company and European TV manufacturers, led by Philips and Thomson, hold differing views on standards for HDTV. A special meeting of the international radio-communications consultative committee will be held next May to discuss HDTV standards.

(The NIKKEI-M, Dec. 12, P9)

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# Commercial TV readying better-quality images; costs, technical snags may delay NHK Hi-Vision

By TAKASHI KITAZUME  
STAFF WRITER

1989 is expected to bring an added dimension to the world of television broadcasting, but there are still several kinks to be worked out in high-definition television (HDTV), and it will be several years before it becomes a familiar household item.

The nation's commercial broadcasters and the publicly-owned NHK (Japan Broadcasting Corp.) have each developed a different method of improving the picture and sound quality of TV broadcasts.

Extended-definition television (EDTV or, as the commercial broadcasters call it, Clear-Vision), is an extended form of the broadcasting method used in Japan and the U.S. today. Clear-Vision broadcasts are scheduled to start this summer.

The system is compatible with the current one. An EDTV program can thus be watched on a conventional television set, although a large portion of the improvement in picture quality is attained only on a new EDTV receiver.

## Higher resolution

Under the current broadcasting format, only half the 525 scanning lines are actually indicated on the display of a conventional TV receiver. But an EDTV receiver shows each of the 525 lines, so the viewer can enjoy flicker-free pictures with higher resolution, according to Shunichiro Kudo, deputy chief of the planning division of the National Association of Commercial Broadcasters in Japan.

In addition to upgrading cameras and other studio equipment, broadcasters will insert a ghost-canceler signal into their programs, which receivers will process to eliminate ghost images, he said.

High-Vision, the high-definition television (HDTV) system developed by NHK, is based on a format not compatible with the current broadcasting system. A High-Vision program can be seen on a conventional TV set equipped with a converter, but only at the expense of most of the improvements in picture quality.

## Satellite transmission

Unlike programs broadcast under the current system — which is called NTSC, after the United States' National Television System Committee — or those for EDTV, Hi-Vision programs will be transmitted from broadcasting satellites.

Hi-Vision has 1,125 scanning lines, more than double the number for NTSC, and the aspect ratio (ratio of width versus height of a TV display) will expand from the NTSC's 4:3 to 16:9, according to Genichi Hashimoto, deputy director of NHK's public relations bureau.

The amount of information carried on a Hi-Vision picture will be five times that of an NTSC picture, and the quality will almost equal that of 35mm movies, he said. The expansion of the aspect ratio will also mean a wider perspective and greater presence for viewers, he said.

NHK has already given many public demonstrations of Hi-Vision broadcasting, including the live coverage of the Seoul Olympic Games seen on displays placed in the streets last fall.

It plans to start experimental broadcasts on a daily basis in April, about a year earlier than originally planned. Regular broadcasting is expected to start sometime in 1990, after the launching of Broadcasting Satellite 3, according to Hashimoto.

These developments, of course, are expected to bring new opportunities for the nation's electronic industry as a whole and help it offer products with higher profit margins.

## Limitations visible

In fact, the EDTV project arises partly from the frustration of TV set makers. Even if they want to sell large-screen sets, an enhanced display would only reveal the limitations of conventional TV broadcasting, according to Kudo of NACB.

Encouraged by the recent increasing demand for large-display TVs, Japan's leading consumer electronics manufacturers have begun marketing such sets designed to receive EDTV broadcasts. They expect the system to expand further the market for large-screen sets.

The introduction of EDTV programs will also help boost sales of higher-quality videotape recorders such as the Super-VHS machines, Kudo said.

The more sophisticated picture-processing technology of HDTV opens a huge potential for suppliers of high-tech components and devices, especially the very-large-scale-integration (VLSI) memory chips needed for the new receivers.

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 Kyodo Press \_\_\_\_\_

TV, he said.

The spread of Hi-Vision, NHK's Hashimoto said, depends on the development of a low-cost HDTV set and a steady supply of HDTV programs that showcase it.

At present, a Hi-Vision receiver set is said to cost about ¥20 million. In addition, it is still too heavy, bulky and electricity-consuming to be brought into the ordinary Japanese house, Hashimoto admitted.

These problems can be solved by replacing the complicated circuits in the current Hi-Vision receiver with VLSI chips as much as possible, he said. A technological breakthrough in the development of a much thinner display, using either liquid crystals or plasma, would solve the problem of space, and the per-unit cost will decline as production scale rises, he added.

**Consumer debut**

NHK and the Ministry of Posts and Telecommunications expect that the first consumer-use Hi-Vision receiver will be marketed as early as 1990 at a price of ¥500,000. However, many observers, including set makers, suspect that they are being too optimistic.

