

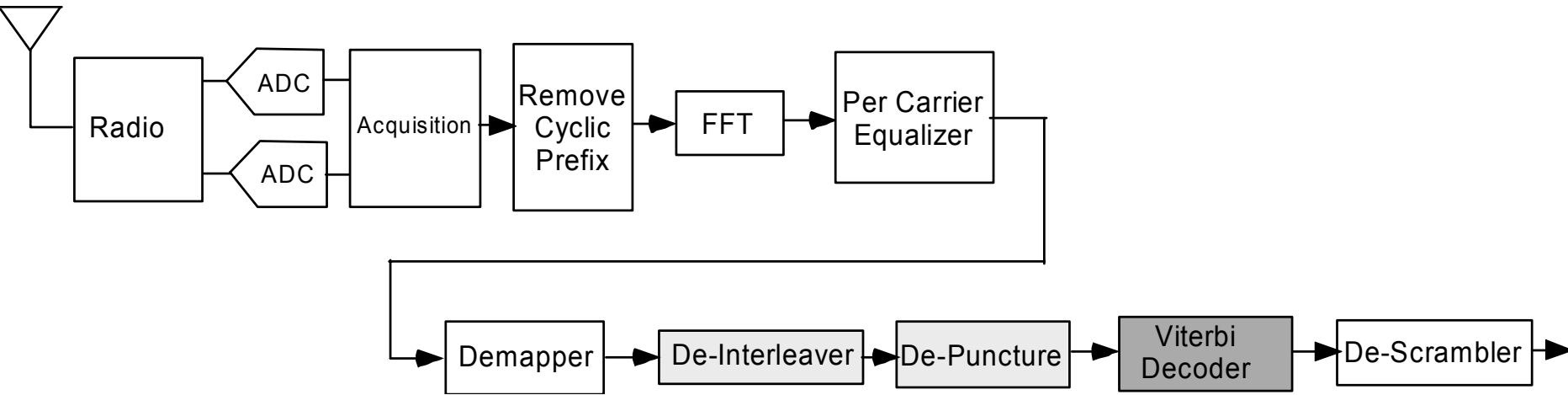
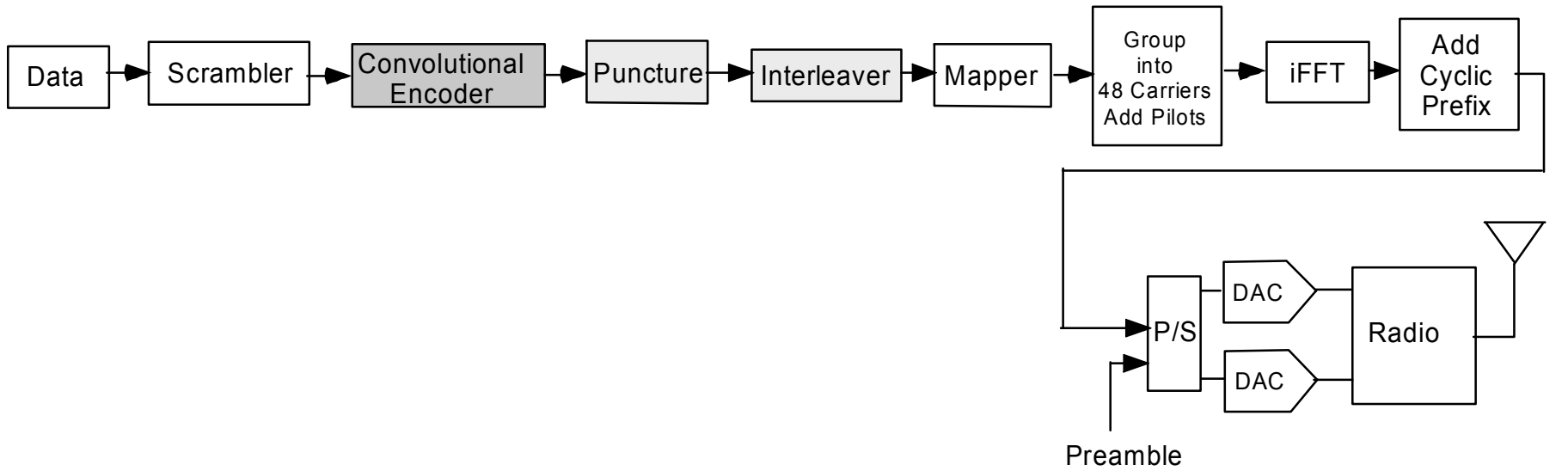
Puncturing

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.3 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is attached entitled "GNU Free Documentation License".

