Digital TV Broadcasting in Japan

12th. Feb. 2008

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Broadcasting Technology Division,
Ministry of Internal Affairs and
Communications Japan

Today's Topics

- **Digitization of Terrestrial TV broadcasting.**
- **Advanced Features of Japans' Digital Terrestrial TV Broadcasting System (named ISDB-T).**
- **Implementing Schemes for Expanding Digital Terrestrial TV in Japan.**
- **Special Advantages of Japan's System for Mobile Reception.**
- **Summaries.**

Digitization of Terrestrial TV broadcasting

1. High information capacity broadcasting

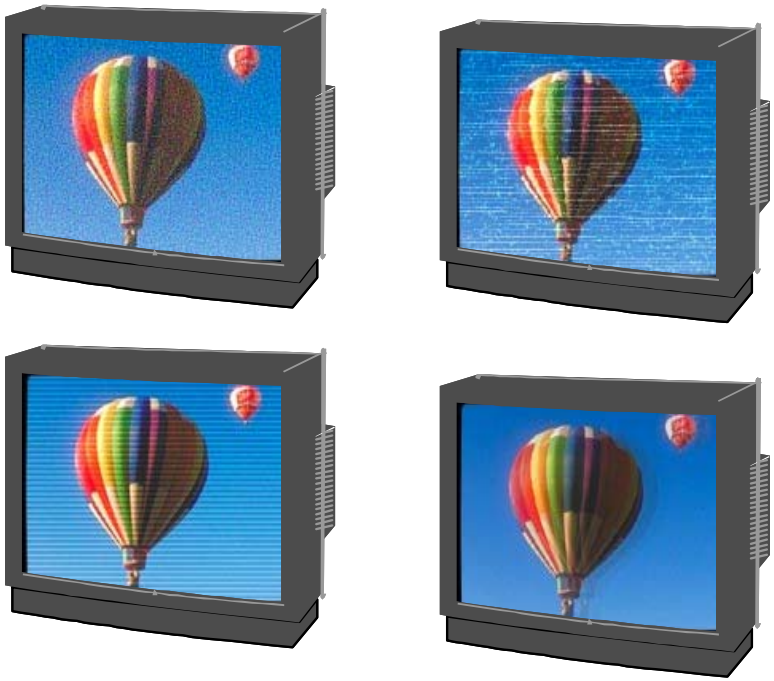
Analog TV

Multi-channel SDTV

HDTV

2. Robustness

Analog TV



Ghost and Noise

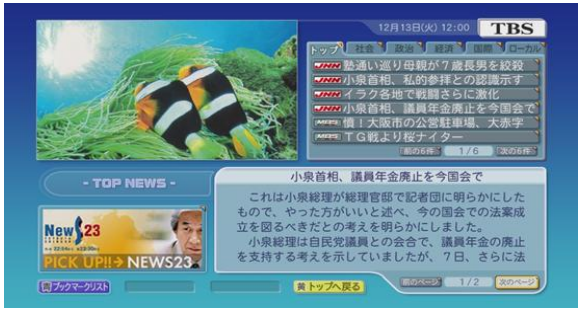
Digital TV

High quality image and sound

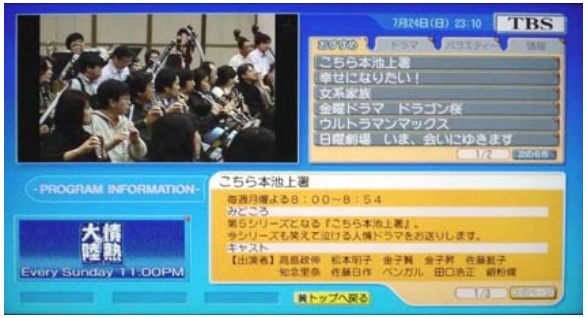
3. High functionality

Data Broadcasting

Weather forecast



News

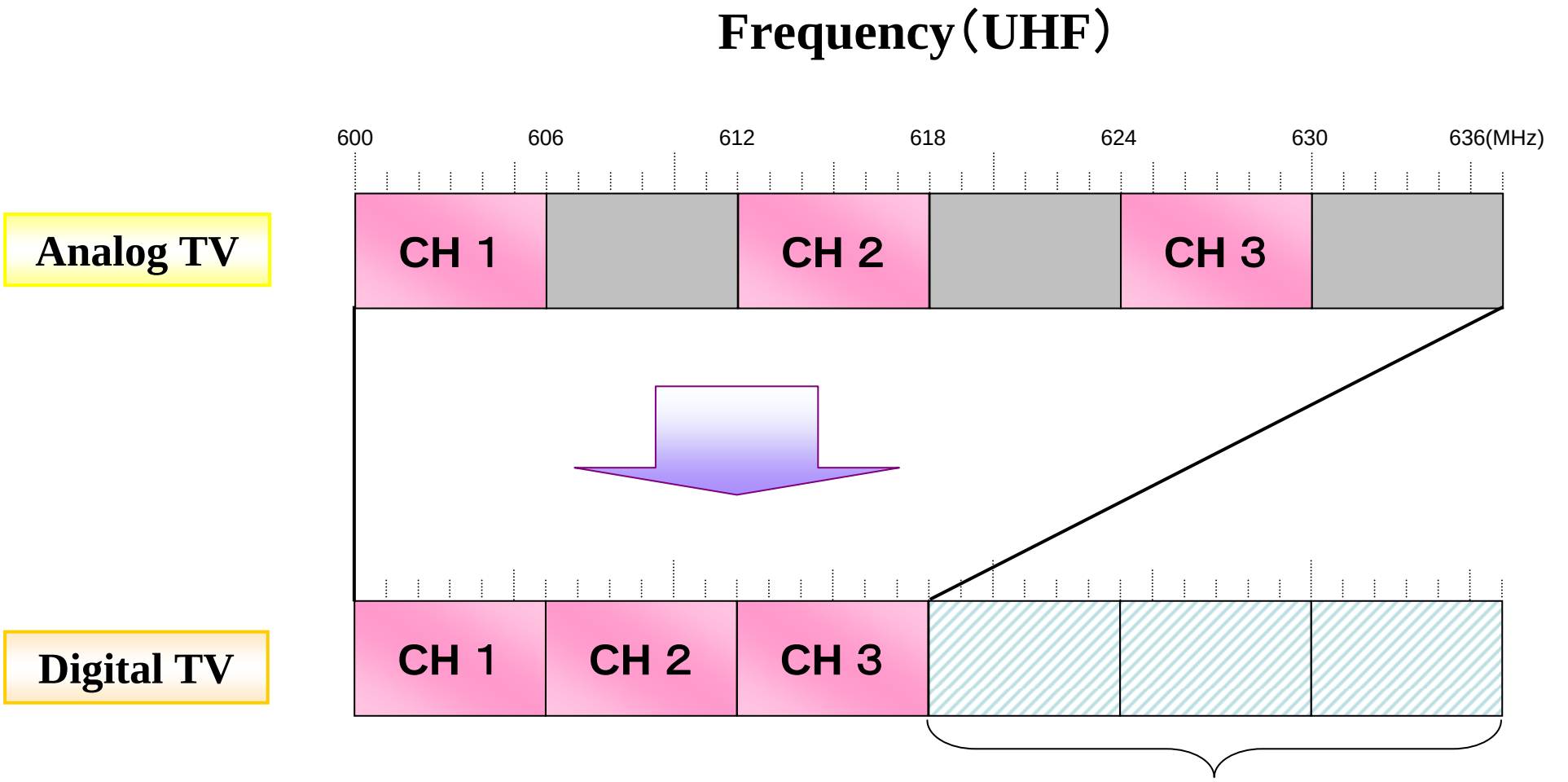


Information linked to on-air program

Interactive TV, e.g. interactive shopping

You can see the products and you can buy them directly.

