

THE START OF DIGITAL TERRESTRIAL BROADCASTING IN JAPAN AND THE TRANSITION FROM ANALOG BROADCASTING TO DIGITAL BROADCASTING

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ABSTRACT

This document presents the digital transition schedule for terrestrial and satellite broadcasting, the current penetration status and trends of digital receivers in Japan, as well as a report on penetration promotion activities to encourage the transition from analog to digital service.

Penetration promotion activities involve cooperation, not only among broadcasters, but also between governmental authorities and receiver manufacturers, with the purpose of positively introducing a common receiver that can receive all the services from digital terrestrial broadcasting, digital BS satellite broadcasting, and 110-degree digital CS broadcasting using a single device.

INTRODUCTION

In December 2003, digital terrestrial broadcasting commenced its services in the three metropolitan areas of Tokyo, Osaka, and Nagoya. It provides Hi-Vision (HDTV) broadcasting and data broadcasting services, which were not available through analog terrestrial broadcasting. Digital BS satellite broadcasting started in December 2000, with a penetration into over 5 million households and still increasing.

At the same time, analog terrestrial broadcasting, which has been diffused to all households in Japan, and analog BS satellite broadcasting with a penetration rate of about 36% of households are scheduled to terminate their services by 2011. This means that, by 2011, the digitalization of all TV broadcasting, together with viewers' transition to digital receivers from their current analog receivers will have been completed.

This document introduces trends in services and receivers for digital broadcasting, and reports on activities in relation to the receiver diffusion promotion being carried out in collaboration with the government and receiver manufacturers, in preparation for full-digital service in 2011.

DIGITAL TRANSITION SCHEDULE

Figure 1 shows Japan's digital transition schedule for TV broadcasting. The digital terrestrial broadcasting that started in Tokyo/Osaka/Nagoya in December 2003 is scheduled to expand its services to other prefectural capitals by the end of 2006. Four cities among these have announced that digital services will start between October and December of 2004. Analog terrestrial service will end its broadcasting by 2011.

Digital BS satellite broadcasting has also already begun its services, since December 2000, with a scheduled service termination of its analog counterpart by 2011, the same as that of analog

terrestrial broadcasting. Analog HDTV broadcasting (Channel BS-9) in analog BS satellite broadcasts will end in 2007.

The target years are defined in the government’s radio regulations and all the related parties are encouraged to get together for the clear goal of complete digitalization.

There are two main purposes for the digitalization. The first is “maximum utilization of the precious frequency spectrum.” After the complete digital transition, conventional analog TV spectrums will be re-allocated for mobile communication uses to meet the increasing spectrum demand of the cellular phone systems, etc.

The second purpose is the “improvement of the IT infrastructure of every household.” Digital TV sets will become an easy-to-use information gateway even for the elderly, who normally stay away from PCs.

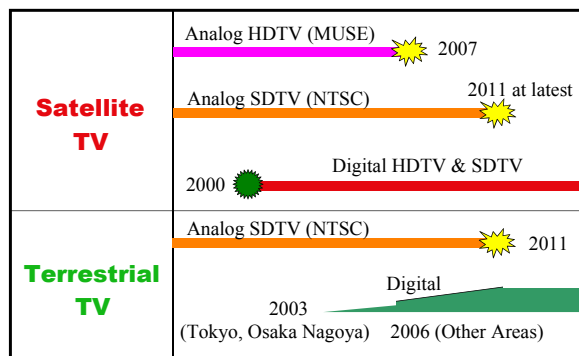


Figure 1 Digital transition schedule

HOUSEHOLD PENETRATION OF DIGITAL BROADCASTING SERVICES

Digital terrestrial broadcasting services started on December 1, 2003 and about 200,000 households had already subscribed to the new digital services by December 31, 2003.

Figure 2 shows the household penetration for digital BS satellite services. With the NTSC-converted subscribers through cable TV, 5.1 million households have already subscribed to the new services and the number of subscribers is increasing at a rate of 1 to 1.5 million a year.

