

Proposal of PHY Specification for 5 GHz Band

-Outline of Proposal-

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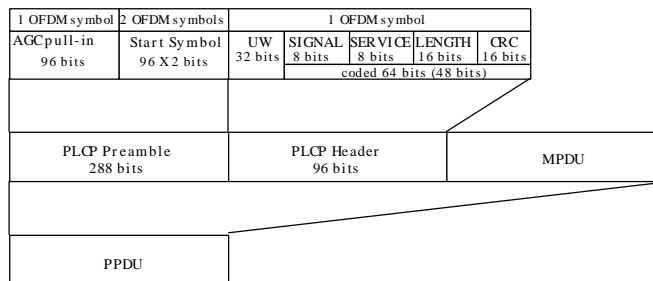
Contents

- PLCP Specification
 - Frame Format
 - Convolutional Encoding
 - TX Procedure
 - RX Procedure
- PMD Specification
 - Spectrum Allocation
 - Interleaving
 - DQPSK-OFDM

Function of PLCP

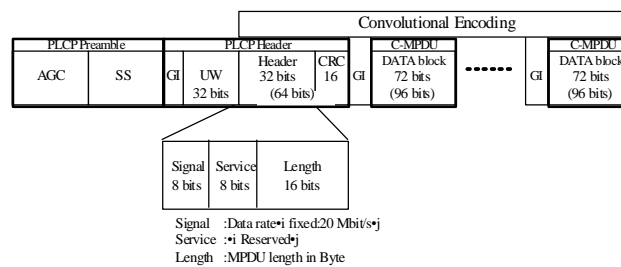
- MPDUs are converted to PPDU and vice versa
- PLCP preamble and header are generated
- Convolutional encoding / Viterbi decoding is performed
- Bit stuffing / removing for a consistent OFDM frame
- Scrambling / De-scrambling

PLCP Frame Format (1)



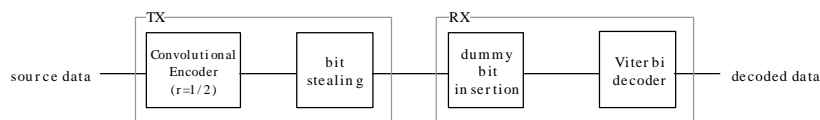
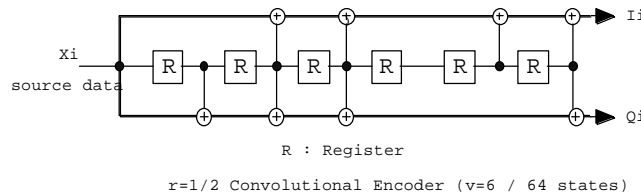
PLCP Frame Format (2)

- PLCP preamble consists of AGC-pullin and Synchronization Symbols
- The header, CRC and MPDUs are protected by FEC (Convolutional encoder / Viterbi decoder)

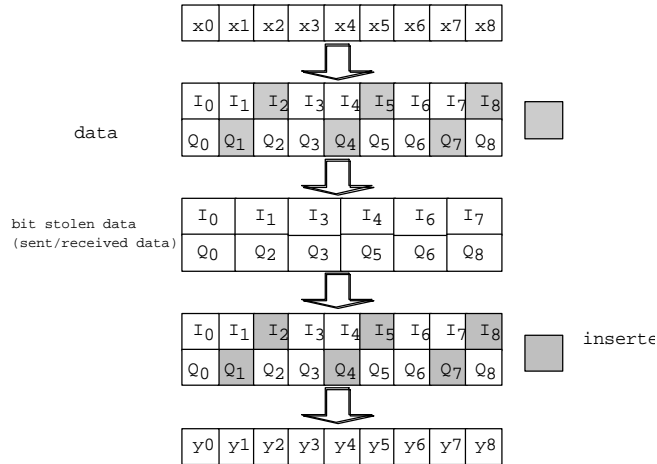


Convolutional Encoder

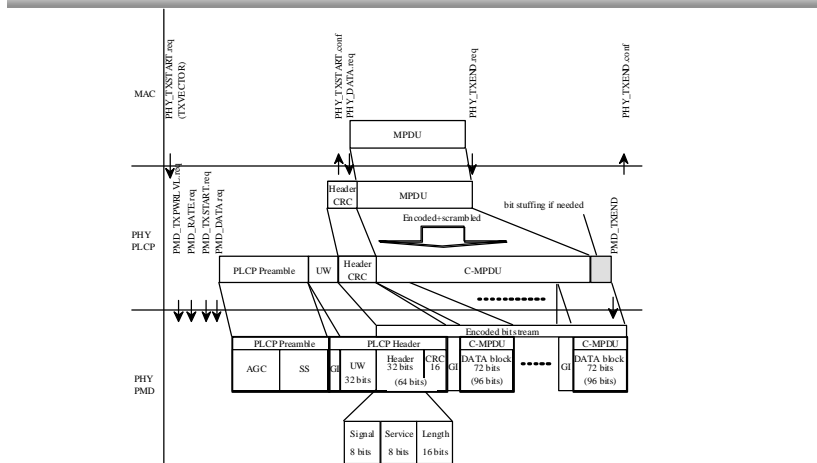
- A half rate ($r=1/2$) encoder is used
- Punctured technique offers rate of $3/4$