4. Efficient use of radio frequencies



5. Affinities with other ICTs

Camera

Mobile phone

TV

PDA

Recorder

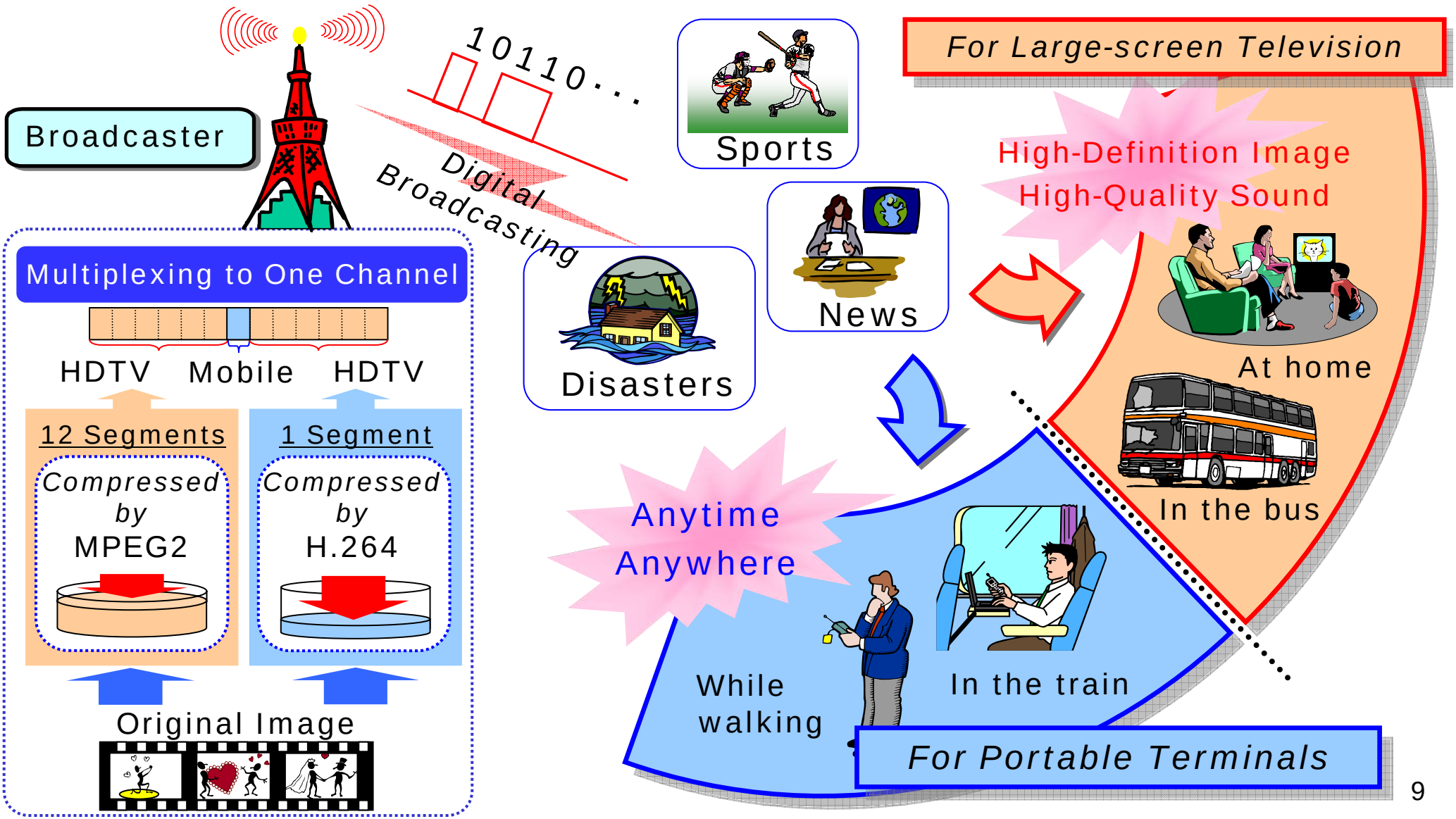
Personal computer

All other ICT products are digitized.

Advanced Features of Japans' Digital Terrestrial TV Broadcasting System (named ISDB-T)

ISDB-T is a Suitable System for Next Generation Broadcasting

HDTV, Mobile Reception, and Data (Multimedia) Broadcasting are necessary for Next Generation Broadcasting.



Features of ISDB-T

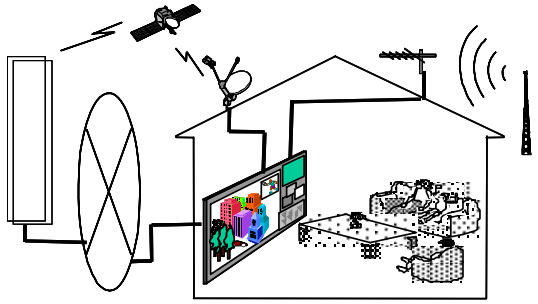
HDTV

High quality image and sound service

Multi-Channel Service

Realization of multi-SDTV program service on 1ch bandwidth (6MHz)

Interactive TV



Communication linked services with TV

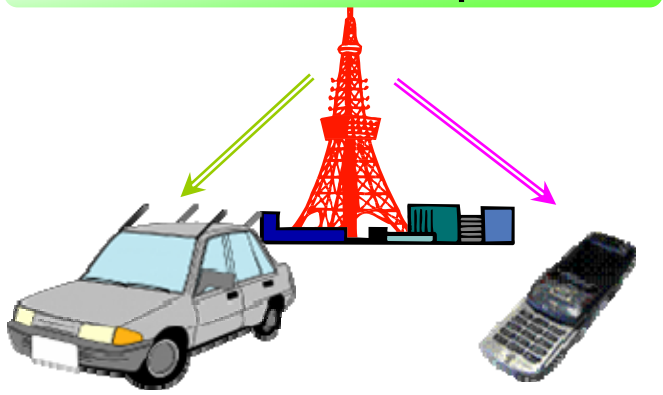
High quality image

High Robustness to ghost image interference

Data Broadcasting

Simple retrieval of program and information at any time

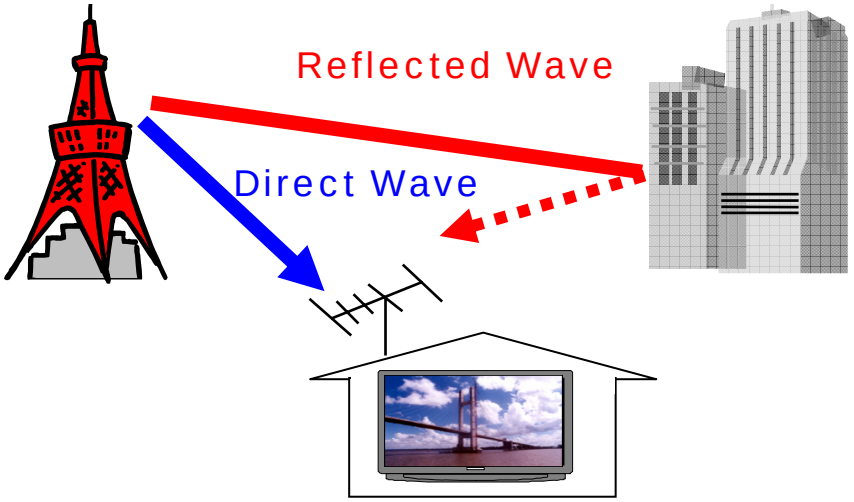
Mobile Reception



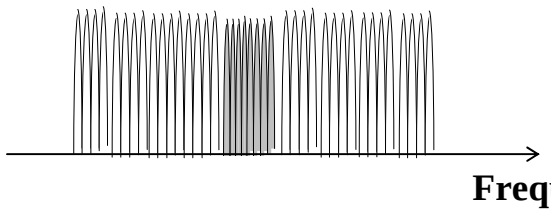
TV service to In-car DTTB Receiver and cell-phone

Technical Features of ISDB-T ① & ②

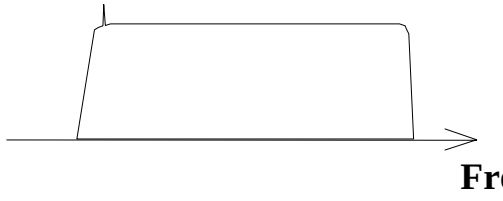
①Robustness to Radio Interference by Multi Path.
Because of OFDM system is adopted .



OFDM: Orthogonal Frequency Division Multiplex

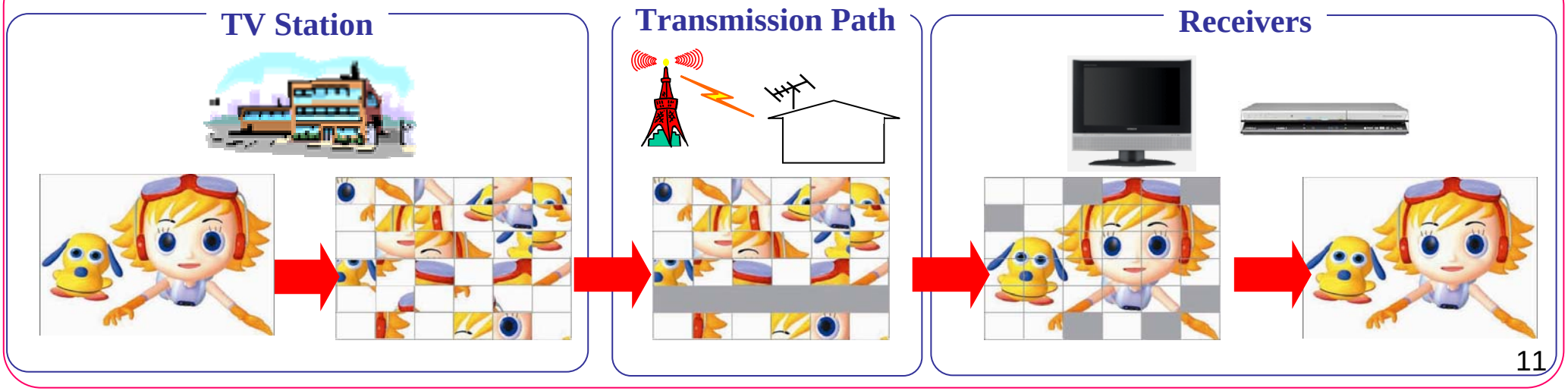


Ordinary system



Stability of reception for mobile HDTV reception !