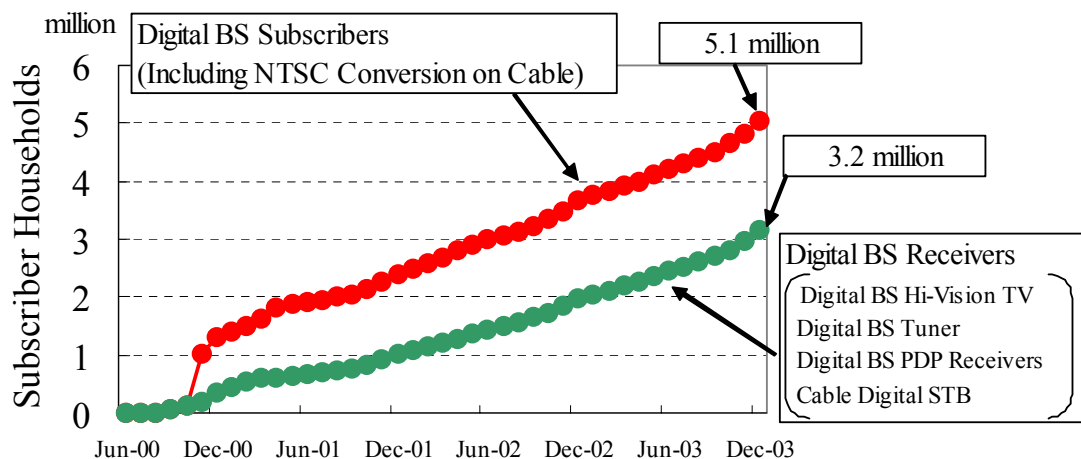


Figure 2 Penetration of digital satellite broadcasting

With the introduction of terrestrial-digital-ready TVs, all of which have satellite digital reception capabilities, the household penetration pace of satellite digital services is expected to increase radically and will approach the analog satellite penetration percentage (about 36%) in the near future.

DIGITAL BROADCASTING SERVICES

Both digital terrestrial broadcasting and digital BS satellite broadcasting feature high-quality picture HDTV service and high-function data services

Digital signal compression technology (high-efficiency coding technology) realized HDTV broadcasting within a single terrestrial broadcasting channel bandwidth (6MHz). Digital BS satellite broadcasting provides HDTV programming using its one channel bandwidth (34MHz).

It is also feasible to offer multi-view broadcasting, where up to three SDTV programs can be simultaneously transmitted over a single channel, instead of one HDTV program. An image of this multiple programming is shown in Figure 3. Figure 3 (a) describes a configuration with three standard resolution programs. Multi-view broadcasting with two SDTV programs transmitted at different bit rates is shown in (b).

Other possible options for multi-view broadcasting include provisional multi-view service, for those occasions where the length of a program, such as a live relay broadcast, is extended. Provisional multi-view broadcasting would allow both the extended program and the scheduled program to be broadcast simultaneously. Another option for multi-view broadcasting is multi-view, which allows a viewer to watch a program within a program, with one picture inset in the other.

Data broadcasting realizes services through which viewers can access desired information at anytime. The data service for digital terrestrial broadcasting is especially capable of providing closely-localized information, for individual broadcasting stations can dispatch separate pieces of data.

