



# ***ISDB-T applications***

## ***Present and Future***

***Feb. 28<sup>th</sup>.-Mar 1<sup>st</sup>.2007***

***Jakarta, Indonesia***

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***TV-Asahi***

**DiBEG**

Digital broadcasting experts group



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**ISDB-T  
is filled with  
leading-edge technologies  
to make your dreams  
come true !**

# Contents

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**□ *Present services of ISDB-T***

**□ *Future services of ISDB-T***



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# ***Present services of ISDB-T***

# Powerful applications

## HDTV



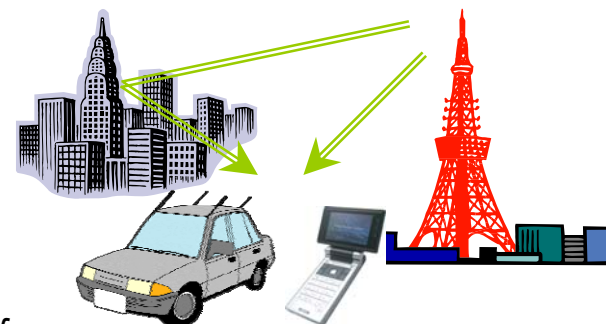
- High quality image on wide screen and CD quality sound.

## Data broadcasting



- Local news and weather forecast for viewers at any time.

## Mobile accesses



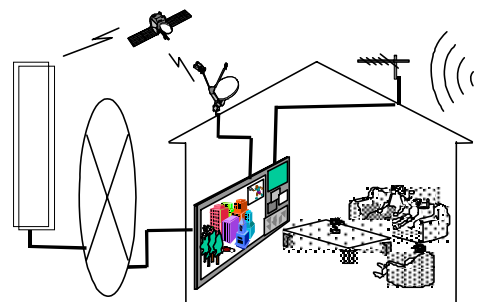
- Transmission service to Mobile accesses

## Multi-channel program



- Standard quality multi-channel service

## Interactive TV



- Offers Interactive service

# HDTV

## □ *High Definition Television Program*

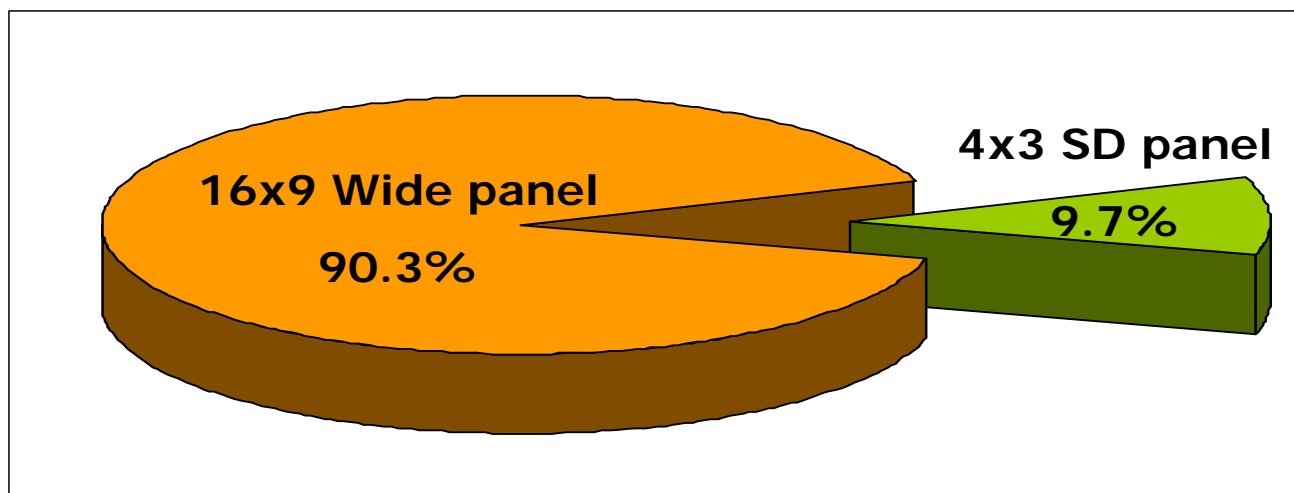
- ✓ *The high quality images on a 16x9 wide screen and CD-quality sound make you feel as if you were at the theater.*
- ✓ *European broadcasters have opted for “multi-channel” strategy, but Japanese broadcasters have chosen to take advantages of “high definition” pictures.*
- ✓ *HDTV is a killer application.*