②Frequency and Time Interleaving



[Reference]

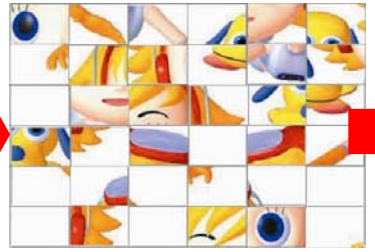
Comparison of Interleaving and No-Interleaving

TV Station

No-Interleaving

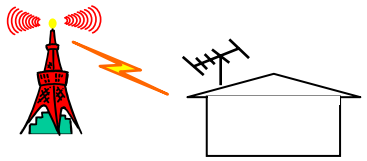
Original date

Interleaving

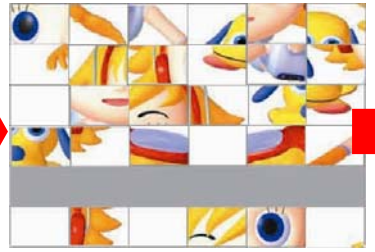


Sort data in accordance with set rules

Transmission Path



Errors occur as a result of radio interference



Errors occur as a result of radio interference

Receivers

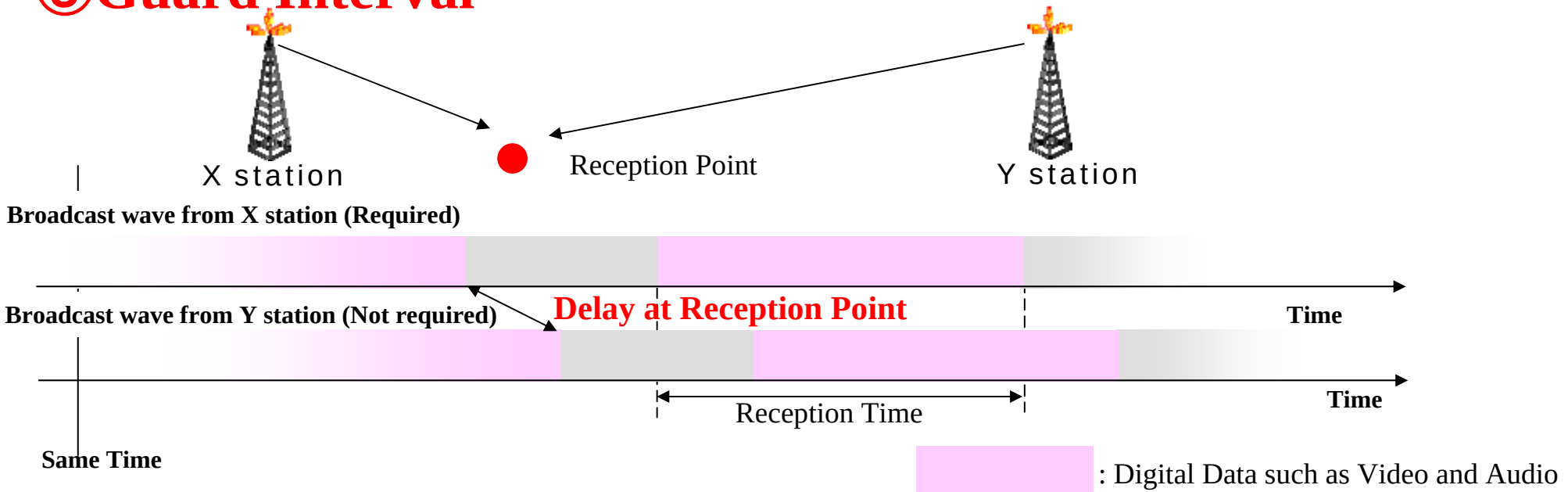
Difficult to correct continuous errors.

Reconstruction of data

Dispersed errors can be corrected.

Technical Features of ISDB-T ③

③Guard Interval



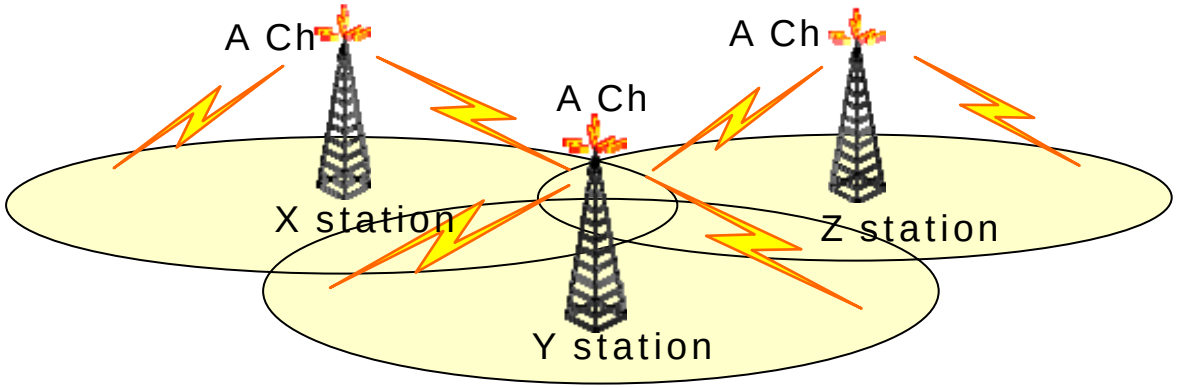
: Digital Data such as Video and Audio

: Guard Interval

Realization of Single Frequency Network

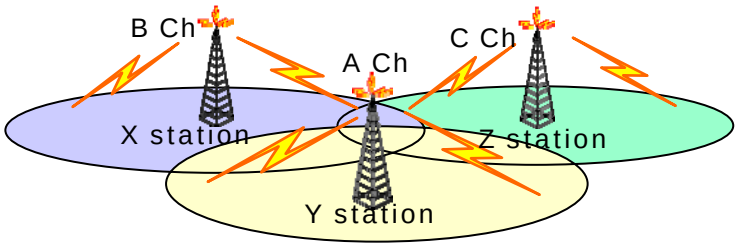
Effective Utilization of Radio Frequency