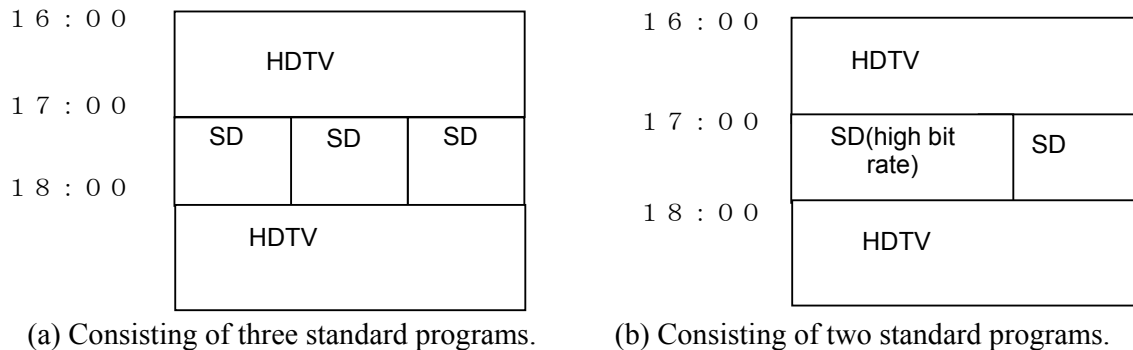


Figure 3 Multi-view broadcasting formations

TRENDS IN DIGITAL TV RECEIVERS

Table 1 shows the new digital TV models already in the market. The new models are rapidly

shifting from the conventional “BOX” to new flat “PANEL” types. The new HDTV services push the potential demand for “more definition, a larger screen, and more presence in less room,” which could not be realized with conventional CRT TVs.

All these new models are clearly different from the previous models. The newcomers are “all-digital-compatible,” which means they are compatible not only with the satellite digital services (PSK) but also with the terrestrial digital services (OFDM). Considering the already-defined closing year of analog services, these new “all-digital-compatible” TVs will be the new standard in Japanese TV market. The Japanese government’s digitalization policy may trigger an explosive growth in the digital TV market.

Type	Manufacturers	Models
CRT	4	13
PDP	5	21
LCD	6	15
STB	5	6
Total	7	55

Table 1 Digital TV receiver models.

DIGITAL TERRESTRIAL BROADCASTING FREQUENCY ALLOCATION

Channel Re-Allocation Of Analog Terrestrial Broadcasting

The new services are scheduled to be introduced step-by-step from urban areas to rural areas and are expected to provide nationwide coverage within the first decade of this century.

This “phased introduction scheme” has been employed because of the very crowded nature of Japanese TV broadcasting frequency allocation. The conventional analog services occupy almost all the allocatable frequency spectrum because Japan is a very mountainous country that requires many

