

Current State of Japanese HDTV

By Omori Yukio

"As of November 15, we will offer 28-inch high-definition television receivers for ¥650,000. Current production is 3,000 units per month." Sony's September 6th announcement came as a shock, heralding a new stage in the diffusion of high-definition television (HDTV) systems. HDTV was pioneered in Japan, and many speculated that it will lead the next generation of television systems as it is the only one in the world to be used commercially so far.

Other consumer electronics makers were startled and wondered how the product could be profitable at such a low price. On July 15, 1992, Sony had created another industry sensation when it introduced a 32-inch HDTV set priced at ¥1,300,000, this just before the Barcelona Olympics. At that time as well, newspapers reported comments from competitors such as, "Can this be profitable? We are surprised. Sony has begun to challenge us seriously, utilizing its ample funds and expertise. But we cannot just sit around and do nothing." Considering that it was only one year later that Sony cut the price in half, their competitors' bewilderment seems natural.

When HDTV sets were first put on the market in 1989-90, they were priced at more than ¥4 million. They were viewed more like a prized accessory for the manufacturer which proudly labeled them "handmade products like a high-class sedan." About 300 units were owned by companies and only a handful of maniac consumers were interested in NHK's (Japan Broadcasting Corporation) experimental high-vision broadcast. In November 1991, new experimental high-vision broadcasts were launched by the High-Vision Promotion Association via satellite. In hopes of stimulating consumer interest, eight hours of programming were run daily, but at the time a Sony HDTV set cost ¥3.2 million, beyond the reach of most people.

The 1992 Winter and Summer

Olympics in Albertville and Barcelona provided an opportunity to lower costs dramatically and resulted in the aforementioned Sony 32-inch receiver. It was a full-scale model as opposed to the simplified ones which omitted the core multiple sub-nyquist sampling encoding (MUSE) decoder. This triggered an industry price war around the ¥1 million mark. The cheapest model was JVC's 32-inch model priced at ¥850,000 and Sharp offered a simplified model at ¥700,000 but with inferior picture quality. Since experimental broadcasting began two years ago, both makers and the broadcast industry alike have been chanting a mantra of "double millions" meaning ¥1,000,000 receivers and 1,000,000 high-vision subscribers as the diffusion benchmark. In contrast, the Ministry of Posts and Telecommunication (MPT) has stated, "Diffusion of HDTV systems should take off when receiver prices fall to ¥500,000."

There are reasons for the ¥1 million price target. Color TV sales suddenly took off during the late 1960s after the price was dropped to ¥200,000. At the time this was about five times the average starting monthly salary for university graduate office workers. Based on this precedent, the current equivalent is about ¥1 million, considering the average starting salary for a freshman office worker was about ¥190,000 per month last year. When this price is achieved, a million subscriptions should become attainable.

Owing to the cost cutting competition triggered by the Barcelona Olympics, about 10,000 HDTV sets were sold in the fiscal year ending March 1993. According to a May 1993 MPT document, there were about 7.01 million satellite broadcast subscribers including about 5.02 million NHK subscribers at that time. This illustrates how Olympic fever helped boost the number of subscribers and, compared to this, 10,000 high-vision subscribers pales considerably.

The reason for so few subscribers is the limited amount of high-vision programming. Experimental broadcasting only runs from 1:00 to 9:00 p.m. as opposed to the full-time satellite broadcasts by the two NHK channels and the independent WOWOW channel. In addition, the current recession has chilled consumers who feel ¥1 million is still too expensive. But now that Sony introduced a fullspec receiver at ¥650,000, ¥500,000 has become a more feasible target and price competition will likely accelerate diffusion with an estimated 170,000 units as of September 1993. The Japan Electronic Industries Association has made the following bullish statement: "We estimate diffusion will reach 30,000 units by the end of 1993 and at least 50,000 units will be sold in 1994. This forecast can easily be surpassed as the Lillehammer Winter Olympics approach."

The new Sony model has BS (broadcast satellite) and CS (communication satellite) tuners and can receive regular TV programs. As the receiver has a wide screen with a width of 57 cm and length of 32 cm (16:9), its ¥650,000 price tag may not be considered expensive compared to ¥300,000 to ¥400,000 for normal wide screen TVs, which are currently very popular.