Over 10,000 stations can be set up using 40 Ch in Japan



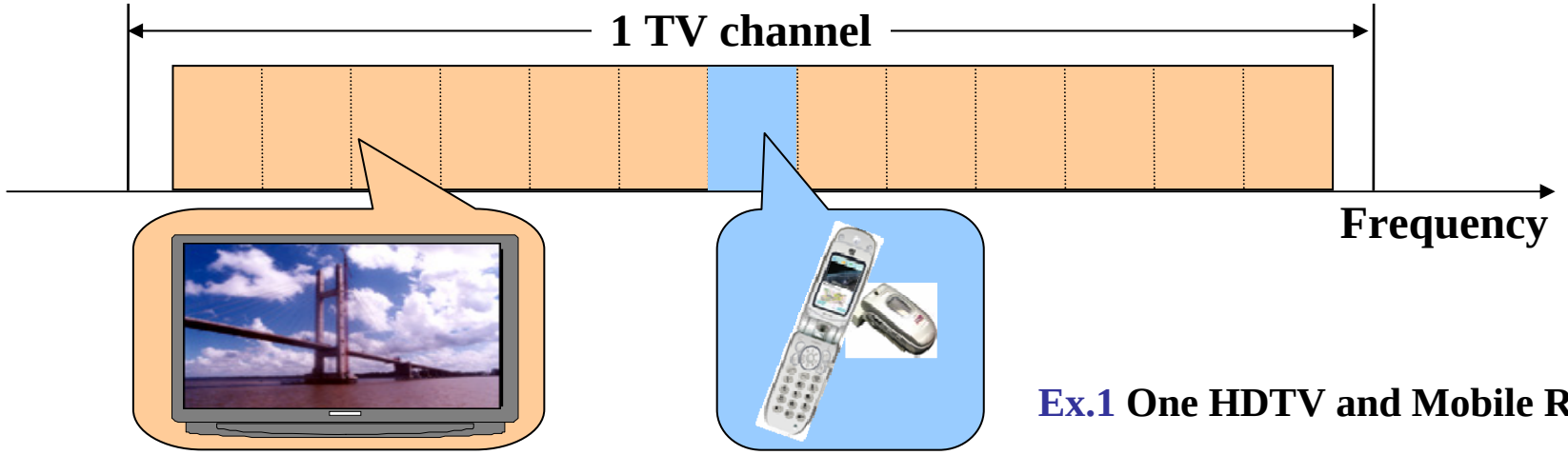
Reference

Multi Frequency Network

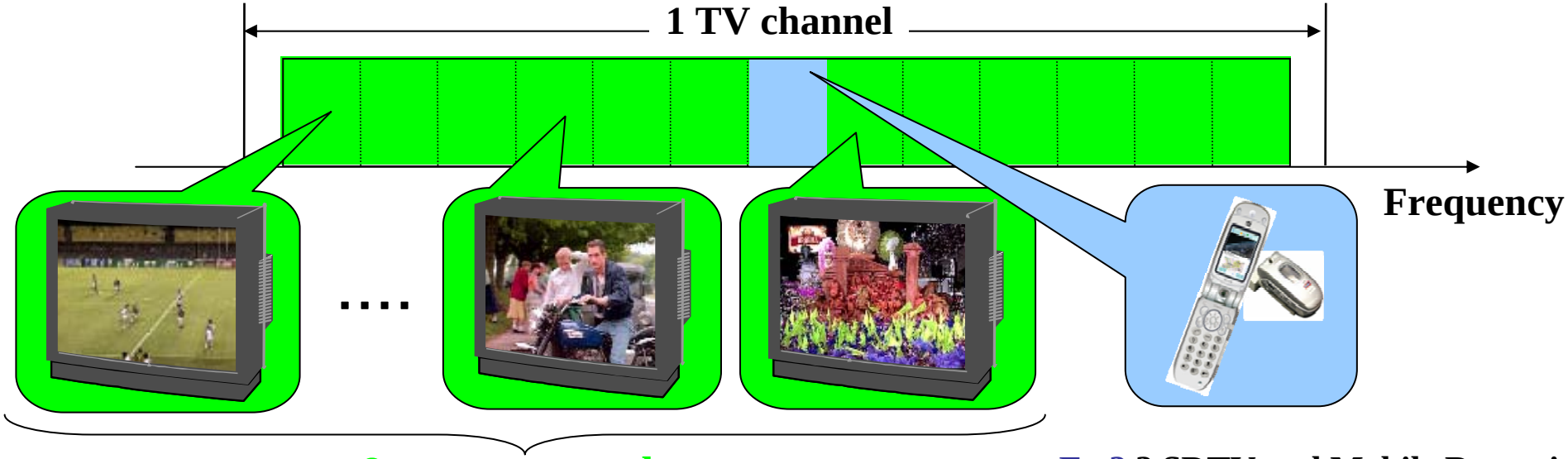


Technical Features of ISDB-T ④

④Segmented Frequency



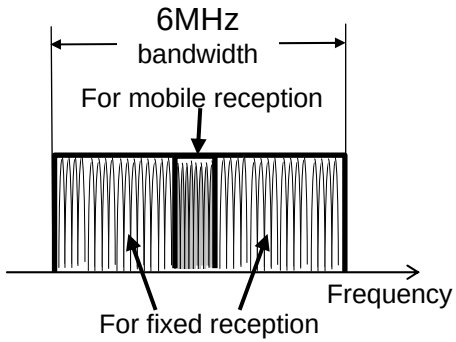
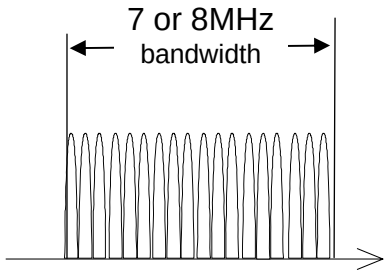
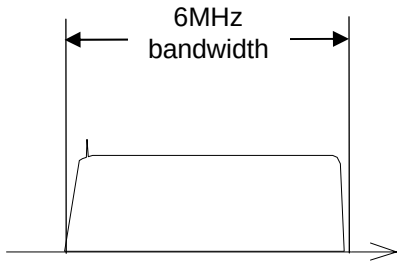
Ex.1 One HDTV and Mobile Reception.



Ex.2 3 SDTV and Mobile Reception.

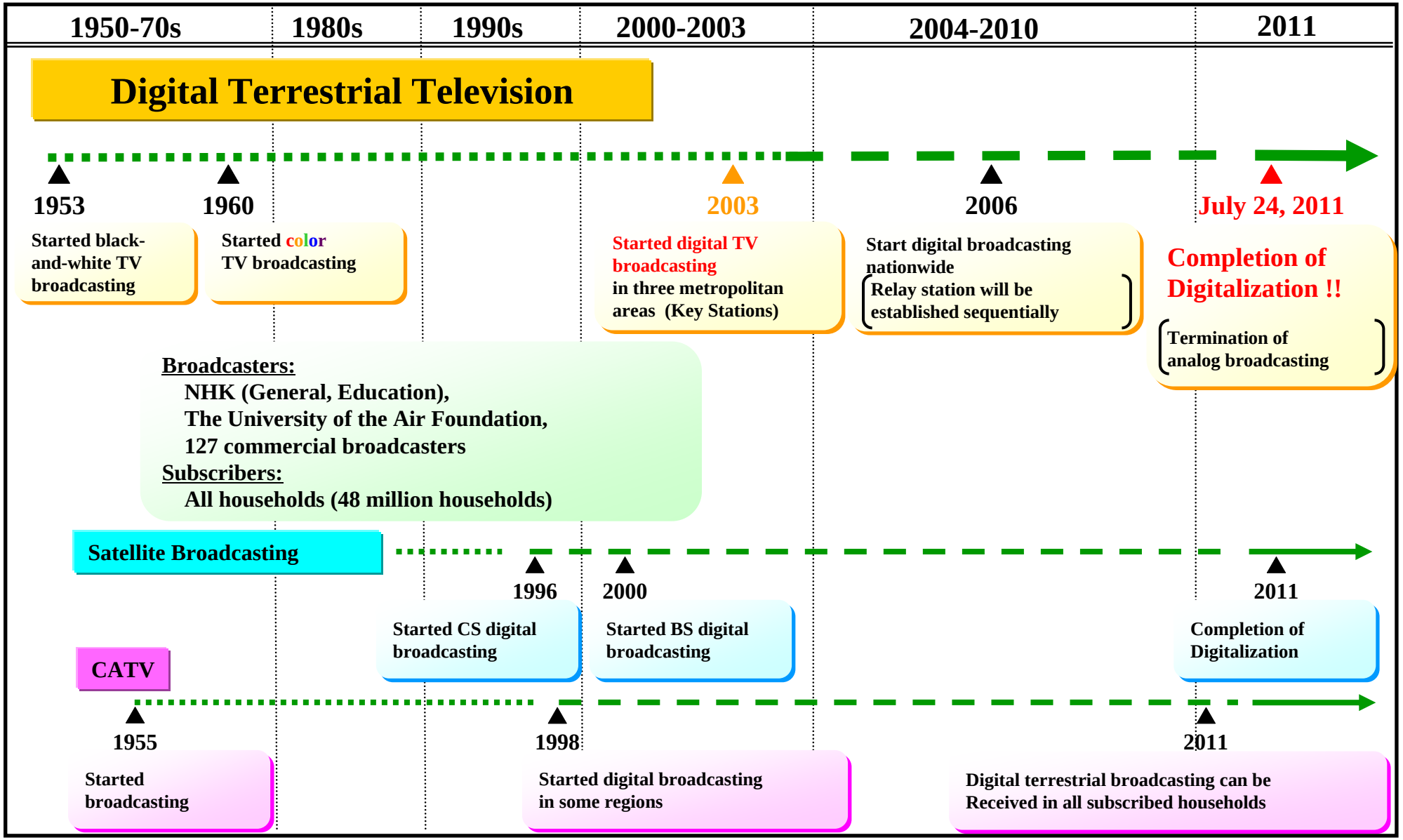
The segmented frequency structure is unique system of ISDB-T.