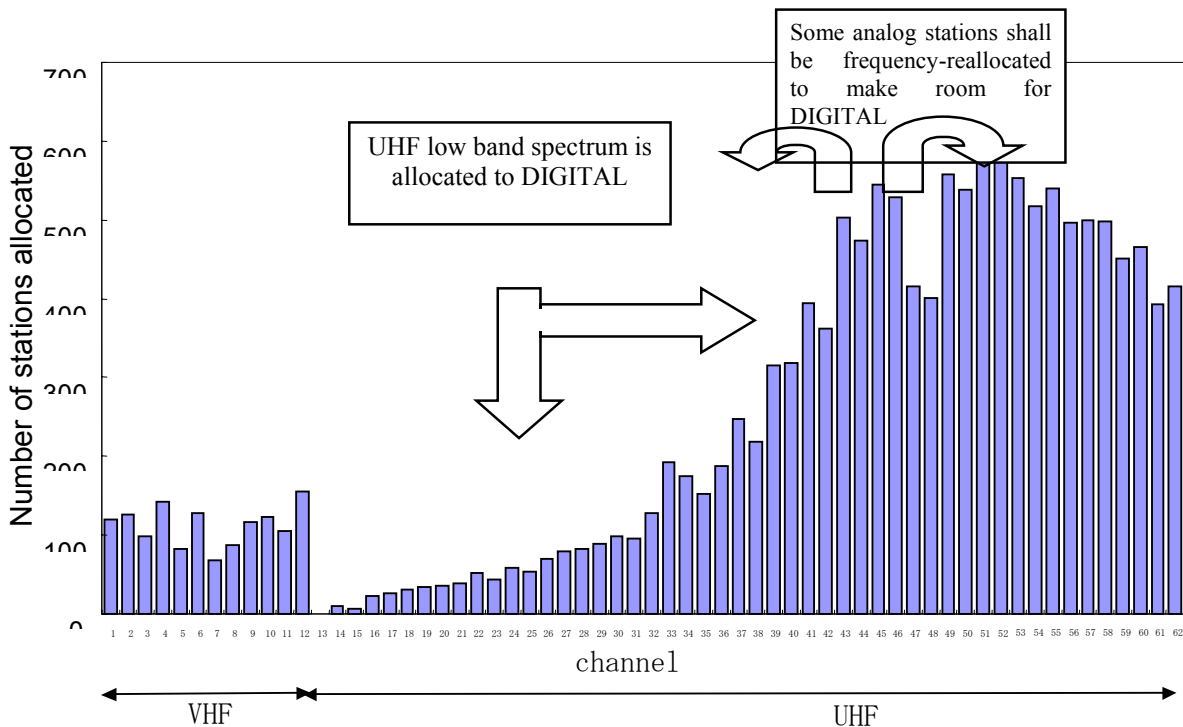


Figure 4 TV channel allocations and reallocation scheme

small relay stations to provide nationwide coverage.

Due to this very tight frequency usage, some analog stations must be frequency-reallocated before the new digital services can begin.

This frequency reallocation process for the existing analog TV sites is called “Analog to Analog Channel Reallocation.”

NHK alone has licensed more than 7,000 TV channels in the VHF and UHF frequency bands.

Figure 4 shows the current channel usage of VHF and UHF bands and the basic policy of the scheduled frequency reallocation for analog TV.

	Aug. 2002 Plan
To be reallocated	801 transmission sites
Target Stations' Coverage (Cable TV build-out)	About 4.26 million households (0.13 million households)
Estimated Budget	180 billion Yen (Abt. US\$ 1,500 million)

Table 2 Frequency Reallocation Plan for analog TV

In the current channel reallocation plan, more than 800 transmission sites are on the list and the coverage area of these target sites is estimated to be over 4 million households (Table 2).

To realize this channel reallocation plan, which is on an unprecedented scale, intensive measurements of TV signal strength throughout the country were carried out and every possible type of analog-to-analog, analog-to-digital, digital-to-analog, and digital-to-digital interference was thoroughly investigated.

The planned countermeasures include door-to-door visit-and-channel-preset of subscribers' TV sets, reception antenna exchanges and cable build-outs.

The channel reallocation work is scheduled to be completed in 2009, two years before the digital transition is completed.

Analog Channel Reallocation On The Frontline

Because the digitalization of terrestrial TV broadcasting is a national policy, the associated analog TV channel reallocation work is being carried out by the government.

On the frontline, this channel reallocation work is no easy task. When the destination channels (new channels) begin broadcasting, all TV sets and VCRs have to be readjusted to tune in the new channels in rather a short period of time (a few days to a few months) before the old channels are shut down.

For example, the channel reallocation

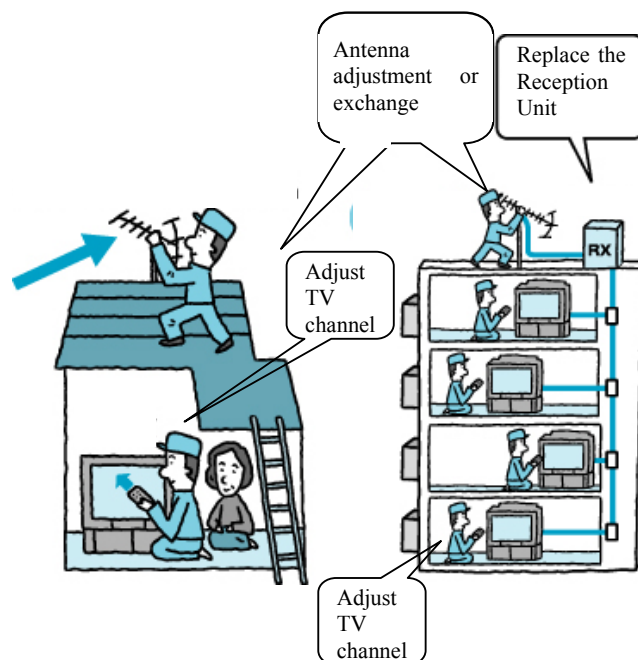


Figure 5 Analog TV channel reallocation work

work for the Hachioji area (the suburbs of the Tokyo metropolitan area) took about 4 months and required thousands of man-days to complete the TV channel readjustment work for about 45,000 household subscribers.