## *HDTV (2)*

□ *More than 90% of TV sets in the market have a 16x9 wide panel.*

■ JEITA 2006 Domestic Shipments of Major Consumer Electronic Equipment



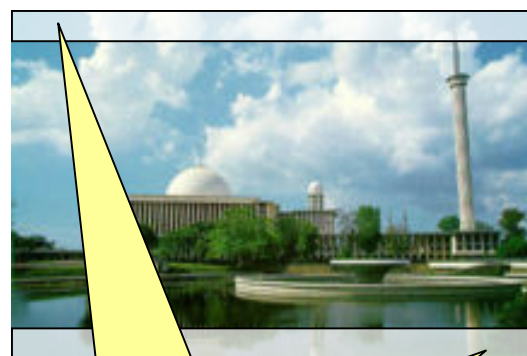
□ *Wide panel TV sets have been the mainstream.*

## *HDTV (3)*

□ *On a wide panel TV set, standard definition programs are displayed either with side panels or trims.*



*Side panels*



*Trims*

## *Multi channel program*

**□ ISDB-T can transmit multiple SD programs simultaneously on a single digital spectrum.**



***SD-1***



***SD-2***



***SD-3***

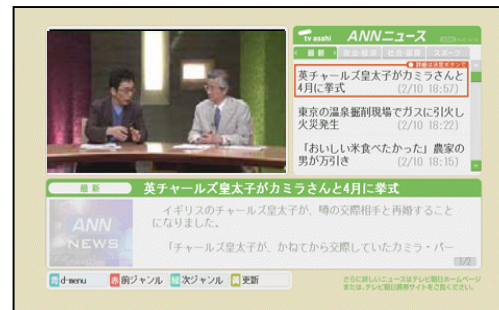
# Data broadcasting (1)

□ *Data broadcasting is an additional service.*

■ *By clicking on d-button of a remote control unit, you can access your requested information such as local weather forecast, 24H news and information linked to on-air program.*



*Local weather forecast*



*Local news*



*Information linked to on-air program*

# Data broadcasting (2)

## □ Basic page format



- Present time and date
- Today's recommendation
- Weather forecast
- News
- Fortune-telling service

Local weather information

News banner

TV station ad banner

## *Data broadcasting (3)*

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### **□ 2 types of data services:**

#### **■ Program-linked contents**

- *Information service linked to on-air programs*
- *Accessible during on-air*

#### **■ Non-linked contents**

- *Information service not linked to on-air programs*
- *Accessible any time*

# Data broadcasting (4)

## □ Program-linked data contents

On-air program



Click on  
d-button



Basic page format



Linked data page format



Click on  
a program title

Contents  
Menu

# Data broadcasting (5)

## Non-linked contents

tv asahi d-menu

09月05日 (月) 18:00

イチオシ!

お天気情報

ANNニュース

◆テレビ朝日を含む全国26局が発信するニュースです

やじプラ占い

愛・地球博

ご利用の方へ

今日の天気

東京都港区 最高 12°C 最低 -1°C 降水確率 0%

ANNニュース 英チャールズ皇太子がカミラさんと4月に挙式

ANNニュース ご利用の方へ テレ朝NEWS! お知らせ

Today's recommendation

tv asahi

ロンドンエクスプレス

50-50

「50-50」の女性芸能人バンスファイト〜鈴木紗理奈が今回は大人気女優「伊東美咲」と電車目撃合戦〜というお題で対戦! 今度こそ50-50達成するか!?

Weather forecast

tv asahi

これから天気

東京都渋谷区

天気

気温

降水

湿度

11月18日1時発表

青い空に太陽が輝き、お天気としては二重丸! 夜にかけても天気の崩れはありません。晴れの天気とともに寒さも続き、空気が乾燥していきます。暖房器具を使う際には十分注意して下さい。

