12.2

프레임 전송시간 (transmission time) $\geq$ 2 · 전파시간 (propagation time)

대역 : 20Mbps (최대전송률)   최대전파시간 $20\mu s$

a) 프레임전송시간 $40\mu s$.

b) 프레임의 최소크기   시간 × 전송률.

$$40 \cdot 10^{-6} s \times 20 \times 10^{6}\ \text{bit}/s$$

$$= 800 \text{bit}.$$

12.4

$$1010\,1010\quad 1010\,1010\quad 1010\,1010\quad 1010\,1010\quad 1010\,1010\quad 1010\,1010\,1010\,1010$$
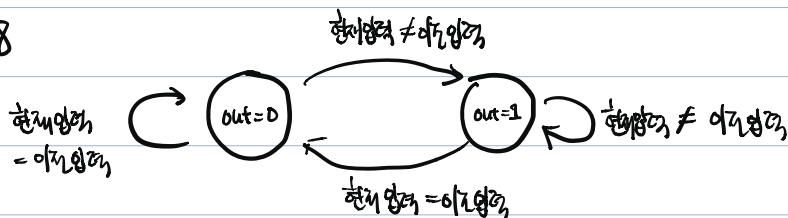
Manchester.

이것이 7번 반복된다.

12.6   8 B6T

$$\frac{6}{8} \times 33\frac{1}{3} = 25\ \text{Baud}.$$

Pure tenary $\log_2(3) = 1.585$ bit/baud. 하나의 신호값 1.585비트.

$$1.585 \times 25\ \text{Mbaud} = 39.62\ \text{Mbps}.$$

비트   속도.

12.8

12.10.

a) $B_T = A_T + B_{T-3} + B_{T-5}$

$B_0 = A_0 = 1$

$B_1 = A_1 = 0$

$B_2 = A_2 = 1$

준. $\left(XOR = \wedge \right)$

$A = 1\,0\,1\,0\,1\,0\,1\,0000\,111$

A_0 ---- A_{14}

$B_3 = A_3 \wedge B_0 = 0 \wedge 1 = 1$

$B_4 = A_4 \wedge B_1 = 1 \wedge 0 = 1$

$B_5 = A_5 \wedge B_2 \wedge B_0 = 0 \wedge 1 \wedge 1 = 0$

$B_6 = A_6 \wedge B_3 \wedge B_1 = 1 \wedge 1 \wedge 0 = 0$

$B_7 = A_7 \wedge B_4 \wedge B_2 = 0 \wedge 1 \wedge 1 = 0$

$B_8 = A_8 \wedge B_5 \wedge B_3 = 0 \wedge 0 \wedge 1 = 1$

$B_9 = A_9 \wedge B_6 \wedge B_4 = 0 \wedge 0 \wedge 1 = 1$

$B_{10} = A_{10} \wedge B_7 \wedge B_5 = 0 \wedge 0 \wedge 0 = 0$

$B_{11} = A_{11} \wedge B_8 \wedge B_6 = 0 \wedge 1 \wedge 0 = 1$

$B_{12} = A_{12} \wedge B_9 \wedge B_7 = 1 \wedge 1 \wedge 0 = 0$

$B_{13} = A_{13} \wedge B_{10} \wedge B_8 = 1 \wedge 0 \wedge 1 = 0$

$B_{14} = A_{14} \wedge B_{11} \wedge B_9 = 1 \wedge 1 \wedge 1 = 1$

b) $C_T = B_T + B_{T-3} + B_{T-5}$

$C_0 = B_0 = 1$

$C_1 = B_1 = 0$

$C_2 = B_2 = 1$

$C_3 = B_3 \wedge B_0 = 1 \wedge 1 = 0$

$$C_4 = B_4 \wedge B_1 = 1 \wedge 0 = 1$$
$$C_5 = B_5 \wedge B_2 \wedge B_0 = 0 \wedge 1 \wedge 1 = 0$$
$$C_6 = B_6 \wedge B_3 \wedge B_1 = 0 \wedge 1 \wedge 0 = 1$$
$$C_7 = B_7 \wedge B_4 \wedge B_2 = 0 \wedge 1 \wedge 1 = 0$$
$$C_8 = B_8 \wedge B_5 \wedge B_3 = 1 \wedge 0 \wedge 1 = 0$$
$$C_9 = B_9 \wedge B_6 \wedge B_4 = 1 \wedge 0 \wedge 1 = 0$$
$$C_{10} = B_{10} \wedge B_7 \wedge B_5 = 0 \wedge 0 \wedge 0 = 0$$
$$C_{11} = B_{11} \wedge B_8 \wedge B_6 = 1 \wedge 1 \wedge 0 = 0$$
$$C_{12} = B_{12} \wedge B_9 \wedge B_7 = 0 \wedge 1 \wedge 0 = 1$$
$$C_{13} = B_{13} \wedge B_{10} \wedge B_8 = 0 \wedge 0 \wedge 1 = 1$$
$$C_{14} = B_{14} \wedge B_{11} \wedge B_9 = 1 \wedge 1 \wedge 1 = 1$$