Digital Terrestrial Television

ISDB-T advantage for the Philippines
(Integrated Services Digital Broadcast – Terrestrial)
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General Considerations for the selection of a DTV Standard

• The Philippines will be undergoing a “Transition” process until such time that the full “Migration” date has been determined by the Regulator.
• The Chosen DTV standard must not affect or upset the current status quo.
• The DTV standard must provide superior TV signal compared with analog NTSC.
• DTV is not a new application rather an improvement of analog broadcast technologies that should provide a better viewing experience for the people.
• DTV is a technology that should serve the interest of the people.
Analog TV Frequency allocation

**VHF BAND**

- Ch2
- Ch3
- Ch4
- Ch5
- Ch6
- Ch7
- Ch8
- Ch9
- Ch10
- Ch11
- Ch12
- Ch13

**UHF BAND**

- Ch14
- Ch15
- Ch16
- Ch17
- Ch18
- Ch19
- Ch20
- Ch21
- Ch22
- Ch23
- Ch24
- Ch25
- Ch26
- Ch27
- Ch28
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- Ch46
- Ch47
- Ch48
- Ch49
- Ch50
- Ch51

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Proposed Transition Band - Ch.14-19 for National Broadcaster

Proposed Transition Band - Adjacent channel UHF for Regional Broadcaster
Background of Digital Television in the Philippines

- Transition to Digital TV broadcast should provide a superior service to the people.
- It should provide a better viewing experience whenever and wherever so desired.
- It must pave the way for a more efficient utilization of spectrum.
- It should preserve the current broadcast “Status Quo”
- It should continue to provide fast, accurate, reliable and free information to the Public as it has been in the analog TV broadcast.

DTV service in the Philippines is envisioned to undergo a two stage process,

1. Transition
   - Parallel broadcast of Analog TV broadcast with Digital TV broadcast.

2. Migration
   - Analog broadcast shut-off and full Digital TV broadcast.
ISDB-T has all of this feature incorporated in the standard.
Data Broadcasting

All DTTB Broadcasters and BS Broadcasters providing Data broadcasting (datacast) now

Program related information
Weather information
Anytime news
Report of sports game etc,

Currently the description language is BML format

Based on

Features
Easy creation of contents
Facilitate convergence of internet

Additional capability
Example for Datacasting(1)

Top menu
Example for Datacasting(2)

Weather news

[Image of a weather news interface]
Example for Datacasting(3)

Program related data
Possibility of river flooding has increased. Residents near the river 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)

**Activate!**

Evacuation Instructions

Both in and outside the home.
Emergency Warning Broadcast System

Receive only EWS Signal

Tsunami warning issued

Wake-up handheld receiver

Emergency warning broadcast

The system does not employ FFT, but instead stays on stand-by for the EMS signal component.

Low power consumption stand-by mode

Active mode to receive emergency warning broadcast
Between a Full-Seg receiver and a One-Seg receiver, the basic configurations are about the same, though there are some differences such as a tuner, video decoder, resolution of display and so on.

RF : Radio Frequency
IF : Intermediate Frequency
TS : Transport Stream
Demux : Demultiplexer
NVRAM : Non-volatile RAM
1. **Relationship between Japan/Brazil ISDB-T system**
   (1) As shown in receiver composition, hardware difference is only “Video Decoder” portion. Datacasting is based on software.
   (2) Common hardware can be used for “Front End” (6MHz BST-OFDM)
   (3) Japan/Brazil ISDB-T is family, so many component can be used for both systems

2. **Relationship between ISDB-T/DVB-T system**
   (1) As shown in receiver composition, hardware difference is only “OFDM demodulator” portion. **The composition of Backend basically depends on the service quality/performance.**

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**ISDB-T receiver block diagram**

- **Front End**
  - TUNER
  - OFDM Demodulator

- **TS Decoder/Demux**
  - AAC
  - MPEG2
  - H.264

- **Audio Decoder**

- **Video Decoder**

- **Display Processing**

- **System Bus**

- **Key**

- **Remote Controller**

- **I/O**
  - NVRAM (Flash mem)
  - ROM (Font, etc.)
  - RAM (main memory)