Comparison of Three DTTB Systems

Features \ System	Japan (ISDB-T)	EU (DVB-T)	U.S. (ATSC)
Transmission system	 **It is possible to designate the modulation system of the segment group unit according to the service purpose.**		 **Improved system based on analog TV broadcasting system.**
HDTV reception while moving	**possible**	**impossible (only SDTV)**	**impossible**
Portable reception using the same system as fixed reception	**possible**	**impossible**	**impossible**
Emergency Warning Broadcasting System	**possible**	**impossible**	**impossible**

Implementing Schemes for Expanding DTTB in Japan

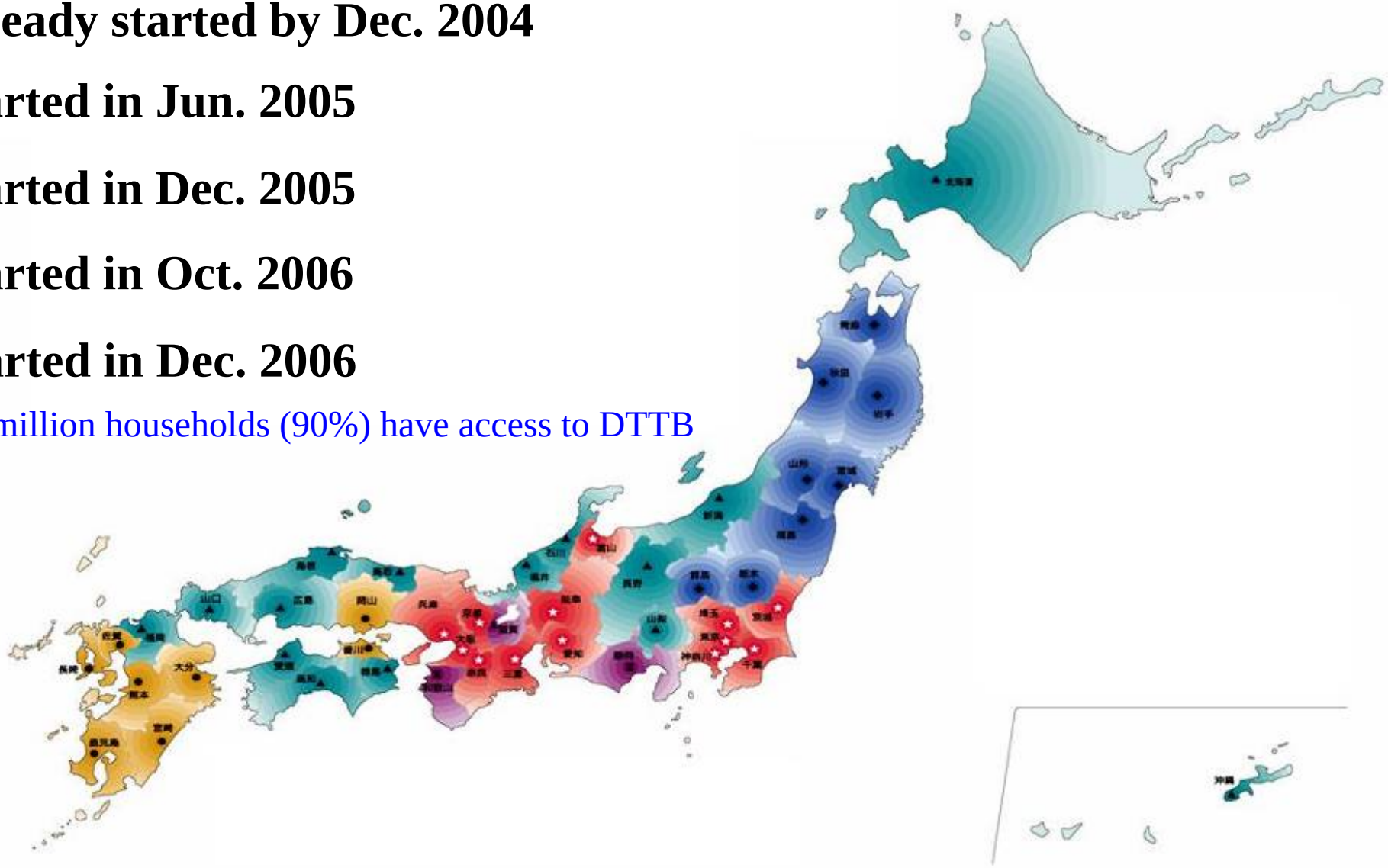
Schedule for Digitalization of Broadcasting in Japan



Expansion Schedule for DTTB in Japan

- **already started by Dec. 2004**
- **started in Jun. 2005**
- **started in Dec. 2005**
- **started in Oct. 2006**
- **started in Dec. 2006**

Over 40 million households (90%) have access to DTTB



Diffusion of Digital Broadcasting Receivers

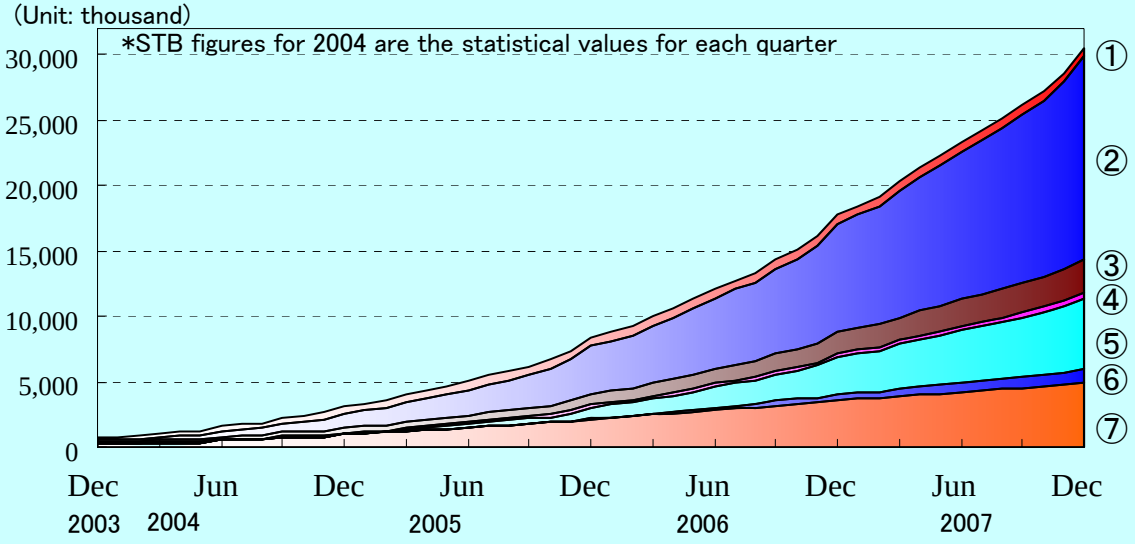
Digital Terrestrial Broadcasting Receiver Shipments

30,580,000

Source: Japan Electronics and Information Technology association (JEITA), Japan Cable Laboratory

(Unit: thousand)

① CRT	720	(± 0)
② LCD	15,450	(+1150)
③ PDP	2,580	(+ 150)
④ Tuner	420	(+ 20)
⑤ Digital Recorder	5,490	(+ 430)
⑥ Personal Computer	940	(+ 40)
⑦ CATV STB	4,980	(+150)



Access to Digital Satellite Broadcasting

33,590,000

Dec 2007 Source: NHK

Digital Satellite Broadcasting Receiver Shipments

32,070,000

CRT	1,860	(± 0)
PDP & LCD	18,520	(+1290)
Tuner (including Digital Recorder)	6,740	(+510)
CATV STB	4,950	(+150)