News

tv asahi ANNニュース

英チャールズ皇太子がカミラさんと4月に挙式

東京の温泉掘削現場でガスに引火し火災発生

「おいしい米食べたかった」農家の男が万引き

Fortune-telling service

やじプラ占い

あなたの星座を十字ボタンで選び、決定ボタンを押してください。

牡牛座 4/20-5/20

双子座 5/21-6/21

巨蟹座 6/22-7/22

獅子座 7/23-8/22

天秤座 8/23-9/22

射手座 9/23-10/22

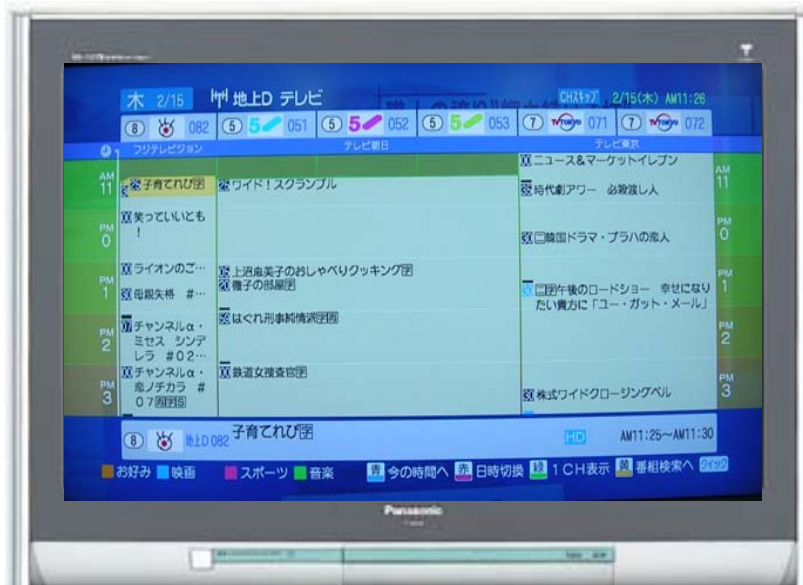
山羊座 10/23-11/21

水瓶座 11/22-12/21

双鱼座 12/22-1/19

## ❑ *EPG (Electronic Program Guide)*

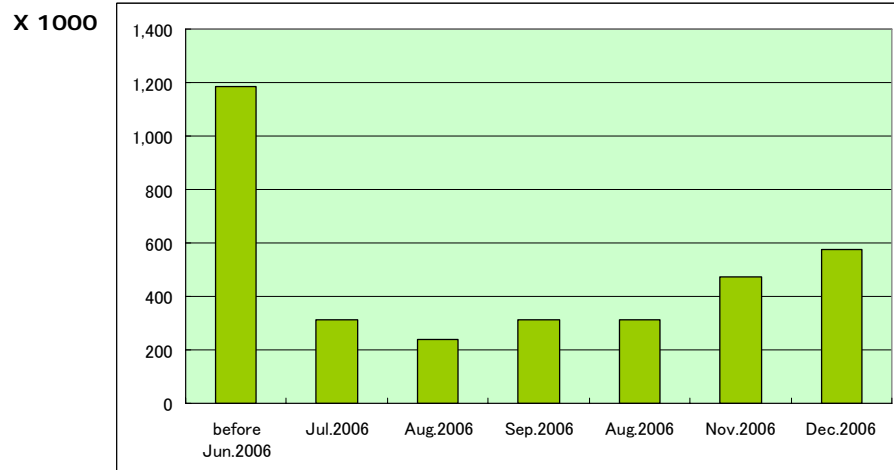
❑ **EPG (Electronic Program Guide)**  
 ■ An Electronic Program Guide (EPG) is an interactive schedule of current and upcoming programs that a viewer can display on-screen simply by pressing a button on his remote control unit.



# One-Seg service (1)

- *One-Seg is abbreviation for “one segment service” .*
- *One-Seg launched on April 1,2006 .*
- *More than 3.4 million cell phones with One-Seg service have been sold in the market according to JEITA statistics of Nov.2006.*

Domestic Shipments of One-Seg cell phones on 2006





## *One-Seg service (2)*

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- *The One-Seg service is transmitting moving images to cell phones, car TVs, personal computers etc. so that you can enjoy digital terrestrial television programs anytime anywhere.*
- *Merits*
  - ✓ *Stable reception in a mobile environment.*
  - ✓ *High quality video & audio in a mobile environment.*
  - ✓ *Robustness against noise and multi-pass.*

## One-Seg service (4)



- Video (H.264)  
*approx. 180-256kbps*
- Audio (AAC-SBR)  
*approx. 32-64kbps*
- Data-cast (BML)  
*approx. 20-80kbps*

# One-Seg service (5)



*On-air program*

## Example parameter

Modulation	QPSK
Code Ratio	2/3
Guard Interval	1/8
Bit Rate	416 Kb/s

*Display Image*

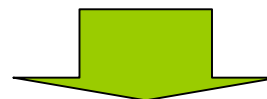


*Data service*

# *One-Seg service (6)*



*No subscription fee  
and  
Powerful television  
contents*



*Unique & Unparalleled  
Feature in the world*



# *One-Seg service (7)*

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## Example of business model

### □ Additional information service

The service can show additional information linked to on-air programs such as information on athletes and celebrities, recipes, questionnaire and quiz.

### □ TV shopping

The service enables viewers to purchase commercial goods shown on shopping program.