- **CPU**

- **Communication I/F**

- **Flow of signal and data**

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**Key**
- Different component for Japan/Brazil system
- Different component for ISDB-T/DVB-T system
| * Background                      |
| * Technical Parameters           |
| * Technical Features             |
| * Receivers                      |
| * Studies elsewhere              |
| * Market Projections             |
| * Strength of ISDB-T             |
## Comparison between Three Systems

<table>
<thead>
<tr>
<th>Item</th>
<th>ATSC</th>
<th>DVB-T</th>
<th>ISDB-T</th>
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<tbody>
<tr>
<td>Modulation</td>
<td>8VSB-AM</td>
<td>OFDM</td>
<td>BST-OFDM</td>
</tr>
<tr>
<td>Hierarchical transmission</td>
<td>Non</td>
<td>Non</td>
<td>Yes</td>
</tr>
<tr>
<td>Time interleave</td>
<td>Non</td>
<td>Non</td>
<td>Yes</td>
</tr>
<tr>
<td>Mobile &amp; portable</td>
<td>Non</td>
<td>DVB-H, Separate Std. (Needs other frequencies)</td>
<td>One-seg(more than 20,000,000 was sold)</td>
</tr>
<tr>
<td>Artificial noise</td>
<td>Poor</td>
<td>Poor</td>
<td>Excellent</td>
</tr>
<tr>
<td>HDTV</td>
<td>Yes</td>
<td>Non</td>
<td>Yes</td>
</tr>
<tr>
<td>Data Broadcasting</td>
<td>Non</td>
<td>(MHP), MHEG5</td>
<td>BML(more than 30,000,000 receivers)</td>
</tr>
</tbody>
</table>
Results of Mobile Reception In Singapore

Comparison tests between DVB-T and ISDB-T

DVB-T
ISDB-T, 2sec
DVB-T
DVB-T: many impossible places
The Comparison Test in Chile

Indoor: Grade "5"

Cumulative reception rate (%)

Distance (km)

Cumulative reception rate (

Distance (km)

- ISDB-T
- ATSC
- DVB-T
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<td>* Receivers</td>
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<td>* Figurative illustration of DTV Coverage</td>
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<td>* Market Projections</td>
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<tr>
<td>* Strength of ISDB-T</td>
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ISDB-T transmission in Tokyo

Transmitter Power = 10 KW
Antenna Configuration = 8 Level, 24 phases
DVB-T in Singapore
Mega-Manila
Scenario

• Broadcast SDTV now broadcast HDTV later:
  - Broadcaster
    - Invest in SD infrastructure and later invest again in HD infrastructure.
  - People
    - Buy SD STB and then replace again with new HD STB.

  **No Compelling reason for the people to migrate to Digital!**

• Broadcast HDTV Now
  - Broadcaster
    - Invest in HD infrastructure one time.
  - People
    - Buy HD STB is compatible with SD STB

  **People will be interested to buy DTV receiving equipment.**
<table>
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<tr>
<th>RECEPTION TYPE</th>
<th>ATSC</th>
<th>DVB</th>
<th>ISDB-T</th>
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<tbody>
<tr>
<td>FIXED ROOFTOP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PORTABLE/ MOBILE</td>
<td>A-VSB/ MPH</td>
<td>Impulse Noise Problem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Under development)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HANDHELD</td>
<td>A-VSB/ MPH</td>
<td>DVB-H Infrastructure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Under development)</td>
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</tbody>
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VIDEO DEMONSTRATION OF ISDB-T RECEPTION

- Inside the Van and Car mobile HDTV reception
- Inside the Car mobile HDTV reception in an underpass
- Handheld reception inside a train running at 80kph
- Handheld reception in basement 2
- Field experiment in Mito, Hitachi, Yamagata Prefecture
For additional information and download of presentation slides around the world please go to:

www.dibeg.org

Thank you for your attention