

Presentation 3

Future trend for the digital terrestrial broadcasting services

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Future plan and prospect for new DTTB services

• Enlargement of service area

•Digital terrestrial television services will start all over the country from 2006.

Analog television broadcasting will come to an end on July 2011.

Prospect for new DTTB services

- ·Mobile reception services : HD,SD,Data
- Interactive services
- Home-server Broadcasting services

Mobile reception services

Background

ISDB-T(Japan's Digital terrestrial television transmission system) has time interleaving function.

In addition, the research and development of space diversity technology has been done, and evaluated in field test.

As a result, HDTV reception in car become available.

HDTV mobile reception (1)

HDTV mobile reception for bigger screen in buses and trains



HDTV mobile reception (2)

Adaptive Array Antenna on the vehicle's window



Adaptive Array Antenna

HDTV mobile reception (3)

Comparison test for HD mobile reception



HDTV mobile reception (4)

Toyota Central Lab demonstrated HDTV Mobile Reception with Adaptive Array Antenna on 29th Jan. 2003.

- •UHF 15ch (whole segment reception)
- •Mode 3, 64QAM, 3/4
- •Guard interval: 1/8(128 µ s)

Pole type antenna (conventional)

Adaptive Array Antenna (attached on car wind shield)



Reference: http://ne.nikkeibp.co.jp/DTV/2003/01/1000016922.html

HDTV mobile reception (5)

The demonstration is expected to see at ITS World Conference in Nagoya on October 2004.



HDTV Broadcasting



Data Broadcasting



Mobile reception in a train (1)

Experimental test result for mobile reception on train



Indoor test result

- *QPSK, FEC=1/2, GI=1/4 , Mode3,*
- Max Speed=494km/h

Field test result

- Tohoku Shin kansen (bullet train)
- At Sendai city, Miyagi prefecture
- Constant speed 275km/h
- Mode2, FEC=1/2, GI=1/4, T.I=0.43ms, SFN
- Percentage of success reception rate (without tunnel area)
- **OSPK** 90.3 %
- 16QAM 74.5 %

Mobile reception in a train (2)

Effect of Time Interleaving

- As the experimental result, time interleaving improve required CN ratio about 7 dB in mobile environment on 16QAM.
- Diversity system improve about 7dB on 16QAM.
- Time interleaving (time diversity) work independently from space diversity.
- That is the reason for advantage of ISDB-T in mobile environment.
- Time interleaving improve robustness against impulse noise interference that come from power line and motor cycle engine.

Portable reception on cellular phone (1)



Portable reception on cellular phone (2)

History of Development





MiniSD*



Specifications of TV Mobile Phone

	miniSD	OFDM
Prototype	W11H	
Weight	130g	140g
Size	50mm(W) × 100mm(H) × 38mm(D) Not Including OFDM Tuner	
Battery	2-2.5Hour	2Hour
CPU	SH-Mobile	
RAM	64 MB	
LCD	QVGA	
Memory	64MB (miniSD)	

*MiniSD type terminal stores broadcast contents in its MiniSD memory card to emulate broadcast reception when RF signals are not available over the air.

Portable reception on cellular phone (3)

Specifications of the Software

Broadcast Contents



Multiplexing Type	MPEG-2 TS
Video	MPEG-4 Visual Simple Profile
Audio	MPEG-2 AAC LC
Data	BML Cellular Phone Profile (based on ARIB STD B24 Appendix 4) + KDDI Profile
Raster Picture	PNG
Vector Graphics	SVG
Sound	SMAF

Data Communication Contents #for BML and Internet Browser

Communication Contents	XHTML Basic+CSS2 subset+ECMA Script +KDDI Profile
Raster Picture	PNG
Vector Graphics	SVG
EVDO Streaming Data	MPEG-2 TS(MPEG-4 Visual + MPEG-2 AAC)
Sound	SMAF

Portable reception on cellular phone (4)



Portable reception on cellular phone (5)

Implementation Schedule toward portable reception

- Service will start by the end of next year.
- Video compression system : MPEG4 AVC/H.264
- Patent agreed in March 2004
- Prototype receivers already developed by manufactures



Portable reception on cellular phone (6)

Sample of prototype of receivers

• SANYO



• KDDI (developed with NHK)



● NEC



● PANASONIC



Portable reception on cellular phone(7)

Prototype of cellular phone receiver (May, 2004)