Access to Digital Satellite Broadcasting using CATV

1,520,000 households

One-Seg Mobile Phone Shipments

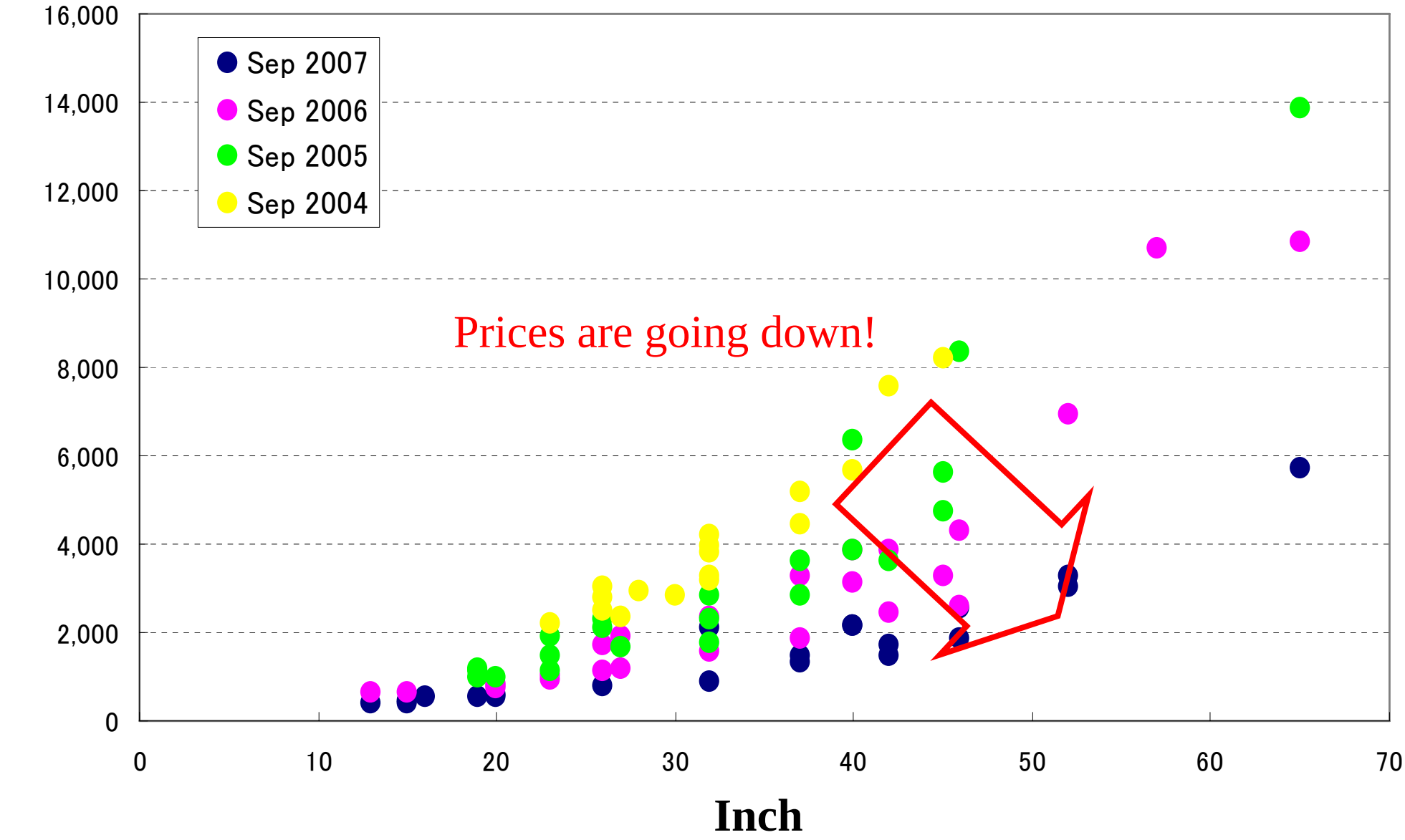
17,590,000 Nov 2007

In-car DTTB Receiver Shipments

1,030,000 Dec 2007

Source: Japan Electronics and Information Technology association (JEITA)

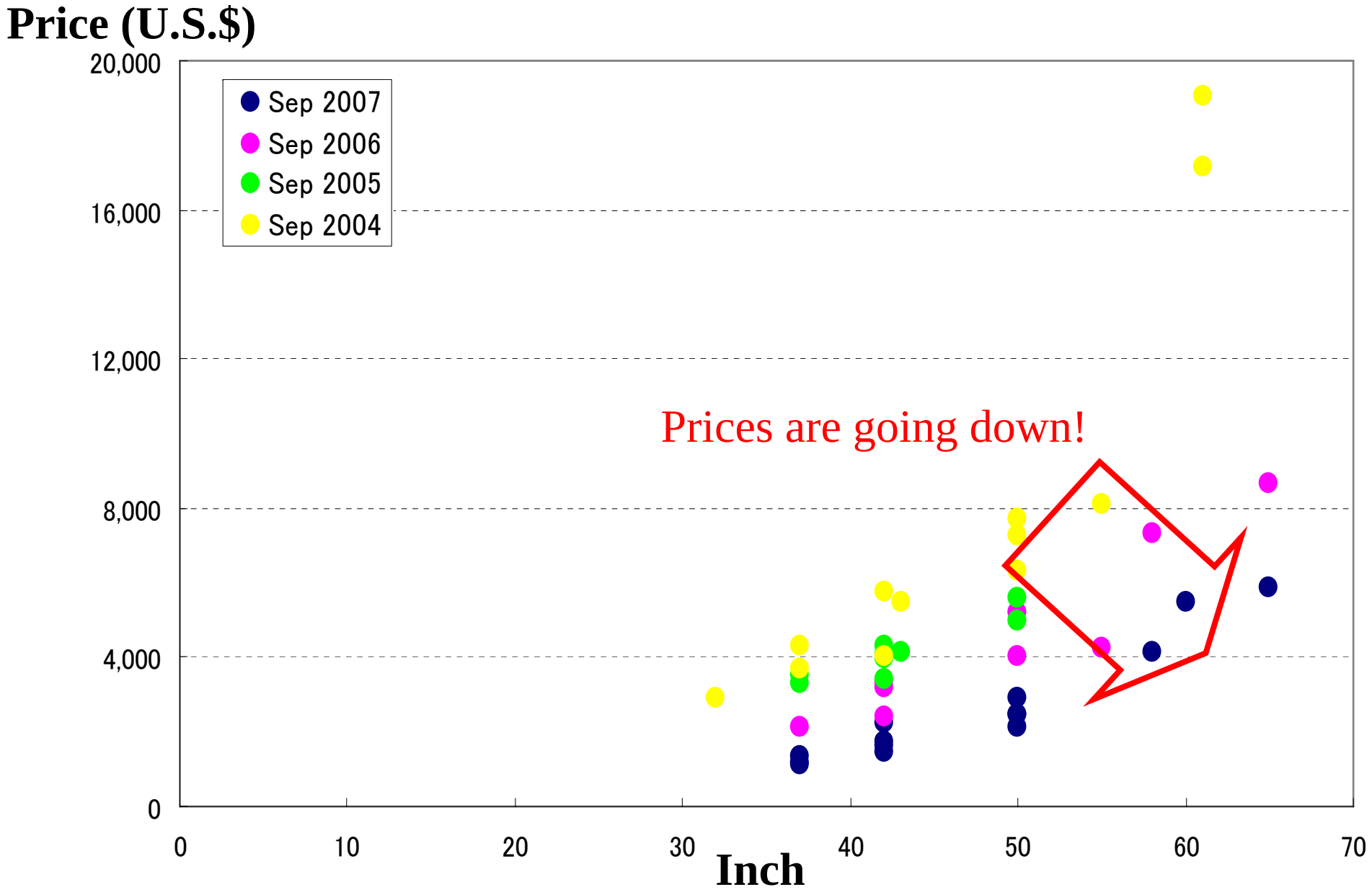
Distribution of LCD Price



Varied LCD Digital Receivers

PHOTO	TYPE	PRICE	URL
	ORION LD15V-TD1 (15-inch)	44,850 JPY (≒388 U.S.$)	http://www.orion-electric.co.jp/jp/products/index.html
	Victor-JVC LT-20LC8-S (20-inch)	59,800 JPY (≒517 U.S.$)	http://www.jvc-victor.co.jp/tv/lt-20lc8/index.html
	TOSHIBA 37C3500 (37-inch)	135,800 JPY (≒1,175 U.S.$)	http://www.regza.jp/product/tv/lineup/c3500/concept.html
	SHARP LC-46GX2W (46-inch)	225,800 JPY (≒1,953 U.S.$)	http://www.sharp.co.jp/aquos/lineup/gx2/index.html