### □ Local service

The service can provide local information such as emergency alerts, local events, notice from local government or hospital.

# One-Seg service (8)

## One-seg receiver



Cell phone



Car TV



E-Dictionary



USB Tuner

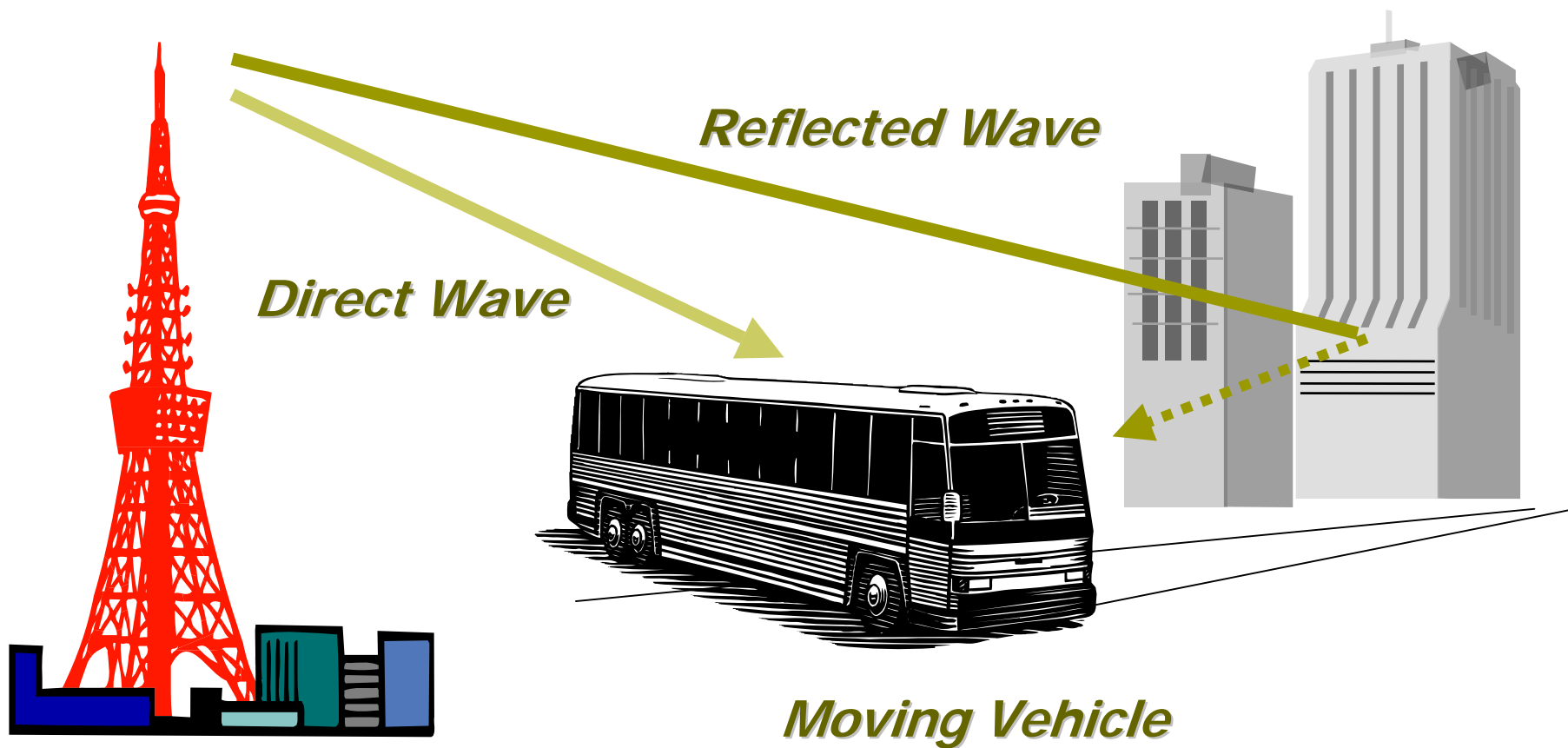


Audio player



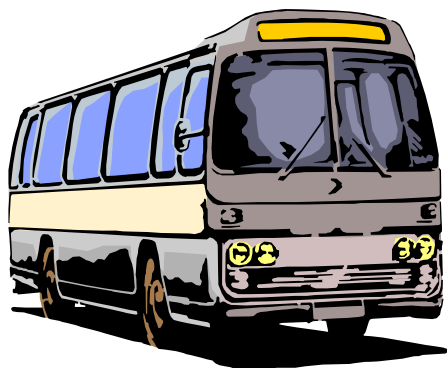
PC

# *HDTV mobile access (1)*



# HDTV mobile access (2)

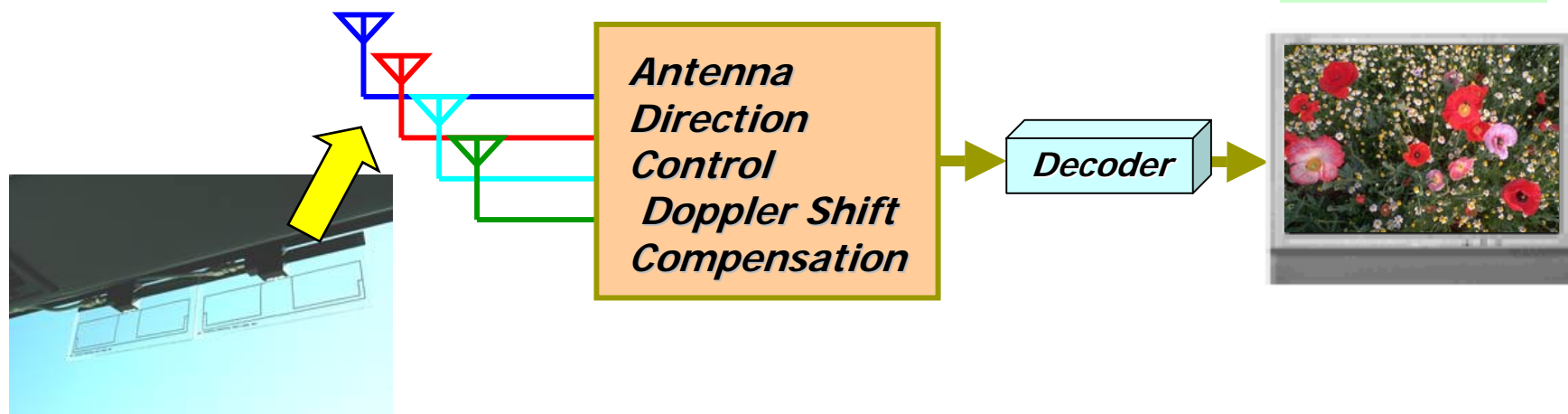
## Adaptive Array Antenna on the vehicle's window



*Receiving device*



*HD receiver*



*Adaptive Array Antenna*

# *HDTV mobile access (3)*

## Comparison test on HD mobile access

Digital Broadcasting

Analog Broadcasting



## *HDTV mobile access (4)*

*HDTV tuner for automobiles is now on sale.*



**Digital terrestrial television  
broadcasting tuner for  
automobiles**



**LCD for automobiles**

**High quality image wide-LCD panel.  
Faithful reproduction of DVD and digital  
terrestrial television broadcasting image**



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# ***Future Services of ISDB-T***

# *Mobile access on the bullet train (1)*

Experimental test result on mobile access on the bullet train.



## **Indoor test result**

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

## **Field test result**

*Experimental test was carried on a Tohoku bullet train at Sendai city, northern part of Japan.*

*Constant speed 275km/h*

*Mode2, FEC=1/2, GI=1/4, T.I=0.43ms*

*Percentage of reception rate (excluding tunnel areas)*

- **QSPK 90.3 %**
- **16QAM 74.5 %**



# ***Mobile access on the bullet train (2)***

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## ***Time Interleaving advantage***

- According to the result of the experimental test;
- Time interleaving improves required C/N more than 7 dB in the mobile environment of a bullet train at 16QAM.
- Diversity antenna system improves also more than 7dB at 16QAM.
- ISDB-T has an advantage in mobile environment.
- Time interleaving improves the resistance against impulse noise interference that comes from power lines and motor cycle engines.



## *One-Seg service in a subway car (1)*

**□ *SFP, Subway Filling Project, is organized by 6 major broadcaster, Hitachi, Panasonic, Sanyo, and Tokyo Metropolitan Subway. SFP carried out a One-Seg access test on a subway car inside the tunnel in March 2006.***