PROMOTION ACTIVITIES

Digital TV Promotion Campaign

For a successful launch and steady subscriber penetration progress for the newly introduced broadcast media, the efforts of broadcasters alone are not enough.

If receiver manufacturers fail to produce reasonably priced reception equipment by the starting date, the media will fail to make a boom.

If commonly used reception systems are not compatible with the new service and subscribers don't know how to upgrade their systems, subscribers will look for another information or entertainment source that is easier to reach.

If receiver retailers don't have detailed technical information on the media, they will not be eager to sell the new products and the media penetration pace would be hampered.

To avoid these undesirable situations, we are cooperating closely with the related industries and parties, including governmental authorities, TV manufacturers, and retailers. Through this close relationship, technical information on the media is provided to all the major manufacturers, retailers, and also directly to consumers.

We are convening nationwide technology workshops for the new broadcast media. Each year, more than 50,000 electronics retailer technicians attend the workshop and learn state-of-the-art digital broadcast technologies.

These steady activities make up a technological base for the media's strong growth and create a reputation for the media among consumers.

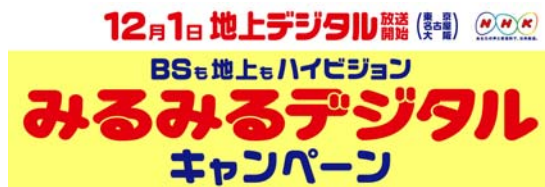


Figure 6 2003 DTV Promotion Campaign banner

One of the examples of such cooperative activities with related industries introduced here is the 2003 DTV Promotion Campaign carried out between October and December 2003. NHK presented a campaign symbol banner in its broadcasting spots (Figure 6).

This symbol banner appeared everywhere in town, at the entrance of retailers, at manufacturers' new model exhibition sites, trade shows, etc.

The symbol banner meant that interested consumers could get detailed information at the places where the



Figure 7 CEATEC 2003 JEITA/NHK Exhibition booth

banner was hung.

Placing these “info-kiosks” nationwide helped consumers to get detailed information on the digital media’s technology and the new services.

In the same campaign period, we advertised DTV at the CEATEC 2003 exhibition (Figure 7) and manufacturers intensively advertised their new receivers in papers and magazines. They also set kickbacks on their digital TVs for retailers. This accelerated the price reduction of the TVs and encouraged retailers’ sales.

Technical Seminar

To achieve further receiver penetration, it is indispensable that electronics retailers, which most frequently have direct contact with viewers, acquire accurate information on digitalization and technical expertise in relation to reception. For this reason, NHK is holding frequent seminars and lectures in cooperation with receiver and antenna manufacturers, in addition to compiling reference materials for receiving systems.

As shown in Table 3, the major technical seminars that took place from autumn of 2003 to 2004 had over 1,200 participants, notably from electronics retailers.

These seminars were held to coincide with the start of digital terrestrial broadcasting on December 1, successfully assisting the participants to obtain the latest timely information on digital receivers, programming, and receiving systems.

Region	Date	Number of participants
Kanazawa	10/21/2003	250
Sendai	11/6/2003	70
Osaka	11/19/2003	235
Hiroshima	11/14/2003	130
Nagoya	11/19/2003	180
Tokyo	11/25/2003	200
Sapporo	2/4/2004	190
Total		1,255



Figure 8 Technical seminar held in Nagoya

CONCLUSION

This document reported on broadcast digitalization trends and activities to promote digital broadcasting penetration in Japan. It is important for promotional activities to be conducted jointly by the parties concerned such as governmental authorities, receiver manufacturers, and antenna manufacturers.

The Athens Olympic Games will be held in 2004. In the past, big global events such as the Olympics and FIFA World Cup have encouraged the diffusion of new broadcasting media. There is no doubt that this year’s Athens Olympics will also raise the interest of viewers and we are going to further develop activities for promotion using the occasion of the Athens Olympics.