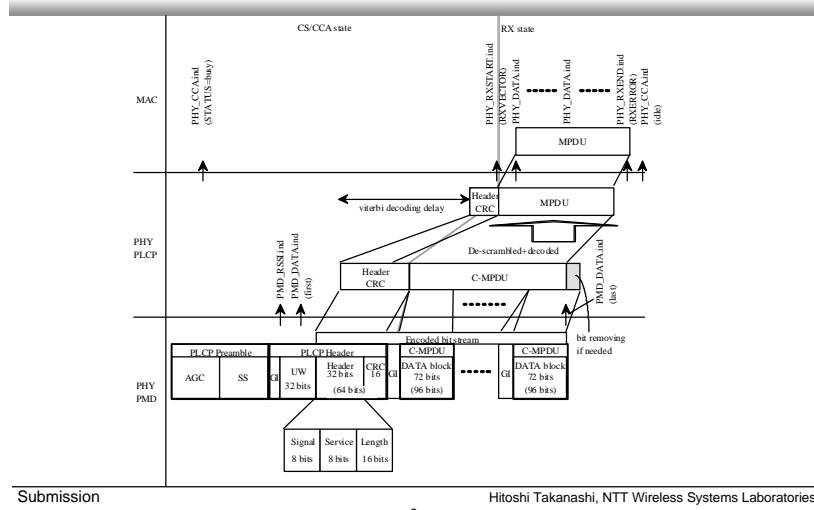
Bit Stealing and Insertion of Punctured coding



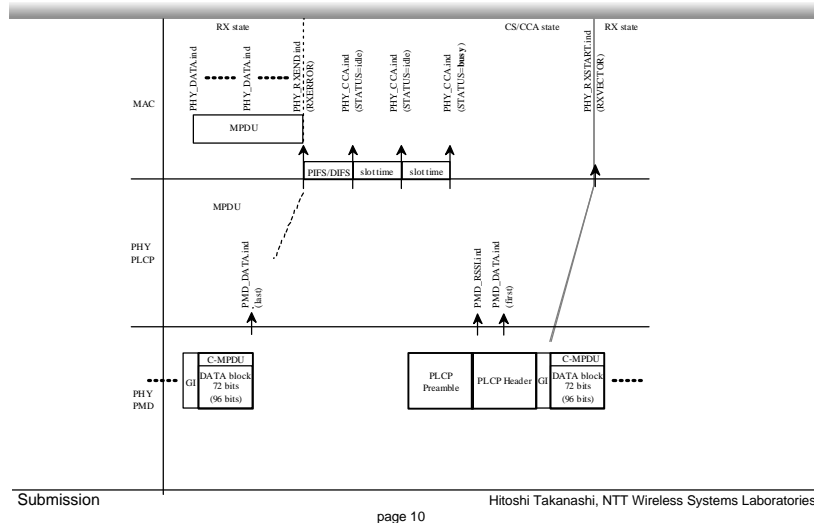
PLCP Transmit Procedure



PLCP Receive Procedure



Clear Channel Assessment



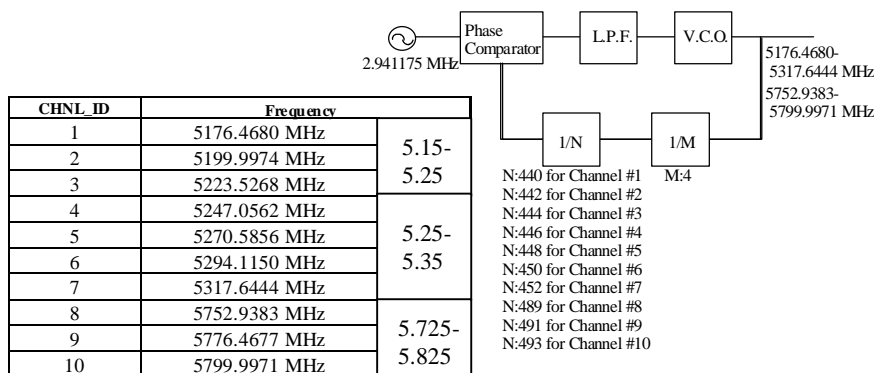
Function of PMD

- Sending / Receiving MPDUs
 - Modulation / Demodulation
 - Raised cosine windowing
 - TPC
- G.I. Insertion (Cyclic extension)
- Synchronization (AGC+OFDMsymbol+clock)
- Interleaving / De-interleaving

