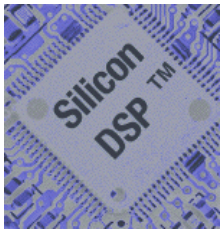
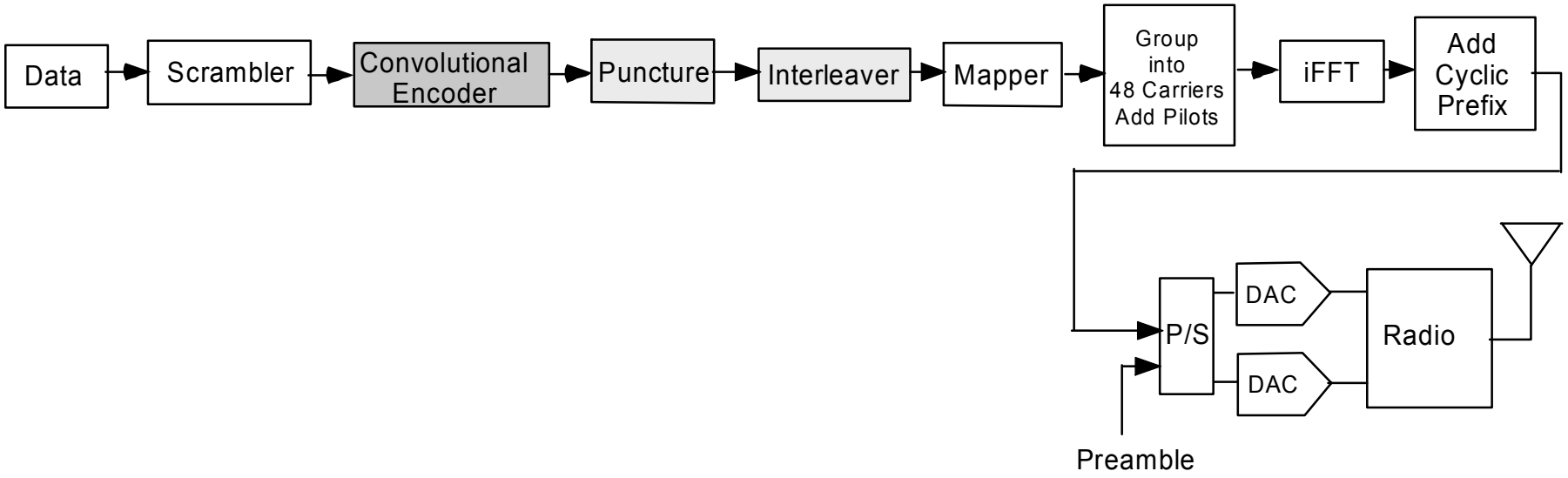
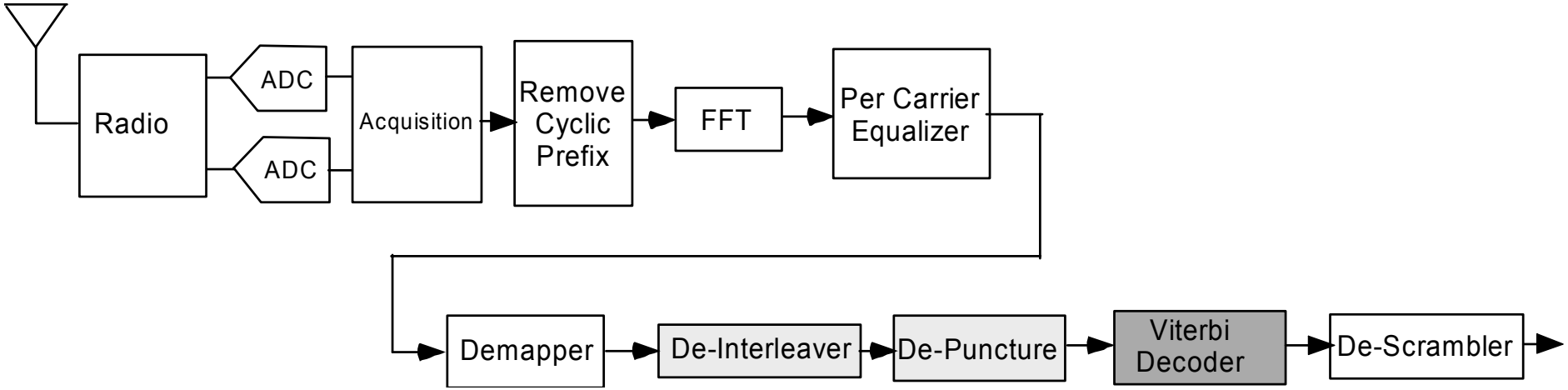
Puncturing