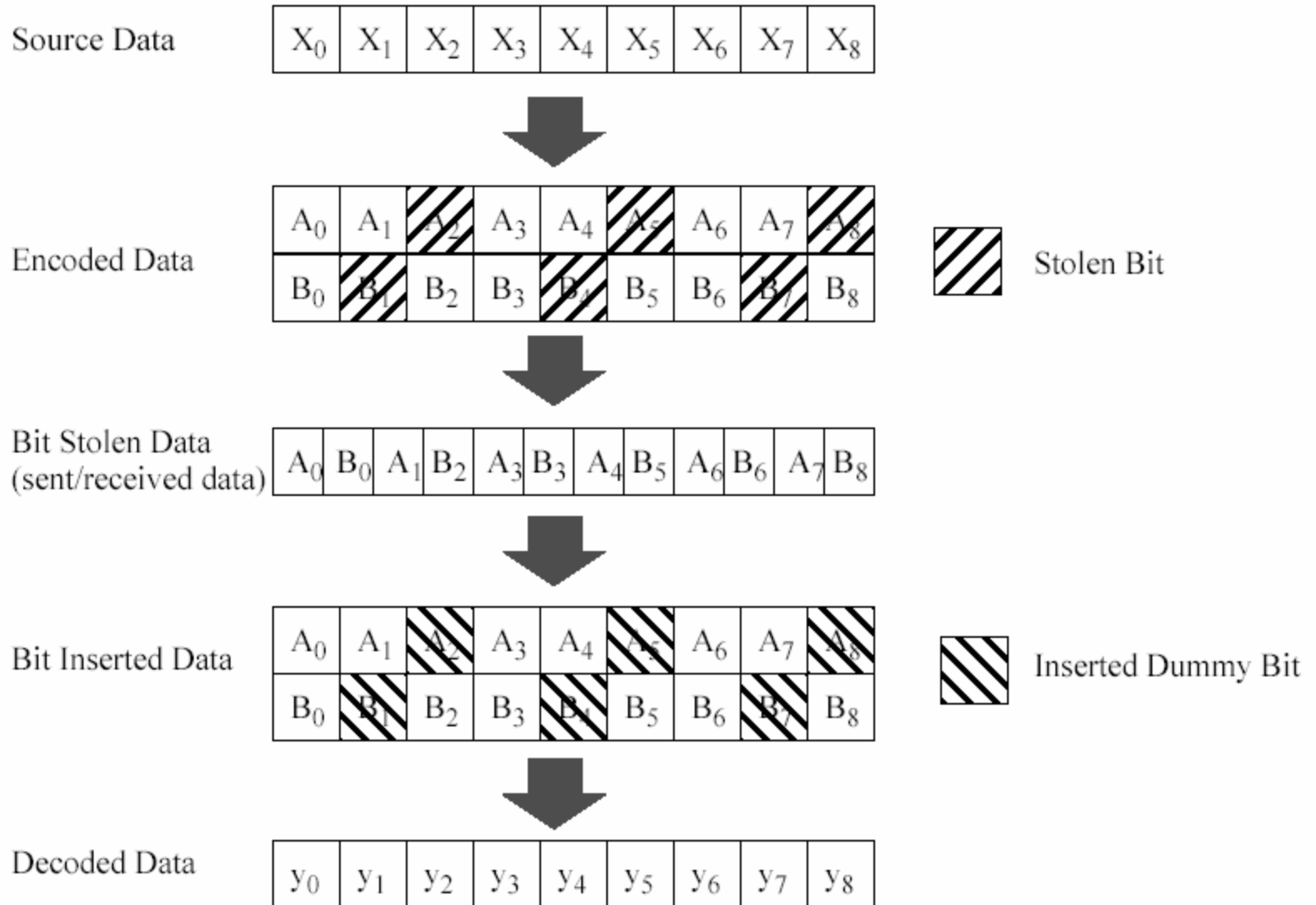


Silicon DSP Corporation

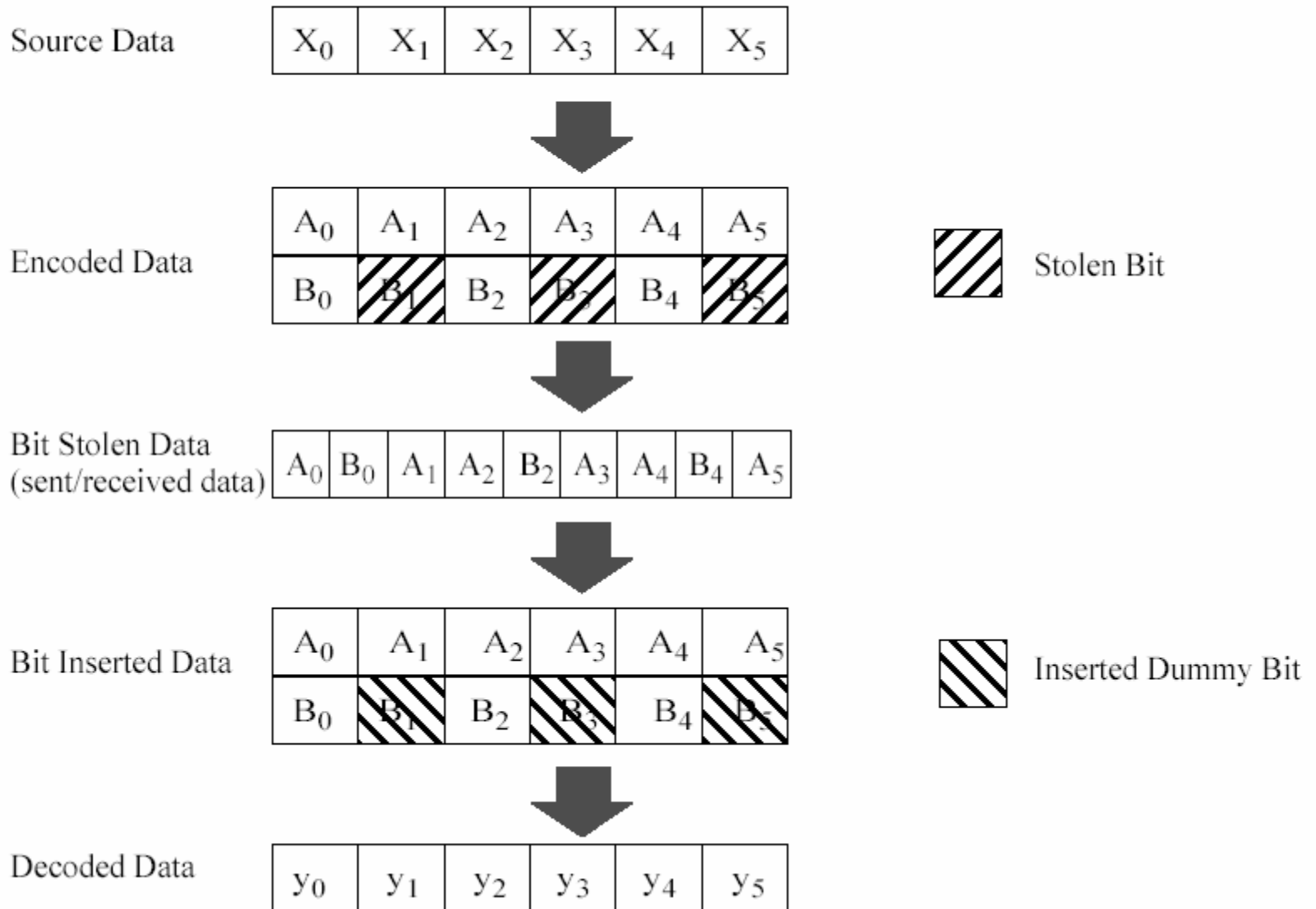
© 2007 Silicon DSP Corporation, All Rights Reserved



Punctured Coding ($r = 3/4$)



Punctured Coding ($r = 2/3$)

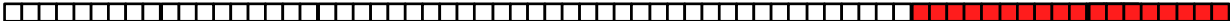
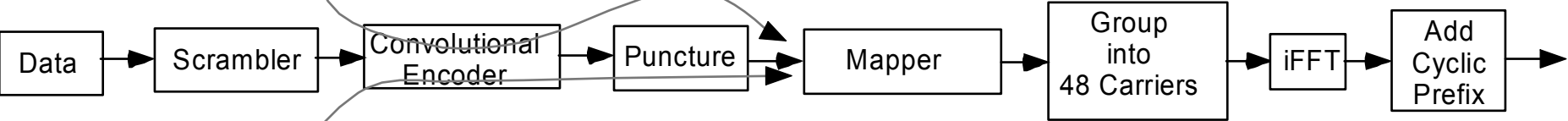


Data within OFDM Symbol no Puncturing



R_b

$R_{ce}=2R_b$



Data within OFDM Symbol with Puncturing



OFDM Symbol



Convolutional Encoder Output

101011010101100010...1101...0110110001

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

Punctured Input to Mapper

101110010100...1101...01101001
X₀ X₁ X₄₇

64 QAM

Dummy Bits Inserted
Input to Viterbi Decoder

101011000100100010...1101...0110100001



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= $288/4\mu s = 72$ Mbps

Over the Air *Data* Bit Rate= $216/4\mu s = 54$ Mbps

$$\text{Coding Rate} = 54/72 = 3/4$$

$$\text{Coding Rate} = 216/288 = 3/4$$

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