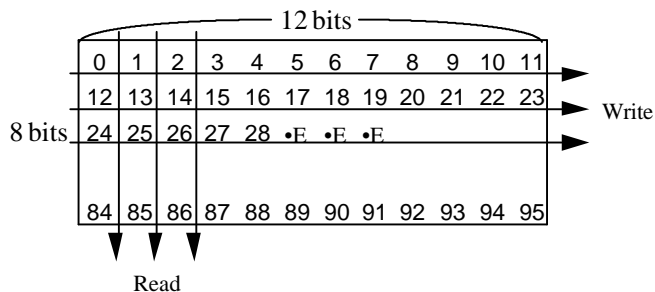
Major Parameters

Information data rate	20 M bit/s
Modulation	DQPSK-OFDM
Coding rate	3/4
Number of subcarriers	48
OFDM symbol duration	3.6 μ s
Guard interval	0.86 μ s * ($T_G + T_{\text{prefix}} + T_{\text{postfix}}$)
Occupied Bandwidth	17.5 MHz

Carrier Frequency Allocation



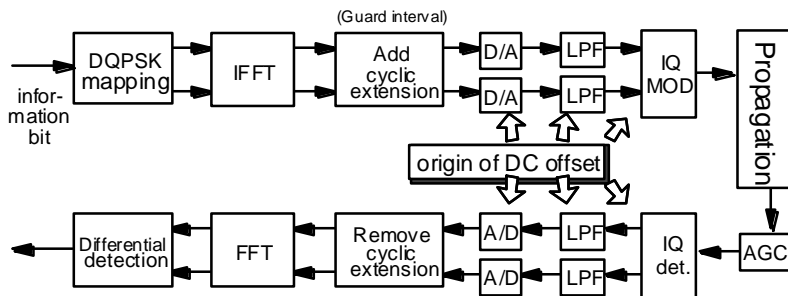
Interleaving (in an OFDM symbol)



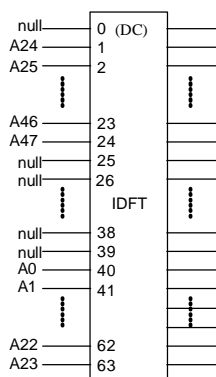
The intra-OFDM symbol interleaving shall be performed to randomize the successive error bit pattern for convolutional encoding. The interleaving procedure is carried out before DQPSK mapping. The interleaving procedure is shown in this Figure.

DC Offset

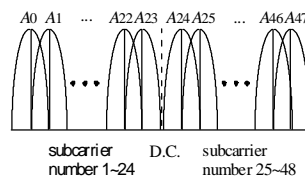
- Imperfection causes DC spectrum



Subcarrier Allocation

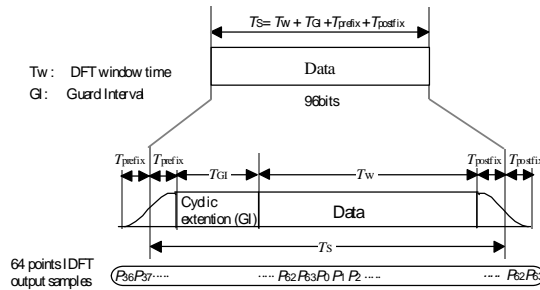


- The center carrier interfered by the DC offset is not used.



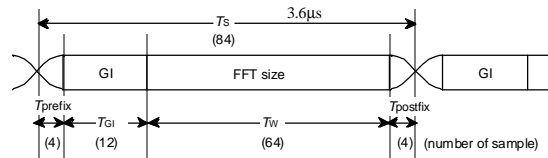
Guard Interval

- The G.I. consists of cyclic extension



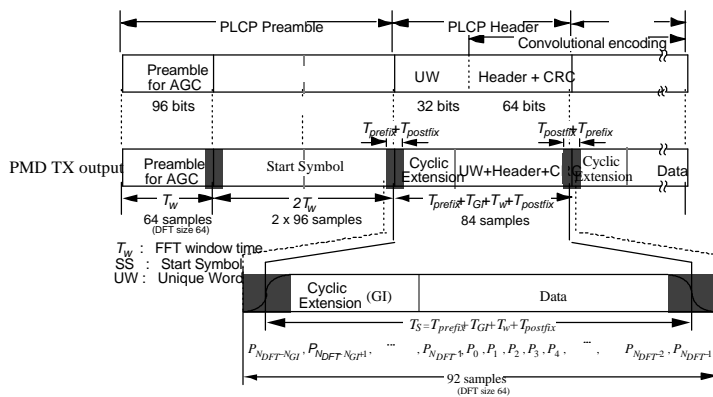
Raised cosine windowing

- This windowing is used for reduction of ACI



FFT Points	64
Guard Interval (GI)	12
Prefix Points	4
Postfix Points	4

OFDM Frame Format



Transmit Spectrum Mask

- This mask shall be defined by regulation