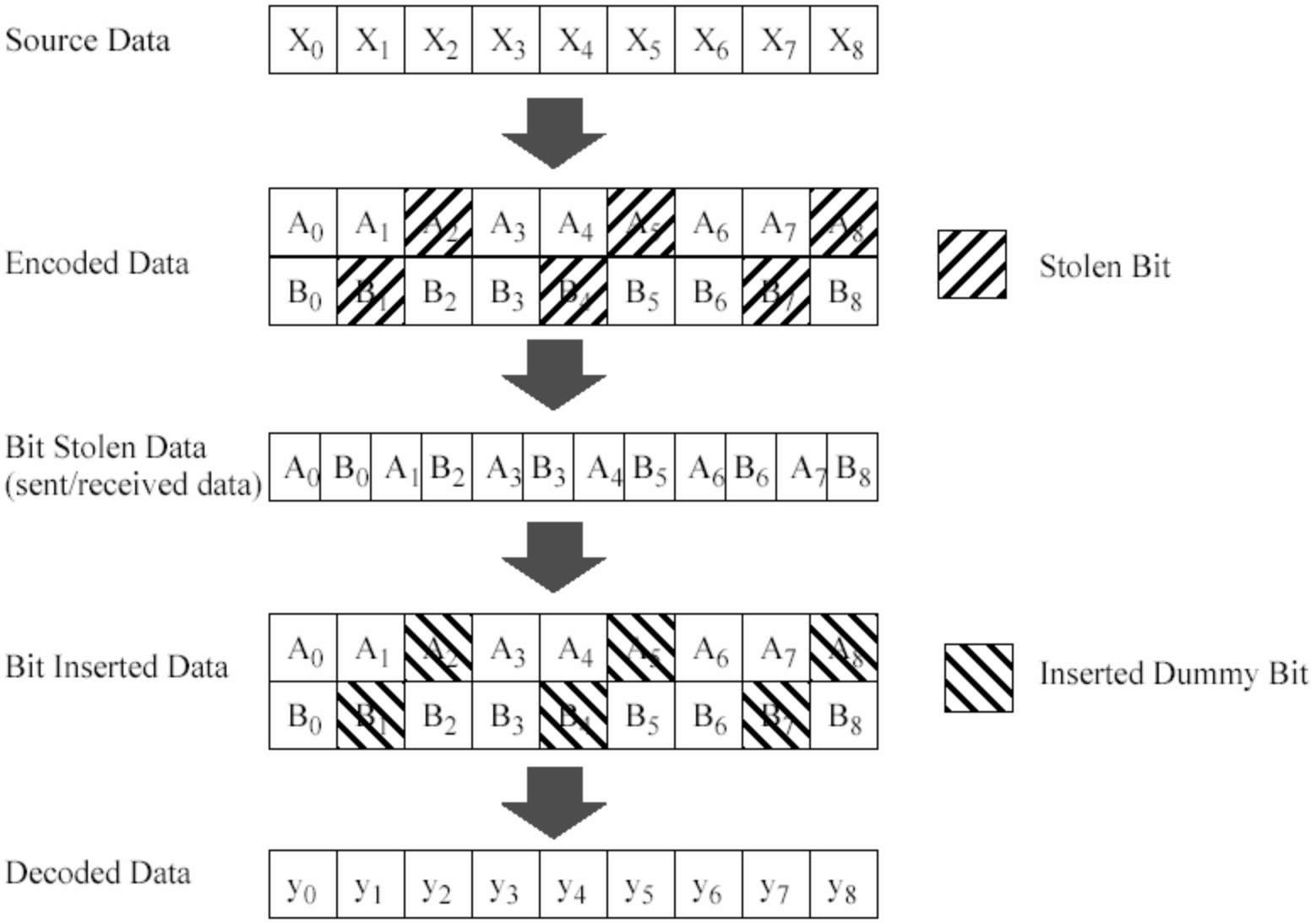


Silicon DSP Corporation



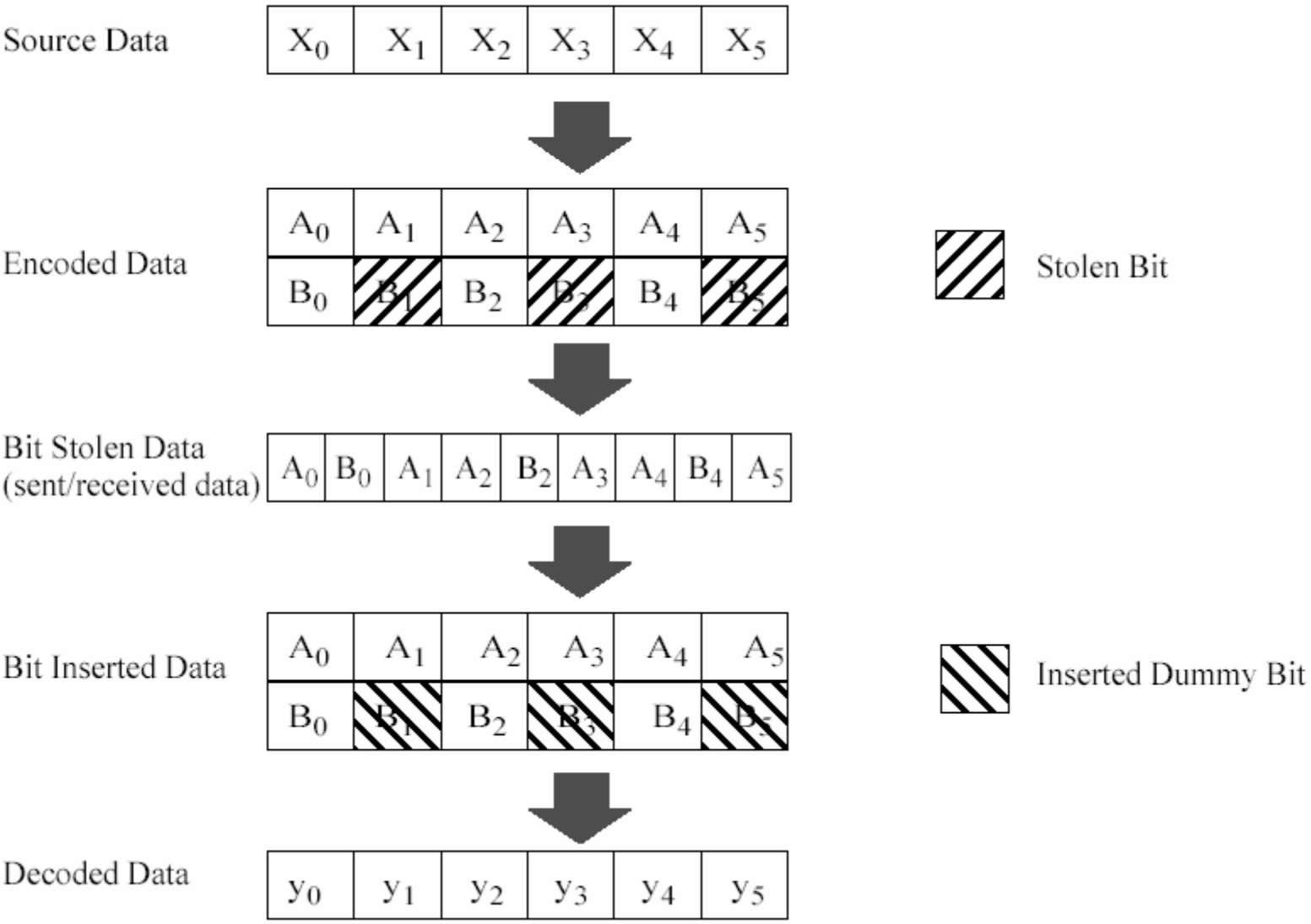


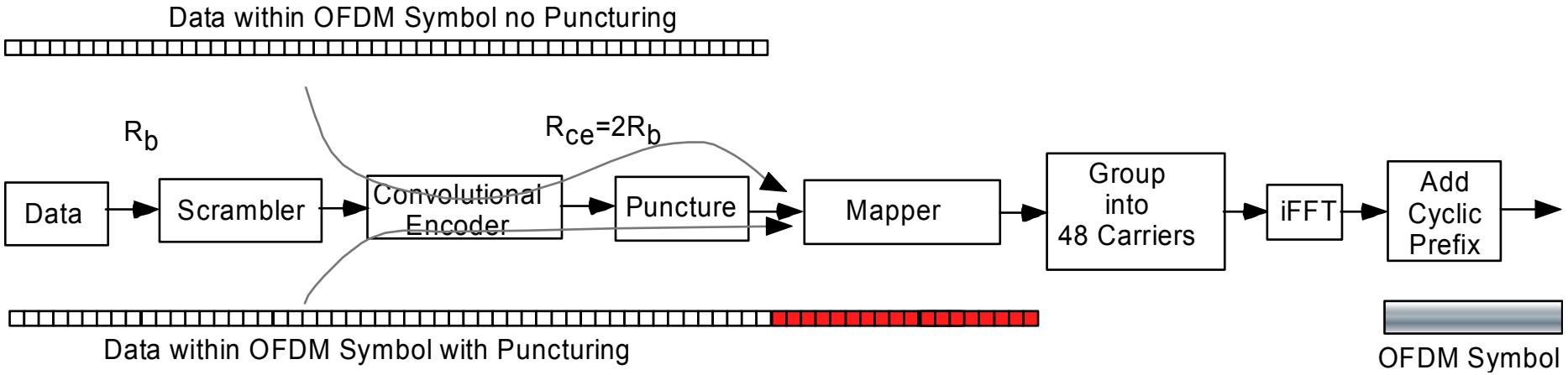
Punctured Coding (r = 3/4)



Src: IEEE 802.11a Standard

Punctured Coding (r = 2/3)





Convolutional Encoder Output

101011010101100010...1101...01101100 01

N_{CBPS} 288=6*48bits One OFDM Symbol

Punctured Input to Mapper

101110010100...1101...01101001

X_0 X_1 X_{47}

64 QAM

Dummy Bits Inserted Input to Viterbi Decoder