Sony has clearly been the leading company in the HDTV hardware business for the initial two years. In August 1991, Sony, Fujitsu and Hitachi formed a joint venture with Texas Instruments, a major U.S. semiconductor manufacturer, to develop new semiconductors for NHK MUSE HDTV system receivers (dubbed high-vision by NHK in 1985). This joint venture is aimed at reducing receiver costs by using fewer semicon chips through the development of higher density semiconductors under the auspices of consumer electronics and semiconductor makers. This yielded a second generation large-scale integration circuit, which allowed for Sony's successive ¥1.3 million TV and

¥650,000 sets. Sony also used its expertise to revise whole parts and reduce the base size to the equivalent of a conventional 29-inch TV set, a more suitable size for Japan's housing situation.

Attempts to unify international standards for HDTV have failed. Thus there are three different HDTV systems, in Japan, the U.S. and Europe. While both the European HD-MAC and U.S. digital advanced television systems are still under development, Japan's MUSE system is already commercialized. With its new broadcast satellite BS-4 scheduled to come on-line after further testing, NHK made the following official announcement: "We will shift our satellite broadcast entirely to high-vision when receivers are fully diffused." If this happens, HDTV should be central to audio maker's strategy into the 21st century. Surely, Sony won't be allowed to keep running ahead of the pack and severe price wars seem certain for late 1993 and 1994 with makers prepared to take losses.

It should be noted that Sony has already set up Sony Pictures after absorbing Columbia Pictures and is try-

ing to cooperate with other software companies. It is not just a coincidence that Matsushita Electric Industry bought the U.S. filmmaker MCA, and the president of JSB (the WOWOW station), who has been buying a vast number of films, is from Matsushita. The anticipated multimedia era, including HDTV, BSTV, CSTV and conventional surface broadcast systems, may allow the consumer electronics companies swollen with accumulated expertise and software to seize a large share of the HDTV market.

High-vision already commercialized

People want more dynamic and clear TV pictures and engineers have worked diligently to facilitate this. After the successful shift from black and white to color, TV naturally advanced towards HDTV. NHK started high-vision development immediately after the 1964 Tokyo Olympics. From the beginning, the use of satellites was envisioned due to the limitations of wave bands. Having developed the MUSE system,

which squeezes the band area to be included into satellite channels, NHK MUSE high-vision system hardware was tested at the 1984 Los Angeles Olympics, at the 1985 Tsukuba EXPO and finally reached the stage of broadcast testing via the satellite BS-2b in 1986.

The first live usage in reporting the 1988 Seoul Olympics turned the public gaze to "Nobel prize worth" technology for the first time. The system has 1,125 scanning lines compared to 525 in regular broadcasting. In reference to this number, the MPT and related industries established November 25 as High-Vision Day. This was a conscious celebration of the world's first and most developed HDTV system. The ministry set regulations for the high-vision MUSE system in 1991 and on November 25th that year, the High-Vision Promotion Association was formed to begin experimental broadcasts eight hours a day via BS-3b satellite.

This new vision system was developed with maximum size considerations. A receiver has the screen propor-

tion of 9:16 (conventional television is 3:4). The most appropriate viewing distance is three times the height of the screen (conventional system seven times), the viewing angle is 30 degrees (conventional system 10 degrees) and voice signal is PCM pulse code modulation (conventional system FM). The new system carries five times more information than the conventional system and provides more comforts both psychological and biological as well as a sense of actually being there. To make image exchanges with the conventional system easier, the number of scanning lines is 1,125



HDTV offers the enjoyment of wide-screen, movie theater style viewing at home. Will this trend be a repetition of what Panavision did to the film world?

as this is a simple integral multiple of the scanning lines of the NTSC, phase alternation line (PAL) and système électronique couleur avec mémoire (SECAM) systems. Regarding voice signals, the digital pulse coded modulation system, which is regarded as the ultimate voice system, was employed.

The high-vision system is expected to emerge victorious among next generation TV systems. Its highly elaborate image performance becomes ever more evident in static areas. Because of this, the potential for non-broadcasting, industrial usage is wide open. Potential areas of usage include medicine, image printing, special composition for movie making, art and academia. There are several "High-Vision Museum" system projects now underway in Japan.