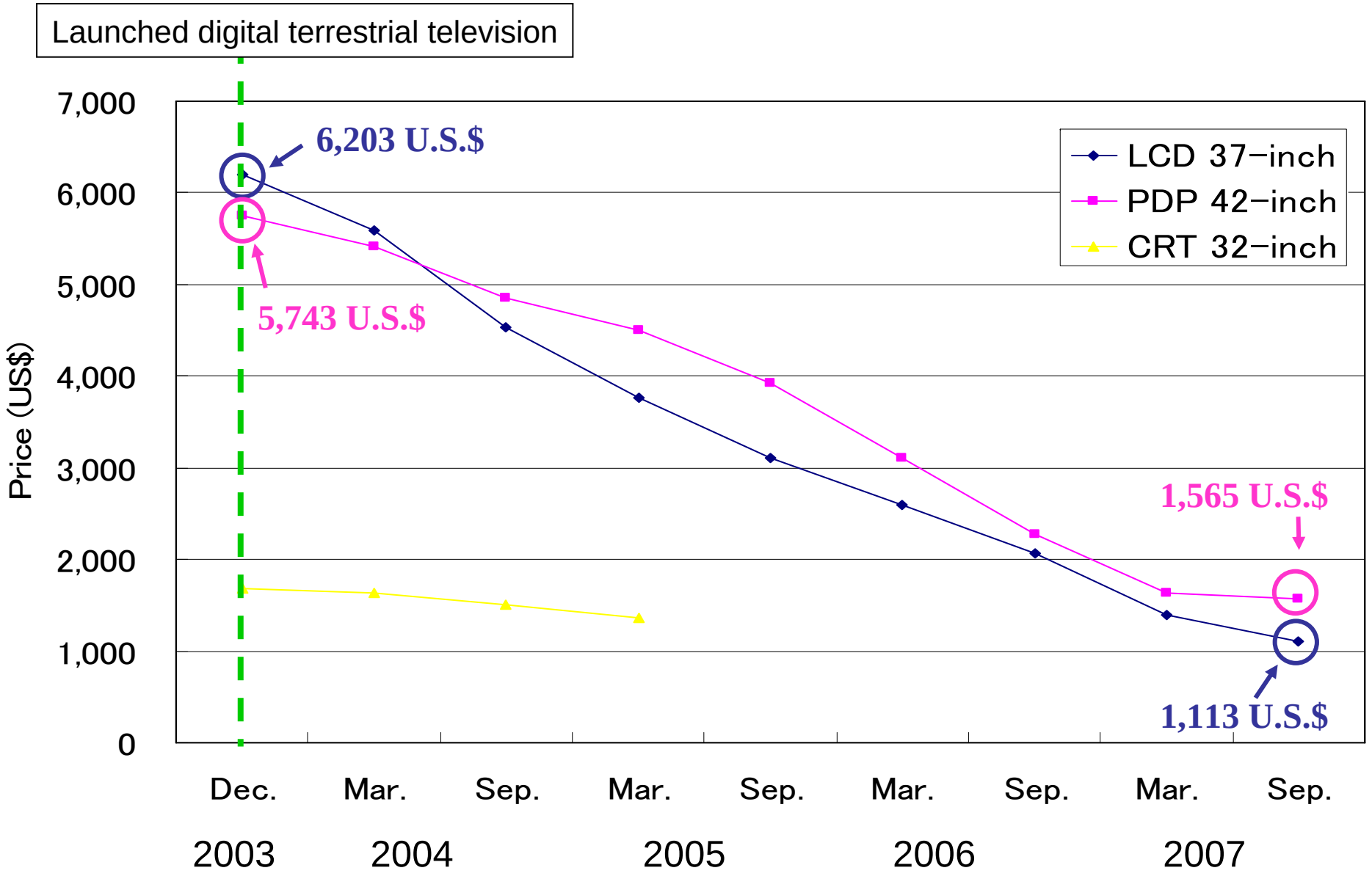
Distribution of PDP Price



Varied PDP Digital Receivers

PHOTO	TYPE	PRICE	URL
	HITACHI P37-H01 (37-inch)	123,900 JPY (≒1,072 U.S.$)	http://av.hitachi.co.jp/tv/plasma/01/index.html
	bydsign PH-5000DFK (50-inch)	239,800 JPY (≒2,074 U.S.$)	http://www.bydsign.jp/Form/Product/ProductDetail.aspx?shop=0&cat=101&swrd=&pid=PH-5000DFK&vid=
	Panasonic TH-65PZ750SK (65-inch)	719,800 JPY (≒6,227 U.S.$)	http://panasonic.jp/viera/products/pz750/index.html

Change in Price of Major Flat Panel Displays (FPD)



High-Performance Set Top Box

PHOTO	TYPE	PRICE	URL
	Panasonic TU-MHD600	45,800 JPY (≒396 U.S.$)	http://ctlg.panasonic.jp/product/info.do?pg=04&hb=TU-MHD600
	SONY VGF-DT1	42,987 JPY (≒372 U.S.$)	http://www.ecat.sony.co.jp/vaio/acc/acc.cfm?PD=26654
	SHARP TU-HD200	28,489 JPY (≒246 U.S.$)	http://www.uniden.jp/support/manualdl.html
	MASPRO DT400	27,842 JPY (≒241 U.S.$)	http://www.maspro.co.jp/new_prod/dt400/dt400.html

These products also correspond to BS and CS digital broadcasting services.

Low-Price Set Top Box

PHOTO	TYPE	PRICE	URL
	AVOX YDIT-10	15,213 JPY (≒132 U.S.$)	http://www.c-mex.co.jp/tuner.html
	YAGI DTC10	16,097 JPY (≒139 U.S.$)	http://www.yagi-antenna.co.jp/products/home/tuner/index.html
	MASPRO DT610	17,444 JPY (≒151 U.S.$)	http://www.maspro.co.jp/products/dt610/tokutyo.html
	I-O DATA HVT-ST200	19,300 JPY (≒167 U.S.$)	http://www.iodata.jp/prod/multimedia/tuner/2006/hvt-st200/

Implementing Scheme for Expanding Digital TV

➢**The National Council for Promotion of Terrestrial Digital Broadcasting (Broadcasters and MIC)**

- Studying challenges (both institutional and technical) involved in the transition to digital television broadcasting

➢**The National Conference for Promotion of Terrestrial Digital Broadcasting (broadcasters, manufactures, electrical appliance shops, consumer organizations, local governments, MIC, etc.)**

- Updating/revising "Action Plan for Promotion of Digital Broadcasting," describing items to be implemented by its members and the schedule thereof
- Developing/updating and publicizing "Roadmap of Construction of Broadcasting Stations" with the cooperation of the above mentioned Council
- Driving forward the activities for promoting digital broadcasting by announcing December 1st as "Digital Broadcasting Day"

➢**The Association for Promotion of Digital Broadcasting (Dpa) (broadcasters, Manufactures, etc.)**

- Publicizing broadcasting areas
- Responding to questions and inquiries from viewers

Outline of Seventh Action Plan to Promote Digital Broadcasting

○ **All parties concerned work together based on this action plan. "National Conference on Promoting Terrestrial Digital Broadcasting" (Established in May 2003) promotes this plan. The Conference finalized the " Seventh Action Plan for Promotion of Digital Broadcasting" on December 2006.**

Specific efforts by concerned organizations

■Terrestrial TV Broadcasters

○Development of a road map for DTTB Stations.

① This road map indicates a schedule for the construction of as many DTTB stations as possible , including small scale stations. This road map shows when access becomes possible and in which areas.

② TV broadcasters make sure they can meet this schedule

○Diffusion and promotion of the unique DTTB service

① TV Broadcasters try to increase the ratio of HDTV programs.

② Clarification of plans to provide enhanced services, such as a DTTB service for mobile reception.

■Receiver Manufactures and Shops ..etc

○Promotion of development and diffusion of cheaper, more varied DTTB receivers.

○Response to enhanced services such as DTTB for mobile reception and server-type broadcasting.

○Promotion of development of easy-to-use DTTB receivers for all users.

○Training for shop clerks ..etc

■ Government

○Clarification and publication of specific policy to ensure realization of the road map for DTTB Station and establishment of technical standards that enable swift and easy building of broadcasting stations.

○Publication of accurate information and schedule about DTTB in a way ordinary people can easily understand.

Official Supports for Broadcasters

Support by the "Extraordinary Law for Measures to Promote the Construction of Advanced TV Broadcasting Facilities" etc.

- **Preference for the national tax (corporate tax)**
- **Preference for the local tax (fixed property tax, real-estate acquisition tax)**
- **Supply of low- or super-low-interest funds by the Development Bank of Japan**

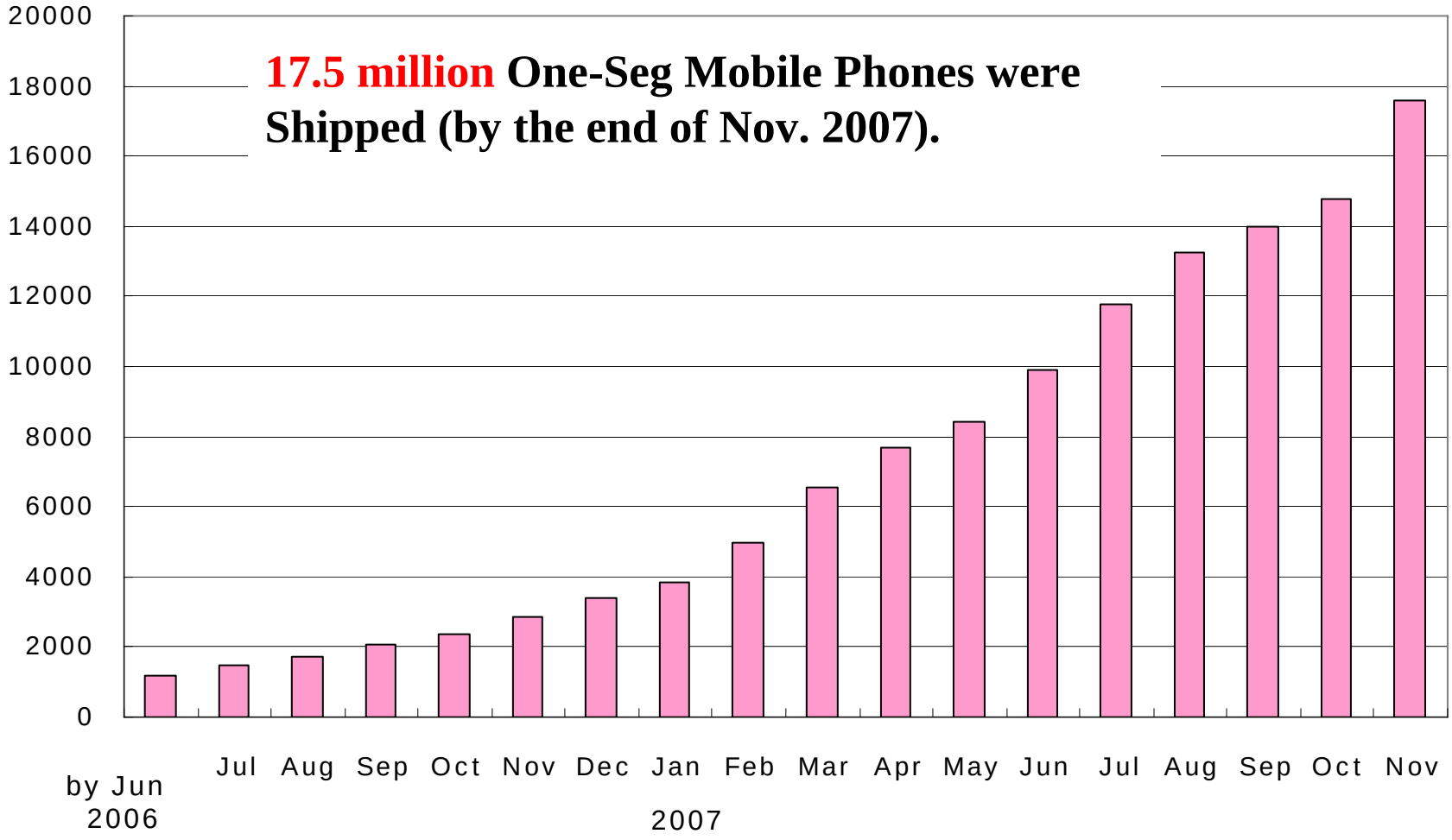
Financial support for the implementation of broadcasting stations in disadvantaged areas