Moreover, introducing Hi-Vision represents an enormous investment for broadcasting companies, perhaps of tens of billions of yen. Existing video cameras and other studio equipment will have to be replaced with HDTV-format equipment costing roughly twice as much as conventional machines.

"A commercial broadcasting company will not dare to make such investments unless it is completely assured that Hi-Vision is a paying business," Kudo of NACB said.

**Industry repercussions**

The effects of HDTV on related electronic industries are illustrated in a recent report by the American Electronics Association. It concluded that a delay in the development of HDTV will substantially reduce U.S. manufacturers' share in such high-tech fields as personal computers and semiconductors.

This is the reason, industry sources say, that European and American electronics companies are resisting a global standardization of HDTV formats based on Japan's Hi-Vision system — they fear it would lead to domination of the world HDTV market by Japanese suppliers.

The question is how soon these new broadcasting methods will take root.

EDTV sets so far cost nearly twice as much as conventional TV sets with screens of the same size. This is chiefly due to the increased use of memory chips, and the price gap will shrink as the chips become cheaper through mass production, Kudo said.

**EDTV phased in**

Starting in the summer, commercial broadcasters will air a few hours of EDTV each day and gradually replace NTSC programs with EDTV as they replaced black-and-white broadcasts with color

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Breakthrough May Let Japan Go Own Way in HDTV

Japanese R&D on high definition television (HDTV) has reached a state where drastic reductions in receiver prices are likely in about two years. The prospect may tempt Japan to implement HDTV earlier than originally anticipated.

Last month, Nihon Hoso Kyokai (Japan Broadcasting Corp., or NHK) and six electronics manufacturers -- NEC, Matsushita Electric Industrial, Toshiba, Sony, Hitachi, and Sharp -- jointly developed signal decoding large-scale integration (LSI) chips, which will cut the size and cost of HDTV receiver sets by reducing the number of components in the televisions. Lower-priced HDTV sets, in turn, will stimulate customers' interest, leading to higher output, mass production, economies of scale, and therefore further price reductions.

The satellite signal decoder used with HDTVs has been the major roadblock in pricing. Today it takes up an area the size of a bookcase because the decoder has to contain more than 1,000 integrated circuits (ICs). The equipment restores highly data-compressed signals from satellites and is expected -- in its present form -- to cost about \$80,000 per unit.

The breakthrough will permit replacing these ICs with less than 100 new LSI chips, thus reducing the size of a decoder to one-tenth of the space taken by a bookcase. The six manufacturers are evaluating performances of the LSI chips and are starting to build experimental decoders for completion by June.

If they succeed, they will add to the level of integration of the circuits so as to build receiver sets with built-in decoders. Then the price of an HDTV with 30-inch display will be set at about \$4,000, which is the amount for which both Japan's Ministry of Posts and Telecommunications and NHK are aiming.

Last year, the Japanese encountered resistance to their proposals for HDTV technical standards from the United States and Western Europe. Japanese perceive that these nations fear being left behind in the race for state-of-the-art technology.

If Japanese HDTV makers were unable to penetrate foreign markets because of differing TV standards, they still probably would produce the sets because of the many spinoffs likely to be obtained from the technology.

- Asahi Evening News \_\_\_\_\_
- Mainichi Daily News \_\_\_\_\_
- Japan Times \_\_\_\_\_
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The technology can be readily applied to movie-making, printing, or the defense industry because of the high quality of picture reproduction. Though the implications of using HDTV technology for defense have not been widely discussed, the new, higher quality image-sensing and display technologies are viewed as prime candidates for transfer to military applications.

Not only will these technologies provide new, solid markets for advanced microchips, displays, and other peripherals, but they will offer growing business for electronics makers in general. The replacement of the world's (or even Japan's) stock of conventional televisions with the advanced HDTV models will involve expenditures of billions of dollars.

More importantly for firms like NEC, Fujitsu, and Mitsubishi Electric, HDTV provides new opportunities to enter the home TV market. These "drab" companies, despite their advanced technology in satellite communications fields, have so far failed to make a dent in TV and other home appliance markets.

Already, NEC Home Electronics and Fujitsu General have been competing in Japan's budding satellite broadcast market, with each securing a 30 percent market share among the 1.25 million dishes already installed. Observers point out that these two companies are active in the business not because of the current sales level -- 40,000 to 50,000 units per month -- but because of the prospect of HDTV in a few years.

"Showing their [colors] and gaining customer recognition are all that they are after," an observer said.

With bright market prospects and strong corporate backing, the introduction of HDTV in Japan appears to be a matter of when rather than whether.