Thus MPT and MITI have been fighting over high-vision leadership in anticipation of the 21 century's era of information and images. However, this typical Japanese bureaucratic territorial fight has subsided and is shifting toward a concerted response to international competition vis-à-vis U.S. digital HDTV and European HD-MAC. These three HDTV systems, MUSE, digital HDTV and HD-MAC are all internationally recognized, but the attempt to unite them into a single world standard failed. This is similar to the three different standards in conventional TV systems—NTSC, PAL and SECAM, each of which respond to specific national conditions and their regional backgrounds.

The U.S. plans to abolish all surface analog TV by 2008 and shift to a digital system. Its own digital HDTV system is scheduled to begin in 1999. Due to its ethnic and linguistic diversity, the U.S. has a clear need to amplify the number of channels. Thus the government has taken leadership in promoting a digital system as this allows waves to be divided. Europe, on the other hand, employed its own HD-MAC system in relation to EC unification and out of fear that its market would be dominated by Japanese and U.S. electronics manufacturers.

However, as I said before, Japanese HDTV, which is already shifting from

commercialization to dissemination, is considered more than five years ahead of other systems. Both the U.S. and Europe have barely entered the experimental stage from paper planning. Of course, there is a possibility that the digital system will become dominant in the next century. But it is wrong to say that high-vision will be isolated from the rest of the world because studio standards for high-vision are digitalized and it is only the communication system standard that employs analog waves. NHK has already declared its commitment to "promote high-vision broadcasting via BS-4 satellite and when receivers are diffused, we will shift all satellite broadcasting to high-vision." The MPT also officially announced its support for this and private networks are following suit. BSTV, which currently uses the 12GHz band, will be able to use the 21GHz band starting with the BS-5 satellite due to be launched in 2007. This will open the full-scale digital era. Anticipating this as well as introducing integrated digital broadcasting, NHK believes "there should be no problem keeping the high-vision system, which is the only established and stable one in the world. Further, digitalization will not pose a problem."

Hardware ahead of software

The MPT decided to reserve one wave band as a high-vision diffusion channel for the BS-4 satellite to be launched in 1997. The undertaking and practical parameters of the scheme should be fixed by the end of 1993, but it is expected that to fully operate this channel, NHK and other satellite TV will commence satellite broadcasting in a way that "mixes high-vision and NTSC system programming" after 1998. When the satellite broadcasting system becomes widespread through lower priced receivers and attractive software programs, there will be a basic job division with 1,125 line high-vision TVs utilized for satellite broadcasts and conventional 525 line TVs for surface broadcasts. MITI forecasted in July

1993 that by the year 2000, high-vision demands would be about ¥1 trillion. By then, diffusion of high-vision TV sets is expected to be between 5 and 7 million units. But, according to the ministry, this estimate is "conservative compared to private sector estimates and could be revised." Private sector estimates are bullish "at around ¥5 trillion including related business."

As I illustrated in detail above, regarding hardware, the appearance of a 28-inch fullspec receiver priced at ¥650,000 has encouraged the MPT, NHK and the Hi-Vision Promotion Association, and forced private broadcasters, which have been sitting on the fence, to recognize that there's no alternative: high-vision is coming and should be considered indispensable to participate in satellite broadcasting via BS-4 satellite. However, for the consumer, the question is, "Aren't prices going to fall further? Although the current prices are affordable, current programming is rather unattractive ..." Viewers have become accustomed to watching midnight shows, 24 hour broadcasting and funny programs. They won't be satisfied with experimental broadcasts running only eight hours a day, consisting of earnest and pedantic NHK programs and private stations' tentative programs emulating the NHK style. Moreover, newspapers do not list high-vision programs so people have no idea what is being shown.

For NHK, production costs for high-vision is about 30% higher than normal programs. For private stations, the cost is more like doubled or tripled, including labor costs. Also, there are no immediate returns as this is an investment in the future. Moreover, as high-vision is available only in Japan, they cannot buy software from abroad. Hardware is bounding ahead while software, both insufficient and underdeveloped, lags far behind. While this broad dream for the 21st century has been clearly outlined, there is a long road to travel before it becomes a reality. ■

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