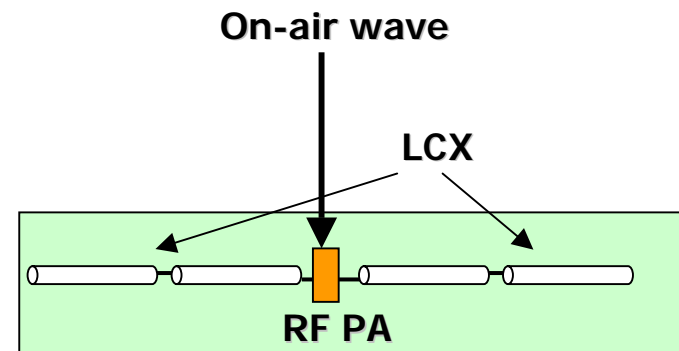
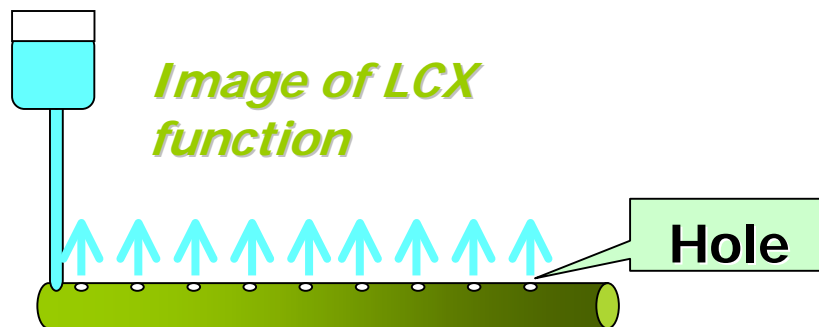
## *One-Seg service in a subway car (2)*

**□ *One-seg service on the subway car is convenient for passengers, and in the case of emergencies or disasters, it can be used to provide emergency information to the passengers.***