Portable reception on cellular phone(8)

ISDB-T one segment Front-end module and Antenna

- Panasonic announced ISDB-T one-segment front-end module for cellular phone and PDA.
- RF tuner circuit and OFDM demodulator are installed in this module.
- Specifications;
 - Size; 20mm × 28mm × 2mm
 - VHF 7ch, UHF13~53ch
 - Length of the antenna; 50mm
 - Power Consumption; 200mW
 - Modulation; DQPSK and QPSK and 16QAM



Portable reception on cellular phone (9)

Examples of cellular phone services (1)

File Download (Music, Picture, Video)





- 1. Tune the favorite broadcast station.
- 2. Select the download list .
- 3. Certificate and storage via communication links.
- 4. Download on the table of contents lists.
- 5. Reproduce on the terminal.

Portable reception on cellular phone (10)

Examples of cellular phone services (2)



Portable reception on cellular phone (11)

Examples of cellular phone services (3)





- 1. Tune the favorite broadcast station.
- 2. Select the Ticket sales site.
- 3. Access to Ticket sales site via communication links.
- 4. Purchase, certificate and storage.

Portable reception on cellular phone (12)

Examples of cellular phone services (4)





- 1. Tune the favorite broadcast station.
- 2. Watch the program and notice the Questionnaire.
- 3. Fill the questionnaire table.
- 4. Send your answer of questionnaire via communication link.

Portable reception on cellular phone (13)

Other example for mobile reception

Car navigation system



PDA (Personal Digital Assistant)



Server-type broadcasting service (1)

Outline of Server-type broadcasting service



Server-type broadcasting service (2)

Outline of Server-type broadcasting system



Server-type broadcasting service (3)

Server-type broadcasting service image



- •Free information services
- Pay per view type services
- Fixed amount subscription type services
- Contents purchase type services



Have fun any time



Local government service on DTTB (1)

Background

(1) Integrated service of DTTB/Communication is expected for administrative service.

(2) In Gifu prefecture, central area of Japan, conducted experimental test started on Feb. 2004 to evaluate the effect of integrated service of DTTB/Communication for local government community services.

(3) Local government, local public body, communication carrier, broadcaster and MPHPT participated this experimental test.

Local government service on DTTB (2)

Outline of local government information service on DTTB (Gifu prefecture in 2004)



Local government service on DTTB (3)

Data editing flow & transmission image



Local government service on DTTB (4)

Top page of Data broadcasting



Local government service on DTTB (5)

Data broadcasting carousel contents



Local government service on DTTB (6)



Local government service on DTTB (7)

Data broadcasting carousel contents

1. Guide & reservation service 2. Guide & rental service of city library 3. Information of of sports facilities historical library ファローおしさんのおくりもの 新聞的にみ 茶 オームウトモニー酸 Manager Street & or \$ 4.Information of 5. Sightseeing guide foods market 一 前口田書車 THE ROTATION **6.Questionaire** 7. Mini-game BRANTING CONTRACTOR 場部など) 古道の注意に近ちましたか Gifu city information page (Top page of communication contents) 生在ボタンで調剤等 動かんましょう

Local government service on DTTB (8)

Data broadcasting carousel contents

Information Services

Local government information services are more familiar with TV viewers.

Details of services

Detail information services are sent from servers dedicated for this test via internet and/or telephone line with data modem. Monitor household look for this information on the portal pictures which are transmitted though DTTB data broadcasting channel of local broadcaster.

Facilities reservation services

Reservation service for public facilities. Viewers will make reservation for facilities via internet and/or telephone with data modem and certificate by registered ID/Password.

Home doctor service on DTTB

Home doctor service

Programs receive via broadcasting wave.
Personal information receive via Internet.

Internet TV (1)

Internet TV (2)

Internet Screen

One Screen Mode

Internet Screen

TV Mode

Dual Screen (TV + Internet) Mode

PRINARAMUTVI

De la line garre, der bei R. D. 70-1200 von tradition **FIRE DOUBLE WINDOW**

C (5111

Internet TV (3)

EPG and T-navi Portal Site

T-navi:

Dedicated sites for TV internet viewers

Internet TV (4)

Digital sound radio service (1)

Outline of Digital sound radio receiver

Digital sound radio service (2)

Prototype of PDA D-radio Receiver

Thank you for your attention ! END **Digital Broadcasting Experts Group**

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