

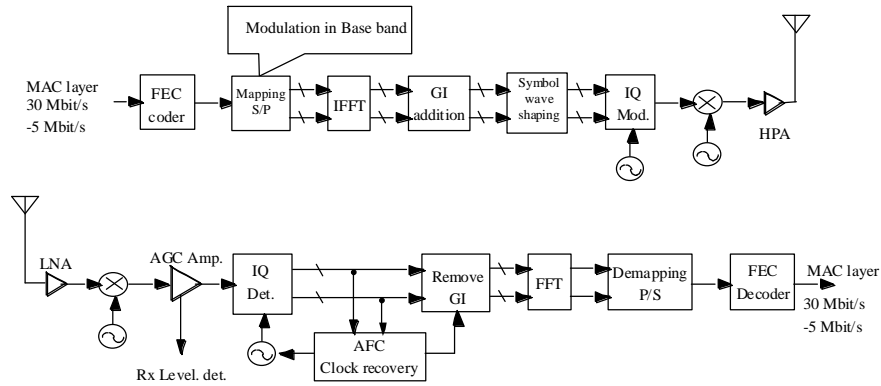
## Outline of Draft Standard for 5 GHz

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Lucent + NTT

## Advantages of OFDM

- Robust against delay spread
- No feed back loop : stable
- Any modulation schemes can be applied to the base band modulation. Same spectrum shape is found.
- Fall back function is supported
- Same PHY as BRAN's would be possible
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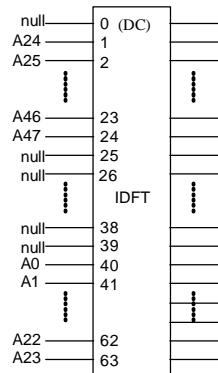
## Configuration of PHY



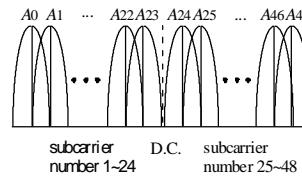
## OFDM Parameters

- 48 sub-carriers in 12.5 MHz
- Center carrier is not used
- 64 points of FFT/IFFT
- Base band modulation :
  - DPSK, DQPSK and 16QAM
- 5 carriers in 100 MHz (15 MHz separation)
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## Sub-carrier Allocation



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

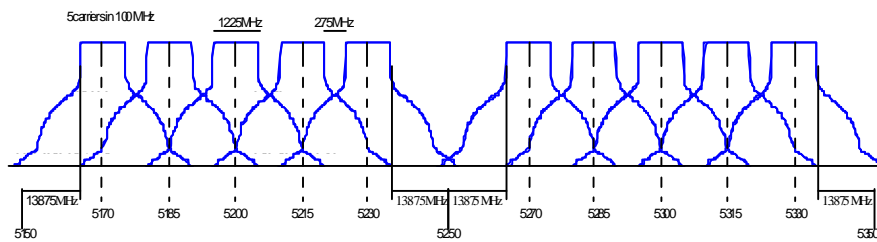


## Base band Modulation

- DBPSK and DQPSK
  - Differential coding for differential detection
  - DBPSK,  $r=1/2$  : 5 Mbit/s
  - DQPSK,  $r=1/2$  : 10 Mbit/s
  - DQPSK,  $r=3/4$  : 15 Mbit/s
  - Pilot carriers (#3, 26 and 47)
- 16 QAM
  - Pilot carriers (#3, 26 and 47)
  - $r=1/2$  : 20 Mbit/s

## Channelization in L & M band

- 10 carriers in 200 MHz band
- Guard band : 13.875 MHz to the band edge
- 15 MHz separation



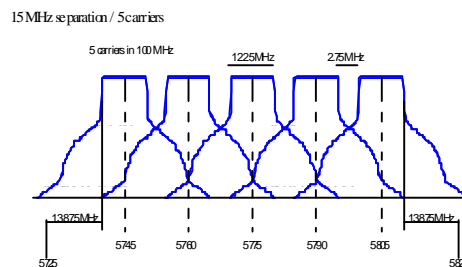
Submission

Slide 7

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## Channelization in Upper band

- Same as lower / middle band



Submission

Slide 8

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## Header Parameters

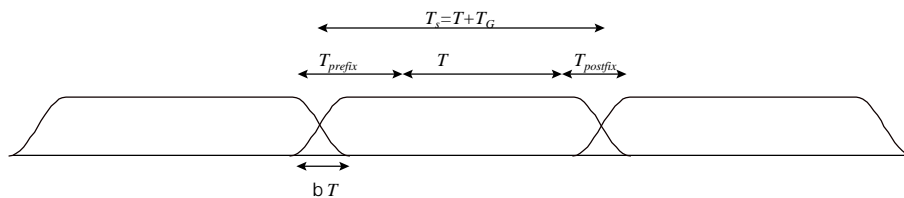
- Long Guard Interval is secured

$N_s$ : Number of subcarriers	48
$T_s$ : Symbol interval	4.8 $\mu$ s
$T$ : IFFT/FFT period	4.042 $\mu$ s ( $T_s \cdot 64/76$ )
$T_G$ : Guard time	758 ns ( $T_s - T$ )
$T_{prefix}$ : Pre-guard interval	758 ns ( $T_s - T$ )
$T_{postfix}$ : Post-guard interval	101 ns ( $0.025T$ )
$b$ : Roll-off factor	0.025