# One-Seg service in a subway car(3)

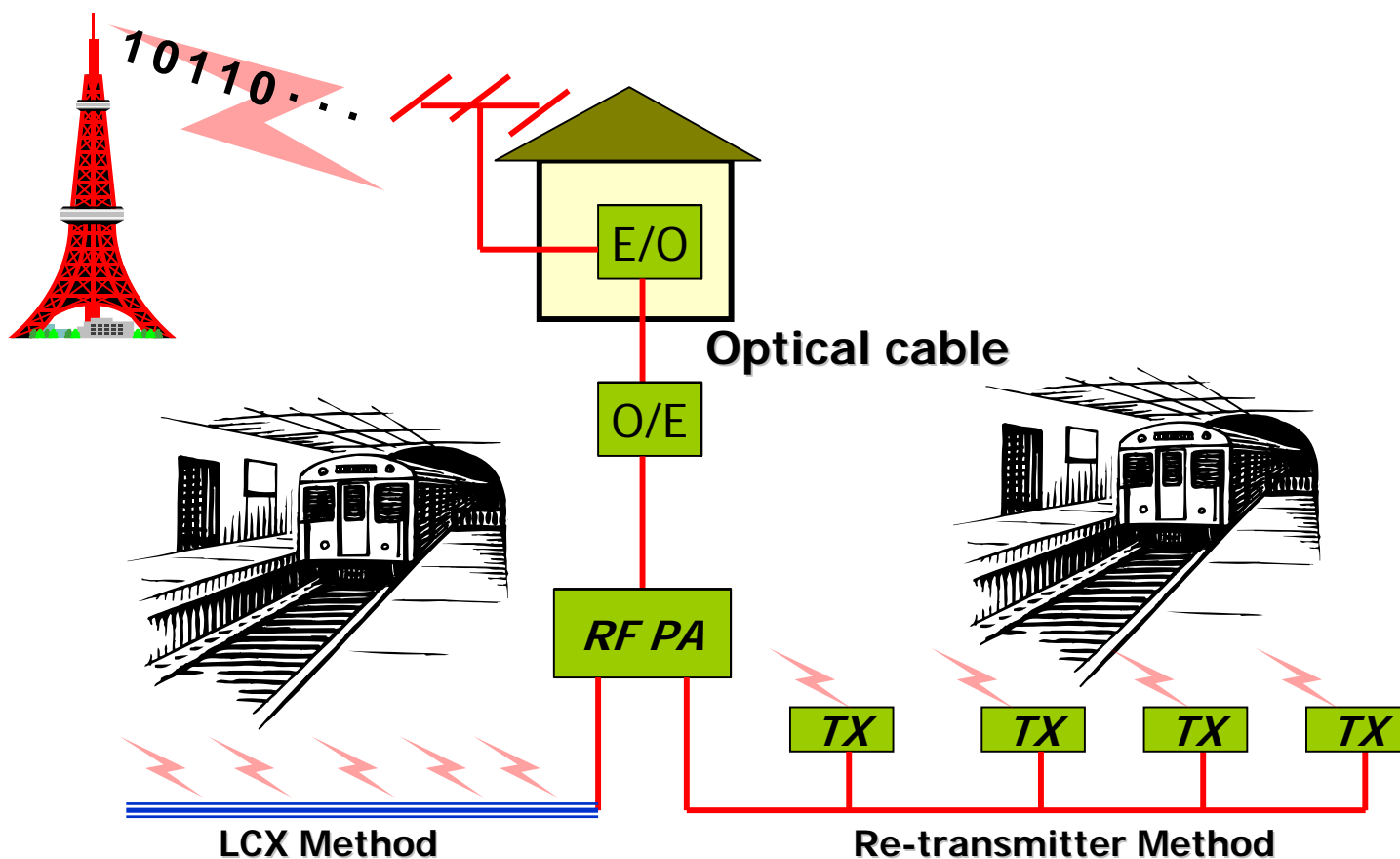
## *Access test in two Methods*

- Deployment of multiple re-transmitters
- Laying LCX, leakage coaxial cable



# *One-Seg service in a subway car (4)*

## *Conceptual diagram on the test methods*



## *One-Seg service in a subway car (5)*

### *Conclusion*

- More than 80% of reception rate was accomplished with re-transmitters with the power of less than 1W located 300m intervals through the tunnel.
- The method of multiple re-transmitters is cheaper than the method of LCX.

# *One-Seg service in a subway car(6)*

Antenna for re-transmitter mounted on the ceiling of station



Reception antenna for re-transmission located within the car



# *One-Seg service in a subway car(7)*





# ***Local government service on DTTB (1)***

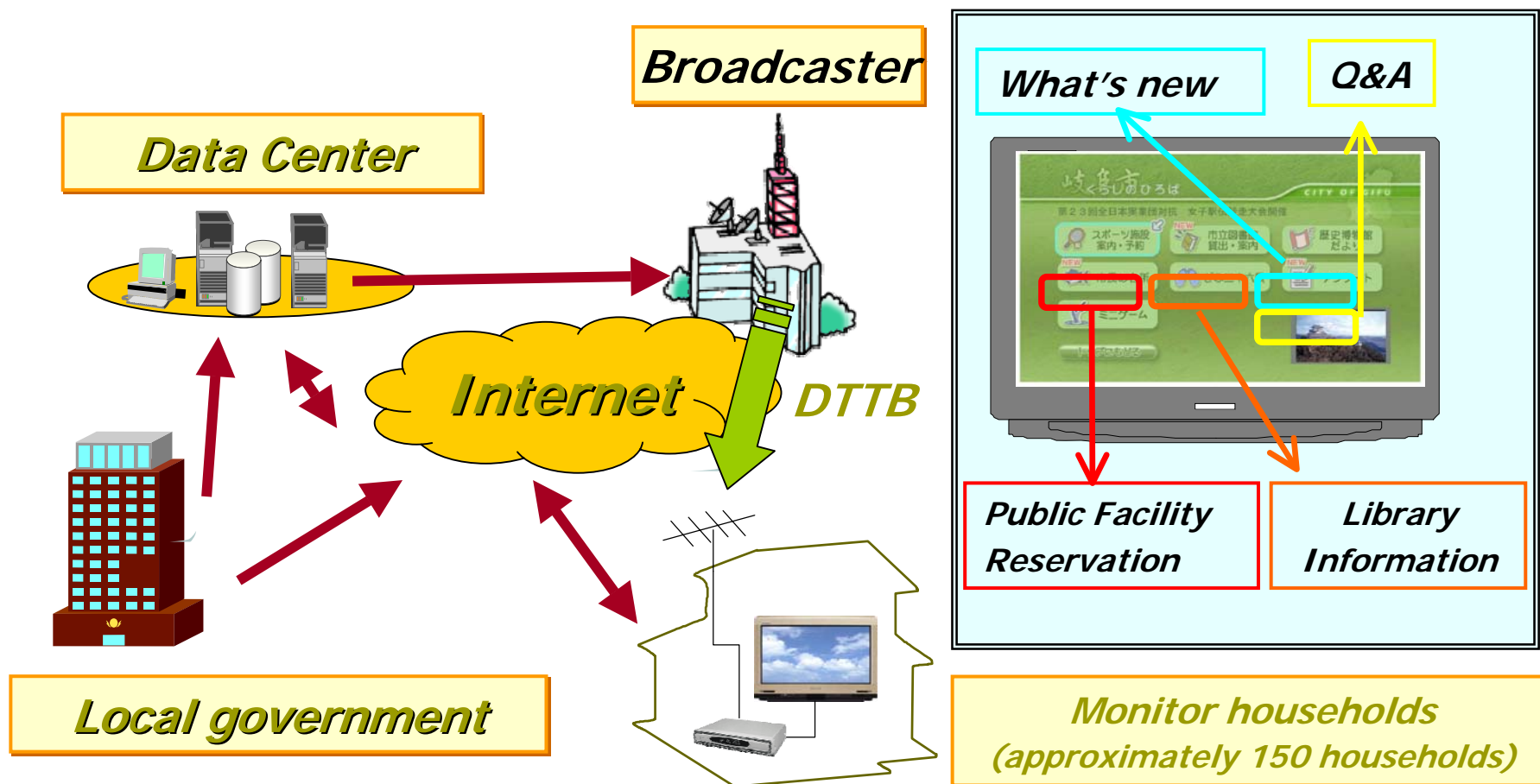
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## **Background**

