



Terrestrial Digital Television Receiver Based on DTMB

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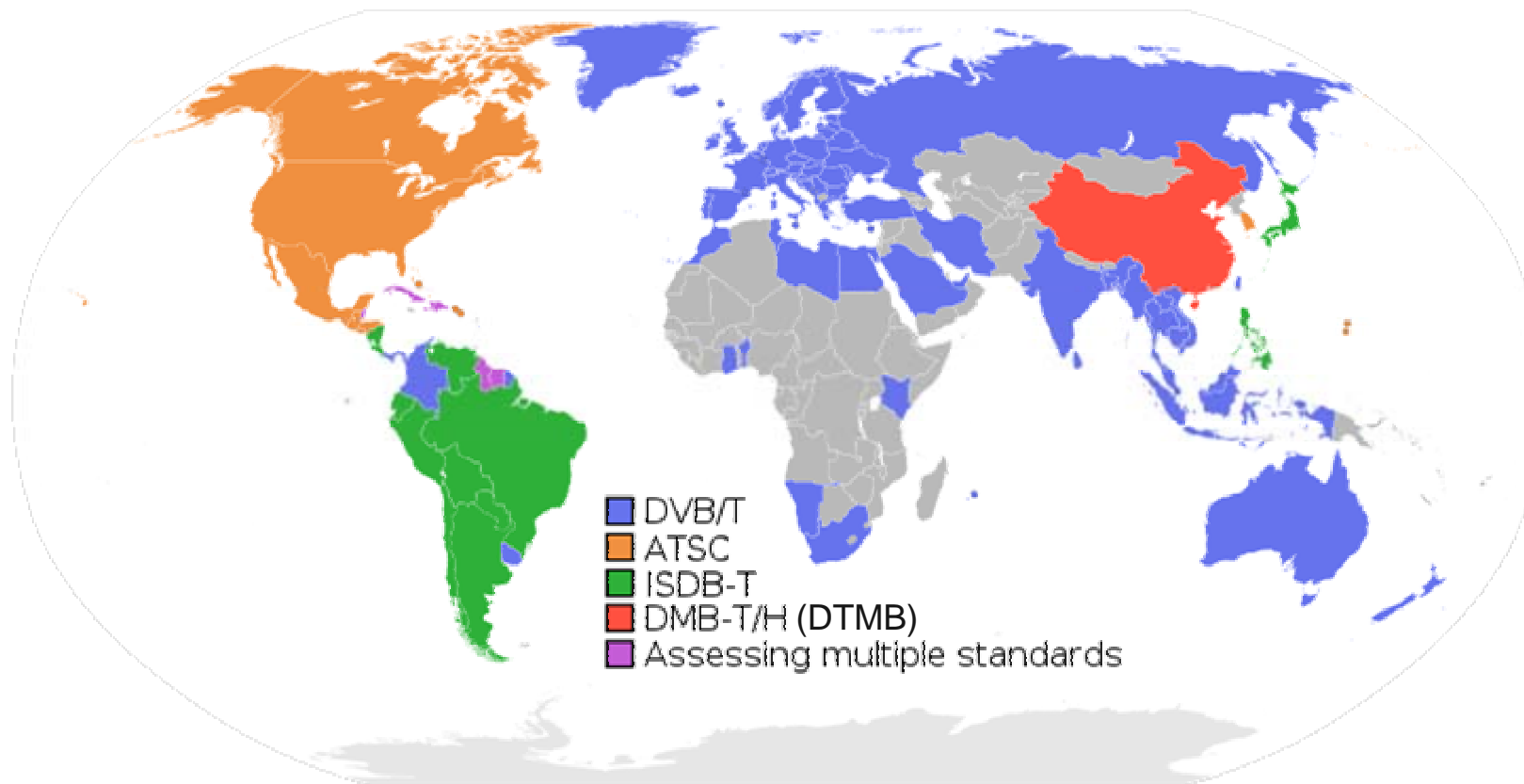
International DTTB standard



❖ Digital Television Transmission Broadcasting standard in the world

- DVB-T (Europe)
- ATSC (North America)
- ISDB-T (Japan)
- DTMB (China)

International DTTB standard - map



Map of Digital Terrestrial Television Broadcast standards
(Download from <http://en.wikipedia.org>, Aug, 2010)