Table 87, OFDM parameters

## Cyclic Extention

- A raised cosine window to reduce out band power (roll off factor : 0.025)



# Training Symbols

- Short and Long symbols

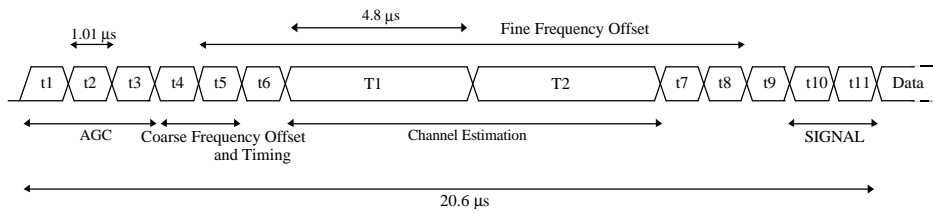
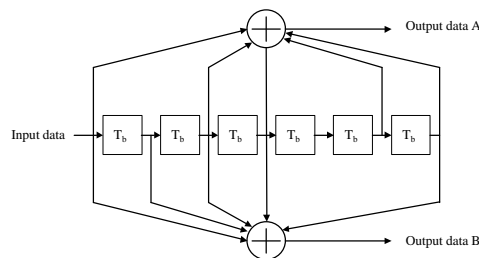


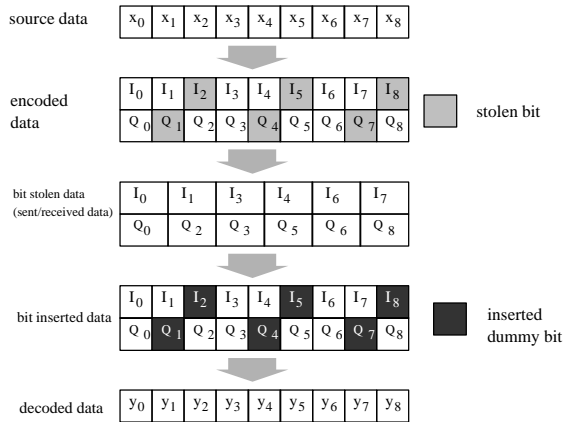
Figure 108, Training Structure

# Encoder

- 64 states convolutional encoder
- rate : 1/2 - 3/4 (punctured)

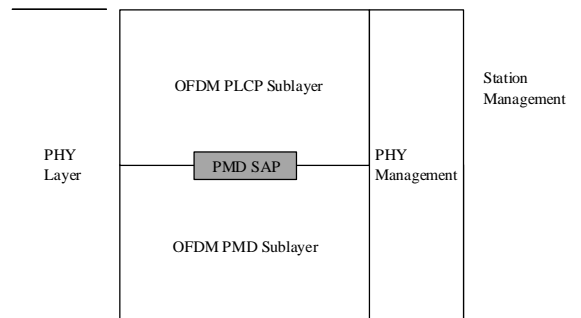


## Bit stealing/insertion

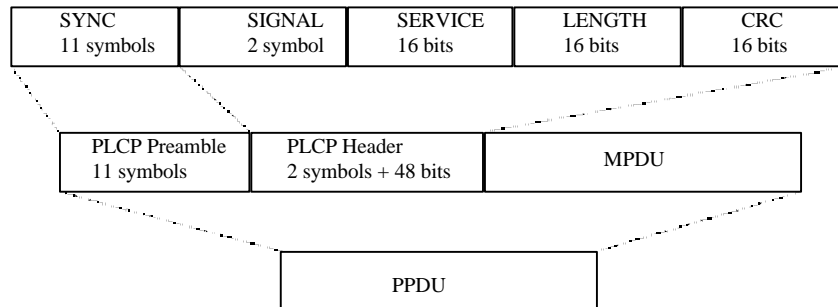


## Layer Reference Model

- As used in the current MAC
- New Primitive parameters are defined



## PLCP Frame Format



## Other Functions

- Bit stuff to make the MPDU length multiples of an OFDM symbol.
- Tail bits to set the convolutional encoder to a state.
- Scrambler to minimize the data DC offset.
- Interleave to enhance error correction function (within an OFDM symbol)