101011000100100010...1101...01101000 01

Data rate (Mbits/s)	Modulation	Coding rate (R)	Coded bits per subcarrier (N_{BPSC})	Coded bits per OFDM symbol (N_{CBPS})	Data bits per OFDM symbol (N_{DBPS})
54	64-QAM	3/4	6	288	216

288=6x48

Over the Air Bit Rate= 288/4μs= 72 Mbps

Over the Air *Data* Bit Rate= 216/4μs= 54 Mbps

Coding Rate = 54/72 = 3/4

Coding Rate = 216/288 = 3/4

Table 78—Rate-dependent parameters

Data rate (Mbits/s)	Modulation	Coding rate (R)	Coded bits per subcarrier (N_{BPSC})	Coded bits per OFDM symbol (N_{CBPS})	Data bits per OFDM symbol (N_{DBPS})
6	BPSK	1/2	1	48	24
9	BPSK	3/4	1	48	36
12	QPSK	1/2	2	96	48
18	QPSK	3/4	2	96	72
24	16-QAM	1/2	4	192	96
36	16-QAM	3/4	4	192	144
48	64-QAM	2/3	6	288	192
54	64-QAM	3/4	6	288	216

Issues

- High SNR
- Requires Longer Traceback Depth in Viterbi Decoder

Free Distance and Puncturing

	Code rates			
Rate	1/2	2/3	3/4	5/6
d_{free}	10	6	5	4

Table 116af

Source: 802.16a Table 116af