DTMB Standard Introduction - History



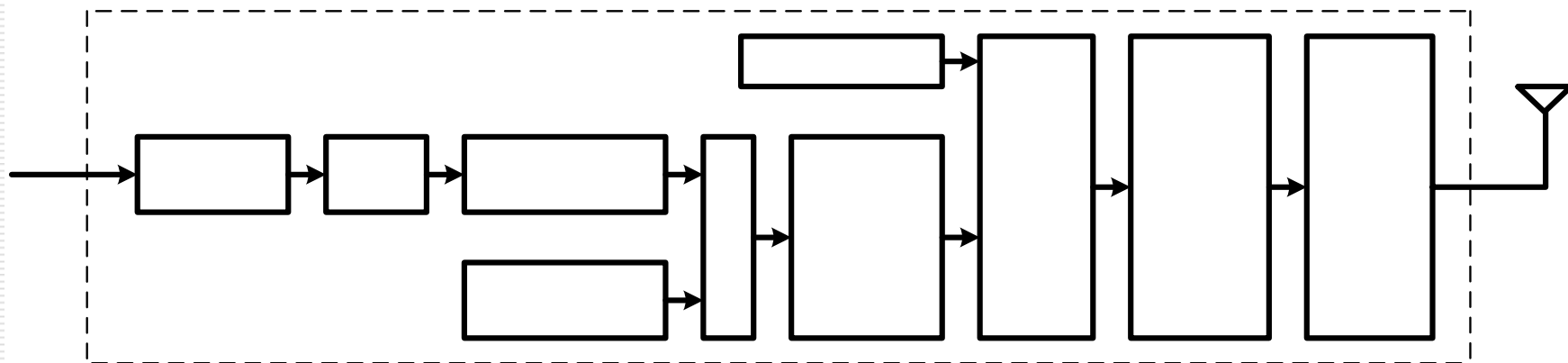
❖ Brief history of DTMB:

- 1994, China initiated the research efforts in DTV standard;
- 2001, Chinese government called for proposals of Chinese DTTB standard;
- 2003, Lab test as well as field trial for proposals were conducted;
- In Aug 2006, the DTMB standard was published. It became mandatory in China after Aug 1, 2007.

DTMB Standard Introduction - Overview



- ❖ Digital Terrestrial/Television Multimedia Broadcasting (DTMB, published in Aug 18, 2006, GB 20600-2006)
- ❖ Framing structure, channel coding and modulation for digital television terrestrial broadcasting system



Block Diagram of DTMB Modulation



❖ DTMB features

- Using TDS-OFDM (Time-Domain Synchronous OFDM) instead of CP-OFDM (Cyclic Prefix-OFDM);
- Taking Concatenation of BCH and LDPC instead of concatenated RS and convolutional code;
- Adopting long time interleaver;
- Supporting both single-carrier and multi-carrier.

DTMB Standard Introduction - Specification



System	ATSC	DVB-T	ISDB-T	DTMB
Bandwidth	6MHz	6/7/8MHz	6/7/8MHz	8MHz
Video Coding	MPEG-2	MPEG-2	MPEG-2	MPEG-2/AVS
Audio Coding	AC3	MPEG-2	MPEG-2	MPEG-2/DRA
Outer Coding	RS(207,187)	RS(204,188)	RS(204,188)	BCH
Inner Coding	Trellis 2/3	Convolution	Convolution	LDPC
Modulation	8-VSB	COFDM	COFDM	TDS-OFDM
Carriers	1	1705/6818	1405/2809/56 17	1/3744
Bit Rate	19.39Mbps	4.98M ~ 31.67Mbps	3.65M ~ 30.98Mbps	4.813M ~ 32.486Mbps
SFN	No	Yes	Yes	Yes
SDTV/HDTV	Yes	Yes	Yes	Yes
Hardware	Simple	Complex	Complex	Complex

DTMB Application



❖ Digital Terrestrial Television application in China

- Before the 2008 Olympic Games, 6 Olympic cities and 2 major cities began DTMB broadcasting:
 - Beijing, Shanghai, Tianjin, Qinhuangdao, Qingdao, Shenyang, Guangzhou, Shenzhen
- After the 2008 Olympic Games, promotion of terrestrial digital television is divided into two stages:



DTMB Application



❖ Countries and territories using DTMB (Until Sep, 2010)

-  China
-  China Hong Kong
-  China Macau
-  Laos
-  Cambodia
- Some countries in Asia, Africa are in research and cooperation stage

New Proposal Recommendation - Framework



General Requirements

- Normal Conditions
- Symbols
- Appearance & Structure
- Interfaces

Receiver Capabilities

- Demodulator & Decoder
- Demultiplexing
- AV features
- Power flexibility
- Functions
- Remote Control
- Electromagnetic
- Safety & Reliability
- etc.

Test Method

- Symbols & Appearance
- Demodulator & Decoder
- Demultiplexing
- AV features
- Power flexibility
- Functions
- Remote Control
- Electromagnetic
- Safety & Reliability
- etc.

New Proposal Recommendation - Stream



- ❖ Requirement of Transport Stream
 - Format of Transport Stream
 - Consistent with ISO/IEC 13818-1
 - Interface comply with ETSI ETR 154
 - Video Coding
 - ISO/IEC 13818-2(MPEG-2)
 - AVS (Chinese standard)
 - specified frame rate as 25Hz, 4:3 and 16:9 ratio
 - Audio Coding
 - MPEG-1 Layer II
 - IEC 61937-12 (DRA)
 - ETSI TS 102366 (AC3) or other digital audio stream



❖ Test Methods

- Symbols and Appearance
- Demodulator & Decoder
- Demultiplexing
- Audio and Video features
- Power flexibility
- Functions
- Remote Control
- Electromagnetic
- Safety and Reliability
- Packaging
- Assembly process



Thanks for your attention.