Special Advantages of Japan's System for Mobile Reception

Demand Expansion for One-Seg Mobile Phones

- **One-Seg service started in April 2006.**
- **One-Seg Mobile Phone Shipments have been expanded and reached 1,000,000 for the first time in Jul 2007.**

(Unit: thousand)



One-Seg Broadcasting Receivers Introduced to the Market (1/3)

Mobile Phones


W33SA
(Dec 2005)


W41H
(Feb 2006)


W33SA Ⅱ
(Jun 2006)


W43H
(Sep 2006)


W43SA
(Oct 2006)


W44S
(Dec 2006)
Usable also as digital radio


W43H Ⅱ
(Jan 2007)


MEDIA SKIN
(Jan 2007)


W51CA
(Jan 2007)


W51K
(Jan 2007)


W51SA
(Jan 2007)


W51SH
(Jan 2007)
Usable also as digital radio


W51T
(Jan 2007)
Usable also as digital radio


W52T
(Jan 2007)
Usable also as digital radio

KDDI


P901iTV
(Mar 2006)


D903iTV
(Jun 2007)


D903iTV
(2007)


P903iTV
(2007)


SH903iTV
(2007)

NTTDoCoMo


905SH
(May 2006)


911SH
(Nov 2006)

SoftBank

Each company's press released merchandise in Japan

One-Seg Broadcasting Receivers Introduced to the Market (2/3)

Personal Computers

VGN-TX91PS, etc.
(from Jan 2006)

Sony

LesanceNB
CL206GW-GT/TV etc
(from Jul 2006)

Aro System

PC Card
(Mar 2006 OEM Supply)

PIXERA

USB connective Tuner
(DH-ONE/U2)
(Oct 2006)

BUFFALO

PC Card
MonsterTV 1D
(Nov 2006)

SKnet

T70S/V, etc.
(from Apr 2006)

Fujitsu

LavieA (LA700/GD)
(Sep 2006)

NEC

USB connective Tuner
(LDT-1S100U)
(Sep 2006)

Logitec

SDIO Tuner
(2007 OEM supplied)

ZENTEK

Express Card
MonsterTV 1D for DELL
(Nov 2006)

DELL

USB connective Tuner
PCTV-hiwasa(LOG-J100)
(Dec 2006)

LOGFARM

USB connective Tuner
VGA-TV1S
(Dec 2006)

SanwaSupply

USB connective Tuner
SEG CLIP(GV-1SG/USB)
(Dec 2006)

I.O.Data

USB connective Tuner
DigiTVe (LC-1SEGU)
(Dec 2006)

Live Creator

USB connective Tuner
QOT-W100
(Dec 2006)

Quick Sun

USB connective Tuner
DT-007
(Dec 2006)

TRYWIN

USB connective Tuner
K-ONESEG/U2
(2007)

KEIAN

USB connective Tuner
W-one(GH-1ST-U2K)
(Dec 2006)

GREEN HOUSE

USB connective Tuner
ON TIME TV(IM-1ST0001U/S)
(Dec 2006)

IMJ

Each company's press released merchandise in Japan

One-Seg Broadcasting Receivers Introduced to the Market (3/3)

Portable DVD Players

DVD-LX97
(Mar 2006)
Panasonic

SD-P90DT
(Dec 2006)

SD-P50DT
(Dec 2006)

TOSHIBA

ROSSINI RPD7100SN-SV
(Nov 2006)

NAGASE

axion
AXN6709TD
(Dec 2006)

※ One-Seg tuner
only for portable DVD player

SD-PDT1
(Jul 2006)

TOSHIBA

DVF-DTV100
(Aug 2006)

SANYO

Electronic Dictionary

Papyrus
PW-TC900
(Dec 2006)

SHARP

Game Terminal

Nintendo DS
(Nov 2007)

Nintendo

Digital Audio Player

gigabeat V30T
(Jul 2006)

gigabeat V30E & V60E
(Nov 2006)

TOSHIBA

Exclusive Terminals, etc.

※Usable also as
digital radio

BTV-400K
(Feb 2007)

BLUEDOT

One-segment unit
Produced by Wilcom
(Dec 2006)

PIXERA

Prodia
(Sep 2006)

Others

Radio

XDV-100
(Apr 2007)

SONY

Super One-seg TV Watch
(campaign prize)
Asahi Beer

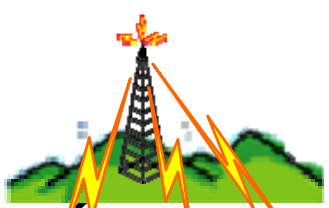
Original One-seg TV
(G I Challenge campaign prize)
Georgia

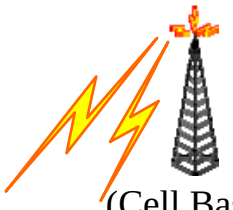
Each company's press released merchandise in Japan

Utilization of Broadcasting for Disaster Prevention

Text	Image
Possibility of ●● river flooding has increased. Residents in the surrounding areas should evacuate. Areas affected are as follows.	 Evacuate from this area !

Activation Control by Broadcasting
Non-congested communication
Power-saving feature is necessary





(Cell Base Station)

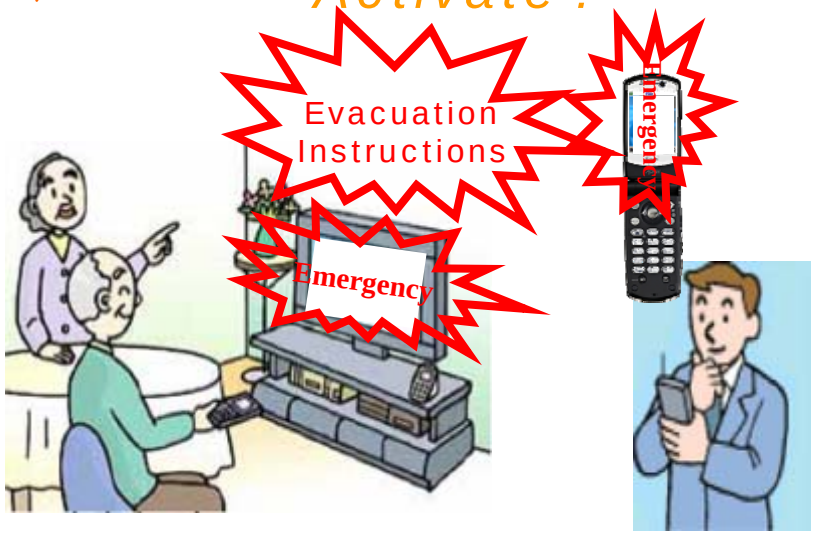
Activation control signal
&
Text and image

Activate !

Meteorological Agency

TV Station

Master Room
(on-air button)



Both in and outside the home.

Summaries

- Digitizing broadcasting consists of not only upgrading existing analog TV systems but also achieving attractive broadcasting service is the key to expand digital terrestrial TV for viewers.

- ISDB-T makes it possible to receive SDTV or HDTV while moving and provides the chance for enjoying new broadcasting service to users.

- ISDB-T can provide a “free” mobile TV reception service like ordinary TV broadcasting.

→ ISDB-T can be the most suitable system for expanding digital terrestrial TV .

Thank you !

- **Ministry of Internal Affairs and Communications (MIC) :**

  http://www.soumu.go.jp/joho_tsusin/eng/index.html

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