- (1) Integrated service of DTTB/Communication is considered as a tool for administrative services.**
- (2) Gifu prefecture, central area of Japan, carried out an experimental test in Feb. 2004 to evaluate effects of the integrated service with DTTB/Communication for local government community services.**
- (3) The local government, local public organizations, communication carrier, broadcasters and MIC participated in this experimental test.**

# Local government service on DTTB (2)

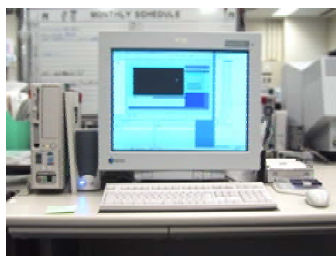
## Outline of local government information service on DTTB



# Local government service on DTTB (3)

## Data editing flow & transmission image

### Data editing & Pre-view



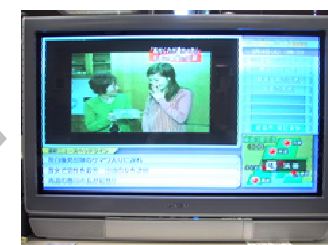
Main Terminal



Pre-view &amp; Transmission



DTTB Tuner



Receiver

### Image of data broadcasting transmission

#### Carousel Transmission

#### Text data

陸自後発部隊のサマワ入りに遅れ  
放火で男性を殺害 出頭した女を逮捕  
再選の豊田市長が初登壇...

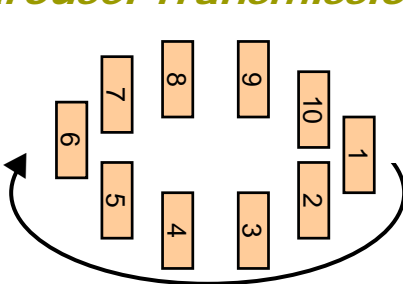
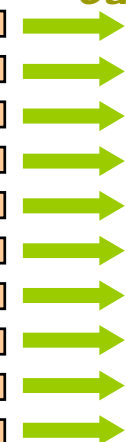
#### Picture data



BML

```
<body id="body">
<div id="divtv" class="tv">
<object class="video" id="video"
<object class="audio" id="audio"
</div>
<div id="op_box">
<div id="logo_box"> ...
```

Packetize



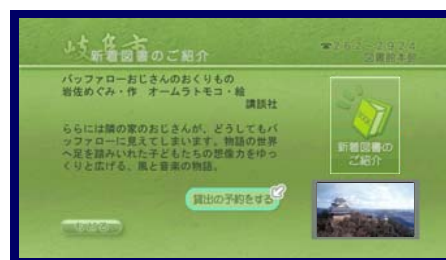
Receive all packets  
and decode



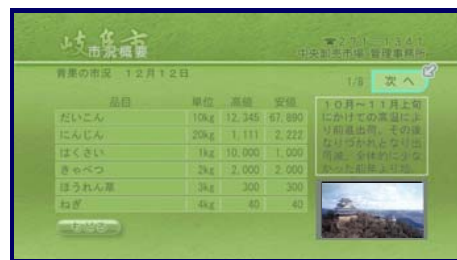
# Local government service on DTTB (4)

## Example of data broadcasting carousel contents

1. Guide & reservation of sports facilities
2. Guide & rental service of the library
3. Information on the library



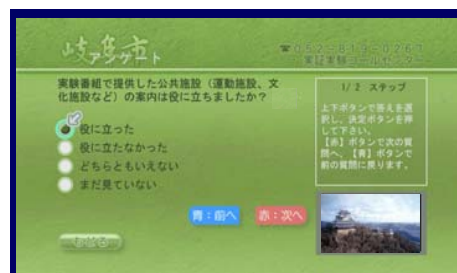
4. Information on the food market



5. Sightseeing guide



6. Questionnaire



7. Mini-game



# ISDB-T seminar in Jakarta

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*Thank you  
for your attention !*

*END*

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